

Himachal Pradesh Technical University, Hamirpur (H.P.)



CURRICULUM ENGINEERING PROGRAM

PREAMBLE

The curriculum of an institution of higher learning is a living entity. It evolves with time; it reflects the ever changing needs of the society and keeps pace with the growing talent of the students and the faculty. The curriculum of Himachal Pradesh Technical University, Hamirpur (HPTU) is no exception. Half a century of experience in preparing graduates in engineering and postgraduates in science for a wide variety of industries has led to creation of the new curriculum. I sincerely believe that it will meet the aspirations of all stake holders – students, faculty and the employers of the graduates and postgraduates of NIT Rourkela.

In the university system the curricula and syllabi represented the upper limit of the material to be covered, the teacher having no motivation for stepping outside the defined territory. The curriculum and syllabi only serve as a guideline. The teacher enjoys freedom to expand it in any direction he feels appropriate, incorporates his latest knowledge and stimulates the creative minds of the students. He experiments with new contents and new techniques. A new teaching learning paradigm is born.

The curriculum is the culmination of the efforts of large number of faculty members and university staff and reflects their creative contribution. In keeping with the demands of the changing times, it contains many innovative features. I sincerely hope that the faculty and students will take full advantage of the dynamic features of the curriculum and make the teaching-learning process a truly sublime experience for all.

On behalf of the Senate of HP Technical University Hamirpur, I record my appreciation of the meticulous work done by the Dr.N.N. Sharma, Dean Academic in compiling the whole curricula of different programmes in this consolidated form. I also record my personal gratitude to the members of the Senate who have lent every bit of their wisdom to make the contents truly superior.



**Prof. R. L. Sharma,
Vice-Chancellor**

CONTENTS

Sr. No.	Contents	Page No.
A	Philosophy of Curriculum	1-6
B	Curriculum(1 st and 2 nd Semester)and Detailed Syllabi(1 st and 2 nd Semester) of B.Tech(Common for all Branch)	7-46
C	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Civil Engineering	47-94
D	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Computer Science & Engineering	95-143
E	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Information Technology	144-190
F	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Electronics and Communication Engineering	191-241
G	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Electrical Engineering	242-290
H	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Mechanical Engineering	291-339
I	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Textile Engineering	340-390
J	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Automobile Engineering	391-439
K	Curriculum(3 rd to 8 th Semester)and Detailed Syllabi(3 rd to 4 th Semester) of B.Tech Electrical and Electronics Engineering	440-483

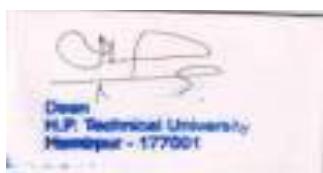
A. PHILOSOPHY OF CURRICULUM

1. Introduction

The Indian Higher Education Institutions (HEI's) are changing from the conventional course structure to Choice Based Credit System (CBCS). The choice based credit system enables vertical and horizontal mobility in learning and provides a "cafeteria" type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning.

The CBCS facilitates transfer of credits earned in different departments / centers of other recognized / accredited universities or institutions of higher education in India and abroad either by studying directly or by online method. The curriculum of every programme is designed accordingly and strikes a judicious balance between the need for formal instruction and free time to think beyond the course work.

The undergraduate curriculum of HPTU Hamirpur has strived to offer both theory courses as well as laboratory and design practice in all major areas of study. It has, however, consciously avoided combining theory and laboratory classes in the same course (e.g. L-T-P = 3-0-2). It was felt that an inflexible combination of theory and laboratory components will limit the opportunity to study a wide variety of subjects and increase failure rate. Therefore, separate courses are offered for theory and laboratory components in the form of (3-0-0) or (3-1-0) theory courses and (0-0-2) laboratory courses. In order to make the time table simple and easily implementable, the variety of courses are limited to only three types – (3-0-0) 3 credits, (3-1-0) 4 credits, (2-2-0) 3 credits and (0-0-2) 1 credit. Finally split subjects, carrying one or two credits, and super



heavy courses carrying 4 credits or more, have been consciously avoided to ensure easy and convenient implementation.

2. Credit System

The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. In a credit system, One Credit refers to:

- One lecture hour/week/Semester for Theory Courses; and,
- Two hours/week/Semester for Lab/Practical Courses or Tutorials, and
- Four hours/ week/ Semester for project work.

Other student activities not demanding intellectual work or enabling proper assessment namely study tour and guest lecture, etc. do not carry any credits.

3. Course Structure and Credit Assignment

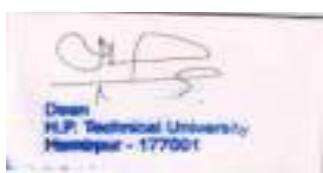
A typical course comprises of lectures, tutorials, practical or design practice. As stated above, separate courses are proposed for theory and laboratory. Three type of courses are proposed to be offered – (3-0-0) 3 credits, (3-1-0) 4 credits, (2-2-0) 3 credits and (0-0-2) 1 credit.

The credits assigned for different components of a course are given below in Table 1.

Table 1: Credit Values for Different Components of a Subject

Lectures (hrs/wk/Sem.)	Tutorials (hrs/wk/Sem.)	Practical Work (hrs/wk/Sem.)	Credits (L: T: P/D)	Total Credits
3	0	0	3:0:0	3
2	2	0	2:1:0	3
2	0	2	2:0:1	3
2	2	2	2:1:1	4
0	0	6	0:0:3	3

4. Course Load



Every student has to register for a set of courses in each semester, with the total number of their credits being limited by considering the permissible weekly contact hours (typically: 30/Week); For this, an average course load of 24 credits/semester (e.g., 6-7 subjects) is considered acceptable. A typical course load per semester is given in Table. (2).

Table 2: Typical Course Load in a Semester

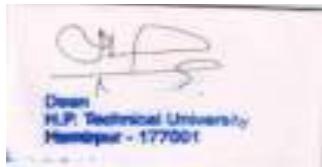
No. of Courses	Credits/Course	Total Credits	Contact Hours/Week *
Two Lecture Courses	3:0:0	6	6
Two Lecture Courses	2:2:0	6	6
Two Lec + Tut Courses	3:1:0	8	10
One Elective Course	3:0:0	3	3
Two Lab Course	0:0:2	2	4
One Mandatory Course	0:0:3	2	3
Total Courses: Six + one	17:3:2	24+3	+ 30

* Widely accepted figure ~ 30 hours/week, to enable the students to engage in homework assignments, self-learning outside the Class rooms/Laboratories, Extra/Co-Curricular activities and add-on courses, if any, for their overall development.

5. Categorization of Courses

The curriculum of all the programmes has been broadly be classified into following categories:

(i)**Foundation Courses (FC):** The Foundation courses, is a set of compulsory courses required to be taken by every student in the program. These courses prepare a student for further study and focuses on the academic skills required for further study. The courses comprises of introductory modules in applied mathematics, basic sciences, engineering Sciences, humanities and social sciences and skill based courses.



(ii) **Program Core (PC):** The program core builds the best possible foundation in the chosen program, helping the students to develop the ability to think analytically, read critically, and write effectively. The program courses include Inter-disciplinary courses and the students shall study all such courses through regular mode.

(iii) **Elective Core:** Electives provide breadth of experience in respective branch and applications areas. Elective course is a course which can be chosen from a pool of courses. It may be:

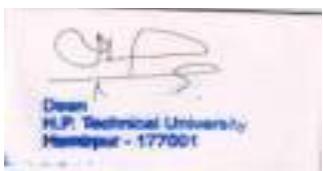
- Supportive to the discipline of study
- Providing an expanded scope
- Enabling an exposure to some other discipline/domain
- Nurturing student's proficiency/skill.

An elective may be discipline centric (Programme Elective) focusing on those courses which add generic proficiency to the students or may be chosen from an unrelated discipline called as Open Elective.

For example, in B.Techprogramme, there are four professional elective groups; a student can choose not more than one course from each group. Overall, a student can opt for four professional elective courses which suit his/her project work in consultation with the faculty advisor/mentor. Nevertheless, two programme electives have to be selected.

Similarly, there are three open elective groups in the B.Techprogramme; a student can choose not more than one course from each group. Overall, a student can to opt for three professional electives depending upon his/her interest. Nevertheless, one open elective out of the three is mandatory.

(iv) **Mandatory Courses (MC):** Mandatory courses are essentially ability and skill enhancement courses. The ability enhancement courses are wherein familiarity is considered mandatory and are recommended by the regulatory bodies such as



AICTE, UGC, etc. Environmental Science, English/Communication, etc. are such courses and are mandatory for all programmes. The skill based or value-based courses on the other hand are aimed at providing hands-on-training and professional competencies to a student.

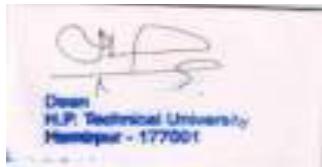
- (v) **Audit Courses (AC):**Audit courses are the courses offered to supplement the students' knowledge/ skills prescribed outside the range of credits.

Foundation courses shall mainly be taught during the first year of study. Limited amount of choice shall be available to departments and to students in choosing the subjects of first year.

The list of elective courses may include subjects from allied disciplines also. The course distribution will be subject to certain beneficial constraints. Sufficient open electives shall be from the area of Humanities and Social Sciences.

It is essential that the students acquire the necessary writing and presentation skills, become proficient in massive computational and data handling capacity of modern day computers (hardware and software) and related devices and develop interest in undergraduate research. In order to cater to this need, courses to enhance students Communication Skills and use of Computers and Modern Educational Technology Tools (which include MATLAB, simulation software etc.) be included as mandatory courses in all programmes.

Summer industrial training being a part of engineering education for a long time, summer internship either in industry or in an R&D organization, including educational institutes with excellent research culture must be introduced. A student must take a summer internship of minimum four weeks after fourth and/ or sixth semester. The student should have the option of choosing his/her own industry/area of interest, which may be related to their respective branch or any other service oriented task. The student is expected to



submit a formal report at the end of the programme and shall be evaluated during the subsequent semester.

Seminar is introduced in the curriculum to allow students exposure to variety of topics through the medium of attending seminars. The students shall not only be expected to present seminars; they will attend seminars presented by others as per recommendation of the teacher. These will include seminars by faculty and research students in the department and by invited experts in the same or related departments. In a semester, a student shall be required to attend 6 – 8 seminars and write 2 scientific (including popular science) articles or posters. The articles and posters will be on display in departmental libraries, web sites or in any other media for public benefit.

Project work preferably be split into two parts as Project- I and Project - II wherever possible to put greater emphasis on Undergraduate Research. A student has a choice of taking a full semester Research or Industrial Project during the last semester in which he/she is required to demonstrate his/her ability to learn current areas of research and/or industrial interest. The Research or Industrial Project shall be carried out in an identified industry / firm / organization as per the stipulated guidelines of that industry/firm/organization and the University/ Institute.

- 8. Sequencing of Courses:** The courses that need to be completed successfully by a student are spread over eight semesters. The adopted plan and sequencing of courses is given in Table (3). Seventh and eighth semesters have relatively lesser number of courses to allow students to take full semester research project/internship and plan for future.

Table (3): Typical Sequencing Plan for Courses:

Semester	Subject Area Coverage
I & II	Foundation and Mandatory courses common for all branches.
III & IV	Foundation courses and Mandatory courses if required common for all branches to be continued; Program courses in two/three groups - area wise orientation and Open electives.
V & VII	Program courses, Program elective and Open elective courses; Branch-wise Orientation; Seminar.
VIII	Program electives, Project work and Internship.



B. CURRICULUM OF B.TECH DEGREE PROGRAMME

SEMESTER –I (COMMON TO ALL BRANCHES)

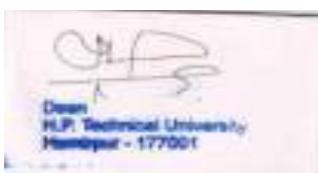
S. N	Category	Paper Code	Subject	L	T	P/D	Credits	Evaluation Scheme (Marks)					
								Internal Assessment (IA)			ESE		
								CT	TA	Total			
Theory:													
1	MC	HS-101	English Communication Skills	2	-	-	2	20	20	40	60	100	
2	FC	MA-101	Engineering Math –I	3	1	-	4	20	20	40	60	100	
3	FC	PH-101/ CH -101	Engineering Physics/ Engineering Chemistry	3	1	-	4	20	20	40	60	100	
4	FC	ME-101/ EE -101	Engineering Mechanics/ Principles of Electrical Engg.	2	2	-	3	20	20	40	60	100	
5	FC	CS -101/ EC -101	Computer Fundamentals and Programming in C++/ Fundamentals of Electronics Engg.	2	2	-	3	20	20	40	60	100	
6	MC	ME-102/ ME -103	Engineering Drawing & Graphics/ Workshop Technology	2	-	3	3	20	40	60	40	100	
7	MC	HS-102/ HS- 103	Environmental Science/ Disaster Management	2	-	-	2	20	20	40	60	100	
	Labs:								FW	LP	Total	ESVE	Sub. Total
1	MC/FC	HS -111/ EE- 111	Communication Lab/ Electrical Engg. Lab	-	-	2	1	10	20	30	20	50	
2	FC	PH-111/ CH-111	Engineering Physics Lab/ Engineering Chemistry Lab	-	-	2	1	10	20	30	20	50	
3	FC	CS -111/ EC- 111	Computer Programming Lab/ Electronics Engg. Lab	-	-	2	1	10	20	30	20	50	
			Total	16	6	09	24						

Legend: L - Lecture
 T - Tutorial
 P - Practical
 CT - Class Test
 IA - Internal Assessment

ESE - End Semester Examination
 FW - Documentation/ File work and presentation
 LP - Lab performance
 ESVE - End Semester Exam./ viva-voce Exam.

Note: **Group A:**
 Branches: Civil Engg., Inf. Technology, Computer Science &Engg. and Electronics & Comm. Engg.
 Subjects: HS-101, MA-101, PH-101, ME-101, CS-101, ME-102, HS-102, HS- 111, PH-111, CS-111

Group B:
 Branches: Mech. Engg., Automobile, Textile, Electrical Enggand Electrical and Electronics Engg.
 Subjects HS-101, MA-101, CH-101, EE-101, EC-101, ME-103, HS-103, EE- 111, CH-111, EC-111



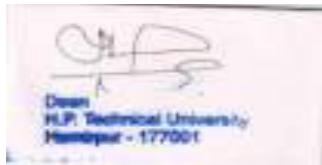
SEMESTER – II (COMMON TO ALL BRANCHES)

S. N.	Category	Paper Code	Subject	L	T	P/D	Credits	Evaluation Scheme (Marks)				
								Internal Assessment (IA)			ESE	
								CT	TA	Total		
Theory:												
1	MC	HS -204	Business Communication	2	-	-	2	20	20	40	60	100
2	FC	MA -202	Engineering Math -II	3	1	-	4	20	20	40	60	100
3	FC	CH-101/ PH-101	Engineering Chemistry/ Engineering Physics	3	1	-	4	20	20	40	60	100
4	FC	EE -101/ ME-101	Principles of Electrical Engg. /Engineering Mechanics	2	2	-	3	20	20	40	60	100
5	FC	EC -101/ CS -101	Fundamentals of Electronics Engg./ Introduction to Computer Fundamentals and Programming in C++	2	2	-	3	20	20	40	60	100
6	FC	ME-103/ ME-102	Workshop Technology/ Engineering Drawing & Graphics	2	-	3	3	20	40	60	40	100
7	MC	HS-103/ HS- 102	Disaster Management / Environmental Science	2	-	-	2	20	20	40	60	100
	Labs:								FW	LP	Total	ESVE
												Sub. Total
1	FC/ MC	EE- 111/ HS -111/	Electrical Engg. Lab/ Communication Lab	-	-	2	1	10	20	30	20	50
2	FC	CH-111/ PH -111	Engineering Chemistry Lab/ Engineering Physics Lab	-	-	2	1	10	20	30	20	50
3	FC	EC -111/ CS- 111	Electronics Engg. Lab/ Computer Programming Lab	-	-	2	1	10	20	30	20	50
			Total	16	06	09	24					

Legend: L - Lecture ESE - End Semester Examination
 T - Tutorial FW - Documentation/ File work and presentation
 P - Practical LP - Lab performance
 CT - Class Test ESVE - End Semester Exam./ viva-voce Exam.
 IA - Internal Assessment

Note: **Group A:**
 Branches: Civil Engg., Inf. Technology, Computer Science &Engg. and Electronics & Comm. Engg.
 Subjects HS-204, MA-202, CH-101, EE-101, EC-101, ME-103, HS-103, EE- 111, CH-111, EC-111

Group B:
 Branches: Mech. Engg., Automobile, Textile, Electrical Enggand Electrical and Electronics Engg.
 Subjects: HS-204, MA-202, PH-101, ME-101, CS-101, ME-102, HS- 102, HS- 111, PH-111, CS-111



SEMESTER-I
HS-101: ENGLISH COMMUNICATION SKILLS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

Unit-I

Communication: Need for effective communication, process of communication, The Seven Cs of Effective Communication - Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness; Barriers to communication - miscommunication, physical noise; Overcoming measures.

Unit-II

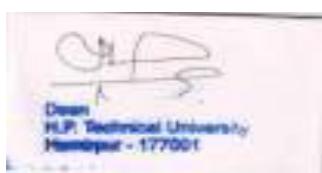
Essentials of Gramar: Sentence structure; Sentence formation, Use of appropriate diction, Tenses, articles and prepositions; English Phonetics: International phonetic alphabets - Production of sounds, Classification of consonant and vowel sounds.

Unit-III

Writing Skills: Letter writing - Formal, informal and demi-official letters; Business letters - quotations, supply orders, complaints, sales, adjustment letters, etc.; Resume writing: Difference between bio-data, CV and resume, Cover letter, Application for job.

Unit-IV

Soft skills: Classification of soft skills, soft skills for personality development & career growth; Capturing audience, Tone, Behavior and telephone etiquette - Good practice when making and receiving a call; Becoming a good leader and team-player, Personal SWOT analysis.

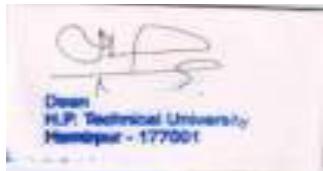


Text Books:

1. Herta A. Murphy, et al., *Effective Business Communication*, Tata Mc-Graw Hill: New Delhi
2. Krishna Mohan and Meenakshi Raman, Effective English Communication, TMH
3. B. K. Mitra, Personality and Soft Skills, Oxford press.

Reference Books:

1. R.W. Lesikar and John.D. Pettit, *Business Communication: Theory and Application*, All India Traveller Bookseller.
2. Francis Soundaraj, *Speaking and Writing for Effective Business Communication*, Macmillan.
3. Ronald B. Adler and George Rodman, *Understanding Human Communication*, Oxford University Press: New York.



MA-101: ENGINEERING MATHEMATIC-I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT I

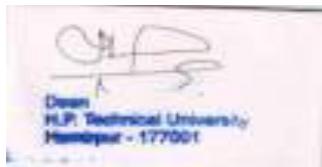
Linear Algebra: Review of Matrices; Linearly dependent / independent of vectors; Rank and MatrixInverse; Linear Transformation & Matrix Representation; System of Linear Equations, Eigenvalues and Eigenvectors; properties of Eigenvalues, Diagonalization of Matrices; Jordan Canonical Form, Cayley Hamilton Theorem.

UNIT II

Complex Numbers: Roots of complex number, Real and imaginary parts of functions of a complex variables - Exponential, Circular, Hyperbolic, Logarithmic and Inverse hyperbolic functions; Summation of the series $C + iS$; Limit and derivative of complex functions, Cauchy - Riemann equations, Analytic functions, Entire functions and its applications.

UNIT III

Differential Calculus: Leibnitz theorem, Partial derivatives, Euler's theorem for homogenous function, Total derivative, Change of variable; Taylor's and Maclaurin's series, Jacobian, Extrema of function of two variables, Method of undetermined multipliers.



Multiple Integrals: Double and triple integrals and their applications, Change of order of integration, Change of variables. Application of multiple integral to surface area and volume, Beta and Gamma functions and their relationships.

UNIT IV

Vector Differentiation: Scalar and vector point functions, Gradient of a scalar field, Directional derivative, Divergence and Curl of a vector field, Laplacian and second order operators.

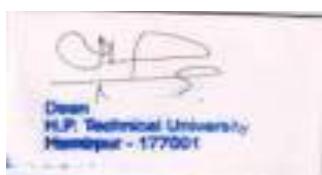
Vector Integration: Line, surface and volume integrals; Vector integral theorems: Greens, Stokes and Gauss divergence theorems (Without proof) and related problems.

Text Books:

1. Kreyszig E., Advanced Engineering Mathematics, Wiley ,9th edition.
2. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers

Reference Books:

1. Engineering Mathematics - H.K. Dass and Rama Verma, S. Chand Publications
2. Engineering Mathematics - N.P. Bali and Manish Goel, Laxmi Publications
3. Engineering Mathematics - D. Kandu, Neel Kamal Prakashan
4. Higher Engineering Mathematics - B.V. Ramana, Tata McGraw Hill Education Pvt. Ltd., New Delhi



PH-101: ENGINEERING PHYSICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT I

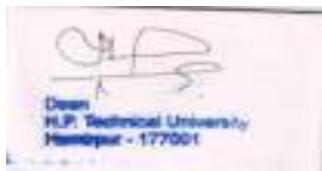
Theory of Relativity:- Inertial and non- inertial frames of reference, earth as an inertial frame of reference, Michelson and Morley experiment, Postulates of special theory of relativity, Galilean and Lorentz transformations, Time dilation and length contraction, Relativistic kinematics and mass-energy equivalence.

Laser: Introduction, Characteristics of lasers, Spontaneous and stimulated emission of radiation Einstein's coefficients, Population inversion, Ruby laser, Helium -Neon lasers, Applications of laser in industry, Scientific and medical fields.

UNIT II

Oscillations: Simple harmonic motion (SHM), Differential equation of SHM, Energy of SHM, Damped and Forced Oscillations, Relaxation Time, Quality Factor, Resonance, Sharpness of Resonance.

Fibre Optics: Fundamental ideas about optical fibre, Propagation mechanism, Acceptance angle and acceptance cone, Numerical aperture, Propagation Mechanism and communication in fiber, Single and Multi-Mode Fibers, Step index and Graded index fiber, Attenuation and losses, Applications of optical fibres.



UNIT III

Quantum Mechanics: De Broglie waves, Phase and Group velocity concept, Uncertainty principle and its application, Wave function, Postulates of quantum mechanics, Derivation of Schrodinger equation for time independent and time dependent cases., Particle in one dimensional box, Potential well, Simple harmonic oscillator (one dimensional and three dimensional).

X-rays: X-rays production, hard and soft x-rays, Continuous and characteristics x-rays, Bremsstrahlung effect.

UNIT IV

Electromagnetic Waves: Maxwell's equations, Wave equation, Plane electromagnetic waves, Longitudinal and transverse waves, Superposition, Wave packets, Two and three dimensional waves, Energy - momentum, Poynting's theorem, Electromagnetic boundary conditions.

Superconductivity: Introduction and discovery of superconductivity, Meissner effect, Type-I and type-II superconductors, Isotope effect, BCS theory (qualitative), High temperature superconductors, Applications of superconductivity.

Text Books:

1. Applied Solid State Physics; Wiley India Pvt Ltd.
2. Quantum Mechanics: Theory and Applications- Ajoy Ghatak, Tata McGraw-Hill.
3. Engineering Physics; Satya Prakash and Vibhav Saluja, Pragti Prakashan Meerut.
4. Modern Engineering Physics; A.S. Vasudeva, S. Chand & Co. Ltd.

Reference Books:

1. Optics- Ajoy Ghatak, Tata McGraw-Hill.
2. Optics- N. Subrahmanyam, Brij Lal, M.N. Avadhanulu, S. Chand & Co. Ltd.
3. Fiber optics and laser Principles and Applications- Anuradha De, New Age International.
4. Concepts of Modern Physics-Arthur Beiser, Tata McGraw-Hill.
5. Introduction to electrodynamics; David J Griffiths, Prentice Hall of India, New Delhi.



ME-101: ENGINEERING MECHANICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT- I

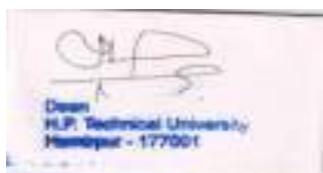
Introduction to engineering mechanics: Basic concepts, Laws of motion, Principle of Transmissibility of forces; Resultants of force system: Parallelogram law, Forces and components, Resultant of coplanar concurrent forces, Components of forces in space; Moment of force - Principle of moment, Coplanar applications, Couple, Resultant of any force system.

Equilibrium of Rigid Bodies: Free body diagram, Types of supports, Equations of equilibrium, Stable equilibrium, Moments and couples, Moment of a force about a point and about an axis, Equilibrium of planer and spacial rigid body systems.

UNIT- II

Friction: Introduction, Theory of friction, Angle of friction, Laws of friction, Static and dynamic friction, Motion of bodies: Angle of repose, Angle of friction, Cone of friction, Motion on inclined rough surface, Lifting Machines: Wedge, Screw, Screw-Jack and Differential screw jack.

Centroid and Moment of Inertia: Centroid of plane, curve, area, volume and composite bodies, Moment of inertia of plane area, Parallel Axes Theorem, Perpendicular axes theorems, Principal Moment Inertia, Mass Moment of Inertia of Circular Ring, Disc, Cylinder, Sphere and Cone about their Axis of Symmetry.



UNIT -III

Structural Analysis: Plane Truss, Space Truss, Difference between truss and frame, Types of truss-Perect, Redundant, Deficient, Analysis of plane truss – Method of sections, Method of joints, Graphical method.

Beams: Types of beams, Statically determinate beams, Shear Force and Bending Moment in beams, Shear Force and Bending Moment diagram, Relationship between Shear Force and Bending Moment.

UNIT -IV

Kinematics of Rigid body: Introduction, Plane Motion of Rigid Body - Rectilinear and curvilinear translation, fixed axis rotation and general plane motion; Relative Velocity; Problems.

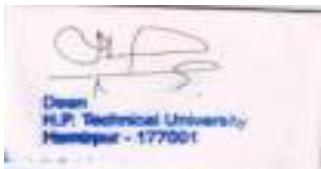
Kinetics of Rigid Body: Introduction, Force, Mass and Acceleration, Equations of motion, Work and Energy, Impulse and Momentum, D'Alembert's Principles and Dynamic Equilibrium; Problems.

Text Books:

1. "Engineering Mechanics", K.L. Kumar, Tata McGraw Hill
2. "Engineering Mechanics ", Timoshenko & Young , 4th ed, Tata McGraw Hil

Reference Books:

1. "Engineering Mechanics : Statics and Dynamics", Shames and Rao, Pearson.
2. Vector Mechanics for Engineers: by Beer & Johnston, Tata McGrawHill
3. Statics and Dynamics : by Meriam, John Wiley & Sons.
4. "Statics and Dynamics", by R.C Hibbler, Pearson



CS -101: COMPUTER FUNDAMENTALS AND PROGRAMMING IN C++

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT I – Computer Fundamentals

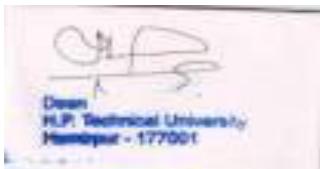
Evolution of computers; Basics of computer and its operation; Functional Components and their interconnections, Concept of Booting. Classification of Computers.

Programming Languages: Machine Language, Assembly Language and High Level Language; Software Concepts: Types of Software - System Software, Utility Software and Application Software; System Software: Complier, Interpreter and Assembler; Need and Functions of Operating System.

UNIT II – Number System, Codes and Memories

Binary, Octal, Decimal and Hexadecimal Number System and their Inter Conversion; BCD and ASCII Codes; Processor Clock Speed (MHz, GHz), 16 bit, 32 bit and 64 bit processors.

Storage Units: Byte, Kilo Byte, Mega Byte, Giga Byte, Tera Byte, etc.; Memory Types: Cache; RAM, ROM; Secondary Memory –Internal and External storage.



UNIT III – Introduction to C++

C++ character set, C++ Tokens (Identifiers, Keywords, Constants, Operators,), Structure of a C++ Program (include files, main function), Header files - iostream.h, iomanip.h, cout, cin; use of I/O operators (<<and>>), Use of endl and setw (), Cascading of I/O operators, Error Messages; Use of editor, basic commands of editor, compilation, linking and execution.

Concept of Data types; Built-in Data types: char, int, float and double; Constants: Integer Constants, Character constants - \n, \t, \b, Floating Point Constants, String Constants; Access modifier: const; Variables of built-in-data types, Declaration/Initialization of variables, Assignment statement, Type modifier: signed, unsigned, long Operator and Expressions: Operators: Arithmetic operators (-,+,*,/,%), Unary operator (-), Increment (++) and Decrement (--) Operators, Relation operator (>,>=,<=,!=), Logical operators (!,&&,||), Conditional operator: <condition>?<if false>; Precedence of Operators; Automatic type conversion in expressions, Type casting; C++ shorthands (+=-, *=, /=, %=) .

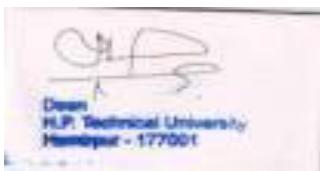
UNIT IV - Programming in C++

Conditional statements: if else, Nested if, switch..case..default, use of conditional operator, Nested switch..case, break statement; Loops: while, do - while, for and Nested loops.

Defining a function; function prototype, Invoking/calling a function, passing arguments to function, specifying argument data types, default argument, constant argument, call by value, call by reference, returning values from a function, calling functions with arrays, scope rules of functions and variables local and global variables.

Introduction to Array and its advantages; One Dimensional Array: Declaration/initialization of One-dimensional array, inputting array elements, accessing array elements, manipulation of array elements (sum of elements, product of elements, average of elements, linear search, finding maximum/minimum value) Declaration / Initialization of a String, string manipulations (counting vowels/ consonants/ digits/ special characters, case conversion, reversing a string, reversing each word of a string); Two-dimensional Array: Declaration/initialization of a two-dimensional array, inputting array elements accessing array elements, manipulation of array elements (sum of row element, column elements, diagonal elements, finding maximum / minimum values).

Defining a Structure (Keyword Structure), declaring structure variables, accessing structure elements, passing structure to functions as value and reference argument/parameter, function returning structure array of structure, passing an array of structure as an argument/ a parameter to a function.



TEXT BOOKS:

1. B. Gottfried, “*Schaum's Programming with C*,” Tata McGraw-Hill.
2. J. Hubbard, “*Schaum's Outline of Programming with C++*” Tata McGraw-Hill.
3. E. Balaguruswamy, “*Programming in ANSI C*,” Tata McGraw-Hill.
4. Y. Kanetkar, “*Let us C*,” BPB Publications.
5. S. Lipschutz, “*Data Structures, Schaum's Outlines Series*,” Tata McGraw-Hill.

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, “*The C Programming Language*,” Prentice Hall of India.
2. Ellis Horowitz, Satraj Sahni and Susan Anderson-Freed, “*Fundamentals of Data Structures in C*,” W. H. Freeman and Company.
3. Operating System Concepts, (6th Edition), by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne.



ME-102: ENGINEERING DRAWING & GRAPHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
1	0	5	3	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

Unit-I

Introduction and Engineering Graphics: Drawing instruments, Introduction to IS code of drawing, Freehand lettering (upper case & lowercase); Construction of conics sections by eccentricity method; Construction of Cycloids, Involutes, Spirals and Helix; Scales: Plain, Diagonal and Vernier Scales; Dimensioning.

Orthographic Projection of Lines and Planes: Projections of points in different quadrants; Projections of straight lines inclined to one or both of the reference planes; True length and inclination of lines with reference planes; Traces of lines.

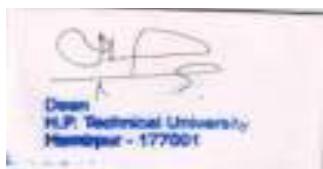
Unit-II

Orthographic Projection of Solids: Projections of simple solids in simple positions, axis inclined to one of the reference planes and axis inclined to both the reference planes-use change of position method OR auxiliary projection method.

Sections of Solids: Sections of simple solids in simple vertical positions with section plane perpendicular/inclined to one of the reference planes – True shapes of sections.

Unit-III

Isometric Projections: Isometric projections and views of simple and truncated simple solids, sphere, hemisphere and their combinations in simple position. Conversion of Pictorial views to Orthographic views by free hand sketching.



Sections of Solids: Sections and sectional views of right angular solids - Prism, Cylinder, Pyramid and Cone.

Unit-IV

Development of Surfaces: Development of surfaces of simple and cut regular solids - Prism, Pyramid, Cylinder and Cone.

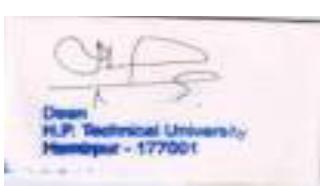
Intersection of surfaces: Intersection of prism in prism & cylinder in cylinder- axis bisecting at rightangles only.

Text Books

1. Engineering Drawing by N.D. Bhatt.
2. Engineering Graphics by P.S. Gill.

Reference Books:

1. Engineering Drawing and Computer Graphics -Shah, M.B. & B.C. Rana, Pearson Education, 2008
2. Engineering Drawing Practice for schools and colleges, Bureau of Indian Standards, New Delhi.



HS-102: ENVIRONMENTAL SCIENCE

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT I

Introduction: Multidisciplinary nature of environmental studies, Scope and Importance; Natural Resources - Renewable and non-renewable resources; Forest resources - Use and over-exploitation, deforestation; Water resources - Use and over-utilization, floods, drought, conflicts over water; Mineral resources - Use and exploitation; Food resources - World food problem, effects of modern agriculture; Energy resources - Growing energy needs, renewable and non-renewable energy sources.

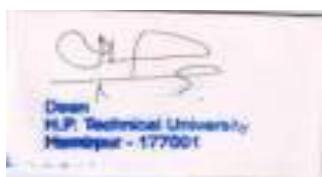
UNIT II

Ecosystems: Structure and function of an ecosystem - ecological succession - primary and secondary succession - ecological pyramids - pyramid of number, pyramid of energy and pyramid of biomass.

Biodiversity: Introduction - Genetic, species and ecosystem diversity, Value of biodiversity - consumptive use, productive use, social, ethical and aesthetic values, Biodiversity at global, national and local levels; Threats to biodiversity - habitat loss, endangered and endemic species of India.

UNIT III

Environmental Protection: National concern for environment: Important environmental protection acts in India - water, air (prevention and control of pollution) act, wild life conservation and forest act - functions of central and state pollution control boards - international effort - key initiatives of Rio declaration, Vienna convention, Kyoto protocol and Johannesburg summit.



UNIT IV

Chemical Toxicology: Toxic Elements in Water, Pesticides in Water, Impact of Toxic Chemicals on Enzymes.

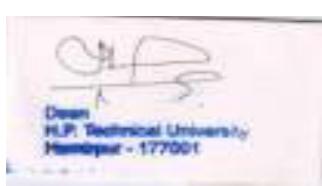
Waste Management: Waste water treatment (general)—primary, secondary and tertiary stages; Solidwaste management: sources and effects of municipal waste, bio medical waste - process of waste management.

Text Books:

1. Environmental Studies - J Krishnawamy, R J Ranjit Daniels, Wiley India.
2. Environmental Science - Bernard J. Nebel, Richard T. Right, Prentice Hall.

References Books:

1. Environment and Ecology - R K Khandal, Wiley India.
2. Environmental Science – 8th edition ISV, Botkin and Keller, Wiley India.
3. Environmental Studies - Soli. J Arceivala, Shyam, R Asolekar, McGrawHill India, 2012.
4. Environmental Studies - D.L. Manjunath, Pearson Education India, 2007.



CH-101: ENGINEERING CHEMISTRY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

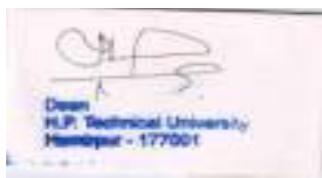
UNIT - I

Water Treatment: Introduction, Sources of water, Common Impurities in water, Hardness of water & its determination by EDTA method, Alkalinity of water, BOD & COD; Hardness of water, Disadvantages of hard water, sludge and scale formation in boilers and its prevention, Techniques of water softening (Zeolite process and ion exchange process). Principles and processes used in domestic water purifiers.

Electrochemistry: Introduction to electrochemistry, Electrodes—reference electrodes, Glass electrode(pH determination), Nernst equation—derivation and applications; Storage devices—lead-acid, Ni-Cd, Li-ion batteries, Hydrogen-oxygen Fuel Cell and Solar Cell.

UNIT – II

Corrosion: Introduction, types of corrosion (dry and wet corrosion), theory of corrosion, types of electrochemical corrosion (galvanic, pitting, differential aeration and stress corrosion), Factors influencing corrosion and Prevention of corrosion.



Spectroscopy: UV-Vis: Principle, instrumentation, Lambert-Beer's Law, electronic transitions, auxochrome, chromophore, effect of conjugation and solvent on transition of organic molecules, applications.

IR: Principle, instrumentation, Fundamental vibrations, Hooke's Law, effect of masses of atoms, bond strength, nature of substituent and hydrogen bonding on IR frequency, applications.

XRD: Basic principle and applications

UNIT – III

Fuels and Combustion: Introduction, classification of fuels (Solid, Liquid and Gases), Analysis of Coal(Proximate and Ultimate), Petroleum fuels, Cracking, Reforming, Octane no, Cetane no, Gaseous fuel – Water gas, producer gas.

Lubricants: Principle of Lubrication, Mechanism of Lubrication, Types and selection of lubricants, Properties of Lubricants.

UNIT – IV

Polymers: Introduction, Types of polymers, Thermoplastic and Thermosetting resins (Synthesis and applications of Bakelite, epoxy resin, Urea formaldehyde, teflon, PMMA, PVC, Polyurethane), Natural and synthetic rubbers, Fibres, Conducting & biodegradable polymers and their applications.

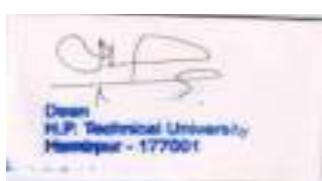
Nano Materials: Introduction, Preparation, Properties of nanomaterials, Graphene, Graphite, Fullerenes, Carbon nano-tubes, nano-wires, nano-cones, Application of nano-materials.

Text Books:

1. Engineering Chemistry, Wiley India
2. Physical Chemistry - Gordon M. Barrow; McGraw Hill

References Books:

1. A Text Book of Engineering Chemistry, Shashi Chawala, 2013, Dhanpat Rai & Co.
2. Physical Chemistry-Peter Atkin, W.H. Freeman Publishers.



EE -101: PRINCIPLES OF ELECTRICAL ENGG

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT I

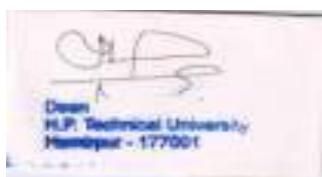
Introduction: Sources of energy; General structure of electrical power systems, Power transmission and distribution via overhead lines and underground cables, Steam, Hydel, and Nuclear power generation.

D C Circuits and Network Theorems: Circuit Concepts - Concepts of network, Active and passive elements, Voltage and current sources, Concept of linearity and linear network, Unilateral and bilateral elements - R, L and C as linear elements, Source transformation Kirchhoff's laws; Loop and nodal methods of analysis; Delta-star and star-delta conversion; Network theorems - Superposition theorem,

Thevenin's theorem, Norton's theorem and Maximum Power Transfer theorem.

UNIT II

Single Phase AC Circuits: Single phase EMF generation, average and effective values of sinusoids, operations, complex representation of impedances, phasor diagrams, power factor, power in complex notation, solution of series and parallel circuits. Introduction to resonance in series RLC circuit, Numerical problems; Introduction to domestic wiring.



Three Phase AC Circuits: Three-phase systems: Star and delta connections, three-phase three wire and three-phase four-wire systems, analysis of balanced and unbalanced star and delta connected loads, power in three-phase balanced circuits. Numerical problems.

UNIT III

Measuring Instruments: Types of instruments, Construction and working principles of PMMC and Moving Iron type voltmeters & ammeters, Use of shunts and multipliers; dynamometer, wattmeter, AC watthour meter.

Magnetic circuits: Ampere's circuital law, B –H curve, Hysteresis, Permeability and Reluctance, Solution of magnetic circuits, Hysteresis and eddy current losses.

UNIT IV

Single Phase Transformer: Transformers: Construction and operation of single phase transformer, EMF equation, ratings, phasor diagram on no load and full load, equivalent circuit, regulation and efficiency calculations, open and short circuit tests, single phase auto-transformers.

Electric Machines: Working principle, Construction and applications of DC machines and AC machines, Single phase induction motors - split phase, capacitor start and capacitor start & run motors; EMF and Torque equations, Characteristics of DC generators and motors, Speed control of DC motors and DC motor starters.

Text Books:

1. E. Hughes, "Electrical Technology," Pearson Education, 2010.
2. I. J. Nagrath and D. P. Kothari, 'Basic Electrical Engineering' TATA McGraw Hill Education, 2009.

References Books:

1. V. Del Toro, "Electrical Engg Fundamentals," PHI Learning, 2009.
2. B. Dwivedi & A. Tripathi "Fundamentals of Electrical Engineering" Wiley India.
3. D. A. Bell, "Electric Circuits," 7th Ed., Oxford Higher Education, 2009.



EC -101: FUNDAMENTALS OF ELECTRONICS ENGG.

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT I

Semiconductors: Energy band concept of materials, difference between metal, insulator and semiconductor, Intrinsic and extrinsic semiconductors (n-type & p-type), current conduction in semiconductor, Photodiode, photo-transistor, LED and seven-segment display.

Semiconductor Diodes: p-n junction diode, Depletion layer, Energy diagrams of p-n junction and depletion region, Biasing of diode and V-I Characteristics; Rectifiers - half-wave, full-wave and bridge rectifiers; Filters - L, C, LC and π filters; Zener diode, V-I Characteristics and Zener diode as voltage regulator.

UNIT II

Bipolar Junction Transistors (BJT): Transistor operation and current components in p-n-p and n-p-n transistors, input/output characteristics of CB and CE configurations, Biasing of transistors - fixed bias, emitter bias, potential divider bias, comparison of biasing circuits; Transistor as an Amplifier; Numerical problems as applicable.

Field Effect Transistors (FET): Basic construction, transistor action, concept of pinch off, maximum drain saturation current, input and transfer characteristics, characteristic equation CG, CS and CD configurations, fixed & self-biasing.



MOSFET: Depletion and enhancement type MOSFET- Construction, operation and characteristics.

UNIT III

Oscillators: Introduction, Criteria for oscillation, types of oscillators - Hartley, Calpitt, RC Phase shiftand Wein bridge oscillators.

Operational Amplifiers: Concept of ideal operational amplifiers, ideal operational amplifiersparameters, inverting, non-inverting and unity gain amplifiers, adders and difference amplifiers.

UNIT IV

Number System and Logic Design: Number systems, Conversions and code, conversion of bases(decimal, binary, octal and hexadecimal numbers), addition and subtraction, Boolean algebra, logic gates (AND, OR, NAND, NOR, XOR, XNOR), concept of universal gate.

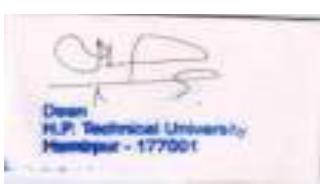
Electronic Instruments: Operation of CRO and its applications, Signal Generator, measurement ofvoltage, phase and frequency using CRO.

Text Books:

1. Electronic Devices and Circuits – D. A. Bell - 5th Edition (Oxford)
2. Electronics –Fundamentals & Applications –D. Chattopadhyay and P. C. Rakshit - 11th Edition (New Age International)
3. Electronic Devices & Circuits – R. L. Boylestad & L. Mashelsky – 10th Edition (Pearson)
4. Digital Principles and Applications– A. Malvino and Leach - 7th Edition (TMH)

References Books:

1. Electronic Principles – A. Malvino & D. J. Bates - 7th Edition (TMH)
2. Integrated Electronics – J. Millman, Halkias & Parikh - 2nd Edition (TMH)



ME-103: WORKSHOP TECHNOLOGY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
1	0	3	3	40	60	100	3 hrs

Note: The paper setter will set 8 questions in all one question from each Unit and one question (Q. No.8) covering all Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal (12) marks.

UNIT – I

Introduction to Engineering Materials, and their classification; Steels, Cast Irons and their classification, their properties & applications; Wrought iron; Alloy steels: stainless steel and tool steel.

Unit-II

Introduction to Metal Forming Processes, and Tools, Hot-working versus cold-working, Introduction to Rolling, Wire & Tube-drawing/making and Extrusion, and their uses; Press-work, Die & Punch assembly, applications of forming.

UNIT III

Basic Casting Processes, Casting equipment, Type and composition of Molding sands and their desirable properties; Mould making with the use of a core, applications of casting.

UNIT IV

Non-Metallic Materials: Common types, Carpentry tools & uses of Wood, common types of Joints in wood.



Unit-V

Machining, Machinining Tools, Basic principles of Lathe and operations performed on it. Basic description of Shape, Planer, Drilling, Milling & Grinding.

UNIT VI

Introduction to Welding, classification of welding processes, Welding Tools, Introduction to Electric-Arc welding, Resistance welding, Gas-welding, types of flames and their applications, Soldering & Brazing processes and their uses.

UNIT VII

Fitting tools, fitting operations, sawing, filing, chipping, thread cutting (with taps and dies), marking and marking tools.

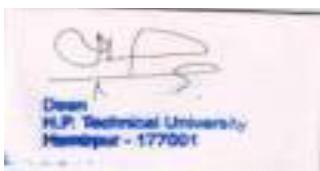
Introduction to Manufacturing Systems, Fundamentals of Numerical Control (NC), Advantage of NC systems, Classifications of NC, Comparison of NC and CNC.

Text Books:

1. "Workshop Technology", Chapman, W. A. J. and Arnold, E., Vol. I & III, Viva Low priced Student Edition.
2. "Elements of Workshop Technology", Chaudhary, Hajra, "Media Promoters & Publishers.
3. "Manufacturing Processes", Kalpakjian and Schmid, Pearson

References Books:

1. "Manufacturing Processes", H. N .Gupta, R. C. Gupta, ArunMital, New Age
2. "Workshop Technology", Raghuvanshi, B. S. Vol. I & II, DhapatRai and Sons.
3. "Manufacturing Process", BEGEMAN, M. I. and Amsted, B. H., John Wiley.



Suggested list of jobs, a student is required to make in the workshop - at least one job in each shop:

1. Introduction

- Introduction to Need and importance of workshop, different materials to be utilized Applications of Ferrous and Non-Ferrous metals alloys
-

2. Carpentry Shop:

- Study of tools & operations and carpentry joints.
- Prepare half-lap corner joint, mortise & tennon joints
- Simple exercise on wood working lathe

3. Fitting Shop:

- Study of tools & operations
- Simple exercises involving fitting work -drilling, tapping or dieing

4. Black Smithy Shop:

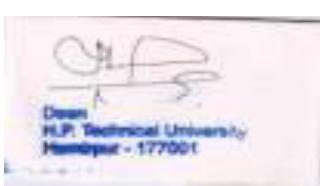
- Study of tools, operations, hot and cold working,
- Simple exercises base on black smithy operations such as upsetting, drawing down, punching, bending, fullering & swaging.

5. Welding Shop:

- Study of equipments of Arc Welding and Gas welding (MIG/TIG)
- Preparation of Simple butt and Lap welded joints.
- Oxy-acetylene flame cutting and related job preparation

6. Sheet-metal Shop:

-



Introduction to Tools, Metals used in sheet metal work viz. Galvanised iron, Aluminium sheet, etc. Fabrication of Funnel, tool-box, tray, electric panel box etc.



7. Machine Shop:



Study of Lathe, Drilling, Shaper, Planer and Milling Machines and commonly done operations on these machines



Making a job on lathe involving plane turning, step turning, taper turning and threading operations

8. Foundry Shop:



Study of tools & operations, and pattern allowances To prepare a Mould with the use of a core and cast it



Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	0	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT I

Introduction: Principles of Disaster Management. Natural Disasters such as Earthquake, Floods, Fire, Landslides, Tornado, Cyclones, Tsunamis, Nuclear, Chemical, Terrorism, Extra Terrestrial and other natural calamities. Hazards, Risks and Vulnerabilities. Assessment of Disaster Vulnerability of a location and vulnerable groups, National policy on disaster Management.

UNIT II

Prevention, Preparedness and Mitigation measures for various Disasters, Post Disaster Relief & Logistics Management, Emergency Support Functions and their coordination mechanism, Resource & Material Management, Management of Relief Camp, Information systems & decision making tools, Voluntary Agencies & Community Participation at various stages of disaster management, Integration of Rural Development Programmes with disaster reduction and mitigation activities.

UNIT III

Renewable and non-renewable resources, Role of individual in conservation of natural resources for sustainable life styles. Use and over exploitation of Forest resources, Deforestation, Timber extraction, Mining, Dams and their effects on forest and tribal people. Use and over exploitation of surface and ground water resources, Floods, Drought, Conflicts over water, Dams- benefits



and problems. Causes, effects and control measures of Air pollution, Water pollution, Noise pollution and Nuclear hazards.

UNIT IV

Global Environmental crisis, Current global environment issues, Global Warming, Greenhouse Effect, role of Carbon Dioxide and Methane, Ozone Problem, CFC's and Alternatives, Causes of Climate Change Energy Use: Past, present and future, Role of Engineers.

TEXT BOOKS:

1. Disaster Management By G. K. Ghosh A. P. H. Publishing Corporation.
2. Environmental Studies, R Rajgopalan, Oxford University Press

REFERENCE BOOKS:

1. Disaster Management By B Narayan A. P. H. Publishing Corporation.
2. Environmental Studies, Basak, Pearson Publication.



Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT - I

Introduction to Business Communication: Importance of communication in business, process models of communication, and Types of information- order, advise, suggestion, motivation, persuasion, warning and education.

UNIT- II

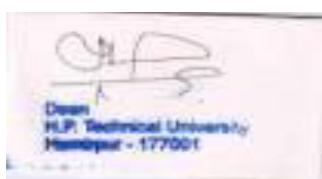
Business Communication: Letters, Cover Letter, Differences between bio-data, CV and Resume, Letter for Job Application, Thank You Letter, Letter of Complaint, Memos, Memorandum drafting; E. Communication: Email and Social Media.

Oral Communication: Types of oral communication, Barriers to oral communication, Mass Communication – Nature & Scope of Mass Communication, function of mass communication – Media of mass communication.

UNIT-III

Business Report Writing: Report Writing: Types, Structure of a report, Methods and Models of Report Writing, Technical Proposal - Concept, Layout, and Examples of Technical Proposals.

Types of reports: Progress and Annual reports–format and Analysis of sample reports from industry– Synopsis and thesis writing.



UNIT IV

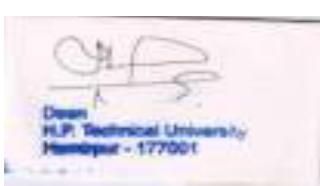
Spoken and Presentation Skills: Impromptu speech—tackling hesitation, shyness and nervousness in speaking –Public speaking; Academic and professional presentations – Group discussions, Planning, preparing and delivering a presentation, essentials of presentation - etiquette, clarity, lively delivery – speech rhythm, speech initiators body language – voice, posture & gesture, eye contact, dress codes; Interviewing, Negotiating a job offer.

Text Books:

1. Essentials of Business Communication by R. Pal and JS Korlahhi, Sultan Chand & Sons, New Delhi.
- 2 Basic Communication Skills for Technology by Andre J. Rutherford, Pearson Education Asia, patparganj, New Delhi 92.

Reference Books:

1. Business Communication by Meenakshi Raman and Prakash Singh (Oxford)
2. Advanced Communication Skills, V. Prasad, Atma Ram Publications, New Delhi.



MA - 202 ENGINEERING MATHEMATICS - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The paper setter will set two questions from each Section/Unit and one question (Q. No. 9) covering all Sections/Units which is compulsory and of short answer type of one mark each. A candidate is required to attempt 5 questions selecting one question from each section. All questions carry equal marks.

UNIT I

Ordinary Differential Equations: Brief review of first order ordinary differential equations, Exact differential equations, Equations reducible to exact equations; Solution of differential equations – variable separable.

Linear Differential Equations of first order and Higher degree: Equations of the first order and higher degree, Linear differential equations with constant coefficients (nth order): general solution, complementary function and particular integral; Method of variation of parameters, Equations reducible to linear equations with constant co-efficients (Cauchy's and Legendre's linear equations), Applications of differential equations to engineering problems.

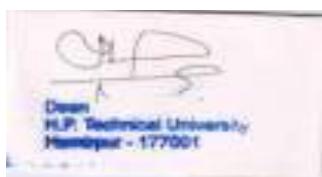
UNIT II

Series Solution of Differential Equations: Series solution of second order differential equations with variable coefficient (Power series method and Frobenius method).

Special Functions: Bessel and Legendre equations and their series solutions, Properties of Bessel function and Legendre polynomials.

UNIT III

Laplace Transforms: Laplace transforms of simple functions, Basic operational properties, Transforms of derivatives and integrals, Initial and final value theorems; Inverse Laplace transforms – Convolution theorem; Periodic functions - Unit step function, Laplace transform of Periodic function; Applications of Laplace transforms for solving linear ordinary differential equations up to second order with constant coefficients only.



UNIT IV

Fourier Series: Periodic Functions, Fourier Series of period 2π , Change of interval, Even and Odd periodic functions, Expansion of odd and even periodic functions, Half range Sine and Cosine Series, Typical wave-forms, Parseval's formula.

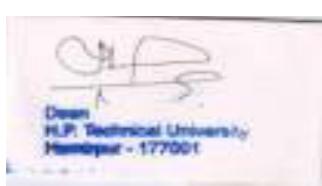
Partial Differential Equations: Harmonic analysis, Partial Differential Equations with constant coefficients, Complimentary function and particular integral.

Text Books:

- 1 B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
2. H.K. Dass and Rama Verma, Engineering Mathematics, S. Chand Publications.

Reference Books:

1. Engineering Mathematics - N.P. Bali and Manish Goel, Laxmi Publications
2. Higher Engineering Mathematics - B.V. Ramana, Tata McGraw Hill Education Pvt. Ltd., New Delhi



HS – 111 COMMUNICATION LAB

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

NOTE:- Practice sessions as per the topics in the syllabus for the course “**ENGLISH COMMUNICATION**” will be conducted in the laboratory class. Following is the suggested list of exercises that must be performed during the semester:

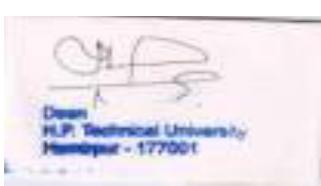
- 1. Phonetic transcription:** Students will be trained to find out the correct pronunciation of words with the help of a dictionary, to enable them to monitor and correct their own pronunciation.
 - i. transcription of words and short sentences in normal English orthography (writing) into their IPA equivalents;
 - ii. transcription of words presented orally ;
 - iii. conversion of words presented through IPA symbols into normal orthography;
 - iv. syllable division and stress marking (in words presented in IPA form).
- 2. Listening:** listening with a focus on pronunciation (ear-training), segmental sounds, stress, weakforms, intonation; the students should be exposed, if possible, to the following varieties of English during listening practice: Standard Indian, British and American.
- 3. Speaking:** pronunciation practice (for accent neutralization), particularly of problem sounds, isolated words as well as sentences, practising word stress, rhythm in sentences, weak forms, intonation; reading aloud of dialogues, poems, excerpts from plays, speeches etc. for practice in pronunciation ;
- 5. Grammar and usage:** The focus will be on the elimination of common errors. Some writing activities(e.g. writing of short paragraphs on assigned topics) can be used to identify these errors.



6. Project Work: Students will be required to produce and submit by the end of Semester a 350-500word project report on a topic of their choice. The project should involve data collection, analysis and reporting.

Recommended books:

1. English Conversation Practice by Grant Taylor.
2. Business correspondence and Report Writing: by R. C. Sharma & Krishna Mohan.
3. Chrissie Wright (Ed.); Handbook of Practical Communication Skills; JAICO Books.
4. Veena Kumar, The Sounds of English, Makaav Educational Software, New Delhi.



Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

NOTE:- Practicals as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 8-10 experiments must be performed by a student during the semester:

List of Experiments:

1. To determine the wavelength of monochromatic light by Newton's Ring
2. To find the wavelength of light from a given source using Michelson,s interferometer.
3. To determine the wavelength of spectral lines using plane transmission grating.
4. To find the value of Planck's constant.
5. To verify Stefan's law by electrical method
6. To determine the numerical aperture of an optical fibre.
7. To determine the attenuation & propagation losses in optical fibre.
8. To determine the height of a tower with a Sextant.
9. To determine the refractive index of a liquid by Newton's ring.
10. To determine the hall co-efficient.
11. To determine the band gap of an intrinsic semiconductor by four prove method.
12. To study the LASER beam characteristics like wavelength using diffraction grating aperture & divergence.
13. To calculate the hysteresis loss by tracing a B-H curve for a given sample.
14. To compare the capacitances of two capacitors by De'sauty Bridge.
15. To study the variation of magnetic field with distance by Stewart and Gee's apparatus.
16. To find the value of e/m for electron by helical method.



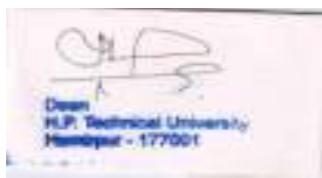
CS – 111 COMPUTER PROGRAMMING LAB

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

NOTE:- Practicals as per the topics in the syllabus for the course will be conducted in the lab class. Following is the suggested list of suggestive exercises to be performed by a student during the semester:

Write following programs in C++:

1. Using basic statements like control statements, looping statements, various I/O statements and various data structures.
2. Creating classes in C++ for understanding of basic OOPS features.
3. Representing concepts of data hiding, function overloading and operator overloading.
4. Using memory management features and various constructors and destructors.
5. Representing Inheritance, virtual classes and polymorphism.
6. Writing generic functions.
7. File handling programs.
8. Design and Implementation of some real life problems using Object Oriented techniques (Object Model/Dynamic Model/Functional Model).



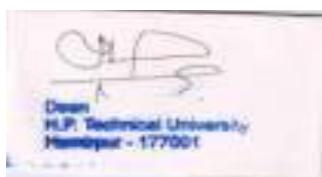
EE – 111 ELECTRICAL ENGG. LAB

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

NOTE:- Experiments as per the topics in the syllabus for the course `Principles of Electrical Engg will be conducted in the laboratory class. Following is the suggested list of experiments out of which 7-8 experiments must be performed during the semester:

List of Experiments:

1. Verification of Kirchhoff's law
2. Verification of Norton's theorem
3. Verification of Thevenin's theorem
4. Verification of Series R-L-C circuit
5. Verification of Parallel R-L-C circuit
6. Measurement of Power and Power factor of three phase inductive load by two wattmeter method
7. To draw the magnetization characteristics of separately excited dc motor.
8. To perform the external load characteristics of dc shunt motor.
9. To perform O.C. and S.C. test of a single phase transformer
10. Wiring Exercises:
 - (a) Study of various wiring components (wires, switches, fuse, sockets, plugs, lamp holders, lamps etc. their uses and ratings).
 - (b) Control of two lamps from two switches (looping system).
 - (c) Staircase wiring.
11. Step down transformer winding of less than 5VA.



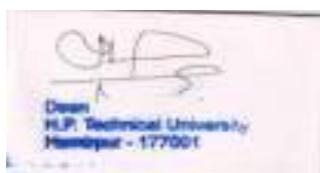
CH – 111 ENGINEERNG CHEMISTRY LAB

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

NOTE:- Practicals as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 8/10 experiments must be performed by a student during the semester:

List of Experiments:

1. To determine surface tension of given liquid by drop number method using stalgmometer.
2. To determine % age of moisture, volatile matter, ash and fixed carbon in given sample of coal by proximate analysis method.
3. To determine total alkalinity in a given sample of water using standard acid.
4. To determine the percentage of Chlorine in sample of CaOCl_2 dissolved in one litre of solution.
5. To determine total hardness of water using complexometric titration method.
6. To determine the surface tension of the two given unknown liquids by using Stalgmometer and identify the given liquid.
7. To determine the coefficient of viscosity of the given unknown liquids by using Ostwald's Viscometer and identify the given liquid.
8. To determine the coefficient of viscosity of the given lubricating oil using Red Wood Viscometer.
9. To determine total acid number value(total acid number TAN) of an oil sample.
10. To determine the flash point and fire point of given sample of oil using Pens key Marten's apparatus.
11. To determine the amount of Chlorine in given sample of water using N/20 sodium Thiosulphate solution.
12. To determine the Beer's Law and apply it to find the concentration of given unknown solution by spectra-photometer.

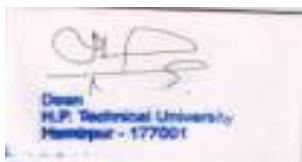


Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course '**Fundamentals of Electronics Engg**' will be conducted in the laboratory class. Following is the suggested list of experiments out of which 7-8 experiments must be performed during the semester:

List of Experiments:

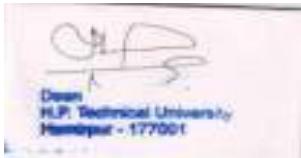
1. Familiarization with electronic components (Active & Passive)
2. Familiarization with electronic equipments (multimeters, CROs, power supply and function generators)
3. (a) Study of the characteristics of P-N junction diode,
 (b) Study of the characteristics of Zener diode
4. (a) Construction of half-wave rectifier and full wave rectifier circuits & study of their output waveforms by CRO and calculation of efficiency and ripple factor.
 (b) Construction of an unregulated DC power supply (using transformer, fullwave rectifier and capacitor filter) and study of its output waveform by CRO.
5. Study of frequency response of any one oscillator.
6. Study of output characteristics of a Common Emitter Transistor.
7. Study of inverting and non inverting amplifiers using Op-Amp.
8. Study of unity gain amplifier and Adder circuit using Op-Amp and observe their outputs using CRO.
9. Study of truth tables of different logic gates (AND, OR, NAND, NOR, XOR, XNOR)



C. CURRICULUM OF B.TECH CIVIL ENGINEERING

SCHEME OF TEACHING AND EXAMINATION B.TECH CIVIL ENGINEERING										
SEMESTER -III										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D	C	IA	ESE	Total
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	CE-301	Mechanics of Solids	3	2	0	4	40	60	100
4	PC	CE-302	Mechanics of Fluids - I	3	1	0	4	40	60	100
5	PC	CE-303	Engineering Surveying–I	3	0	0	3	40	60	100
6	PC	CE-304	Building Materials	2	2	0	3	40	60	100
7	OE	-	Open Elective-I	2	2	0	3	40	60	100
Labs:										
1	PC	CE-307	Building Material Lab	0	0	2	1	30	20	50
2	PC	CE-308	Fluid Mechanics Lab	0	0	2	1	30	20	50
3	PC	CE-309	Surveying Lab – I	0	0	3	2	30	20	50
			Total	16	7	7	24+2			

OPEN ELECTIVE – I										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D	C	I.A Marks	ESE Marks	Total Marks
1	OE	HS-306	Sociology & Elements of IndianHistory for Engineers	2	0	0	2	40	60	100
2	OE	HS-307	German Language – I	2	0	0	2	40	60	100
3	OE	HS-308	French Language - I	2	0	0	2	40	60	100



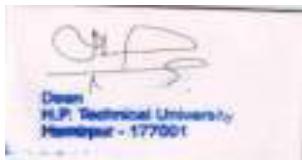
SCHEME OF TEACHING AND EXAMINATION
B.TECH CIVIL ENGINEERING

SEMESTER –IV

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		C	IA	ESE
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Human Values and Professional Ethics	2	2	0	3	40	60	100
3	PC	CE-401	Structural Analysis –I	3	2	0	4	40	60	100
4	PC	CE-402	Geotechnical Engg. –I	3	1	0	4	40	60	100
5	PC	CE-403	Engineering Surveying –II	3	0	0	3	40	60	100
6	PC	CE-404	Building Planning and Construction	2	2	0	3	40	60	100
7	OE	-	Open Elective – II	2	0	0	2	40	60	100
Labs:										
1	PC	CE-407	Geotechnical Engg. Lab-I	0	0	2	1	30	20	50
2	PC	CE-408	Engg. Surveying Lab - II	0	0	3	2	30	20	50
3	MC	CE-410	Computer Aided Building Drawing	0	0	2	1	30	20	50
			Total	15	9	7	24+2			

OPEN ELECTIVE – II

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		C	I.A	ESE
1	OE	HS-410	Law for Engineers	2	0	0	2	40	60	100
2	OE	HS-411	German Language – II	2	0	0	2	40	60	100
3	OE	HS-412	French Language - II	2	0	0	2	40	60	100



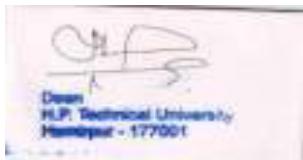
SCHEME OF TEACHING AND EXAMINATION
B.TECH CIVIL ENGINEERING

SEMESTER –V

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D	C	IA	ESE	Total
1	PC	CE-501	Structural Design - I (Masonry and RCC)	2	2	0	3	40	60	100
2	PC	CE-502	Structural Analysis - II	2	2	0	3	40	60	100
3	PC	CE-503	Geotechnical Engg. – II	2	2	0	3	40	60	100
4	PC	CE-504	Mechanics of fluids -II	3	1	0	4	40	60	100
5	PC	CE-505	Environmental Engg. – I	2	2	0	3	40	60	100
6	PC	CE-506	Transportation Engg. – I	3	1	0	4	40	60	100
7	OE	-	Open Elective – III	2	0	0	2	40	60	100
Labs:										
1	PC	CE-507	Transportation Engg. Lab - I	0	0	2	1	30	20	50
2	PC	CE-508	Environmental Engg. Lab - I	0	0	2	1	30	20	50
4	MA	CE-510	Computer Aided Building Drawing	0	0	3	1	30	20	50
			Total	16	10	7	24+2			

Open Elective – III (For Students of Other Departments)

S. N.	Subject code	Title
1	OE -501	Computer Graphics
2	OE -502	Game Theory with Engineering Applications
3	OE -503	Rural Technology & Community Development



SCHEME OF TEACHING AND EXAMINATION
B.TECH CIVIL ENGINEERING

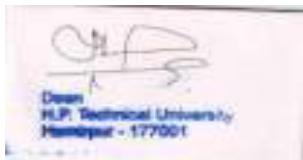
SEMESTER –VI

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		C	IA	ESE
1	PC	CE-601	Structural Design-II (RCC)	2	2	0	3	40	60	100
2	PC	CE-602	Transportation Engg. -II	3	1	0	4	40	60	100
3	PC	CE-603	EnvironmentalEngg. – II	3	1	0	4	40	60	100
4	PC	CE-604	Hydrology and Irrigation Engg.	3	1	0	4	40	60	100
5	PC	CE-605	Engineering Geology and Rock Mechanics	3	0	0	3	40	60	100
6	PE	-	Programme Elective – I	3	0	0	3	40	60	100
Labs:										
1	PC	CE-507	Engineering Geology and Rock Mechanics Lab	0	0	2	1	30	20	50
2	PC	CE-508	Engineering Design Project	0	0	4	2	30	20	50
3	PC	CE-509	Seminar	0	0	2	1	30	20	50
			Total	17	5	8	24+3			

PROGRAMME ELECTIVE – I

S. N.	Subject Code	Title
1	PE-601	Solid Waste Management
2	PE-602	Environmental Impact Assessment
3	PE-603	Earth and Earth Retaining Structures
5	PE-604	Bridge Engineering

Note: Survey Camp of four weeks duration shall be carried after IV Semester



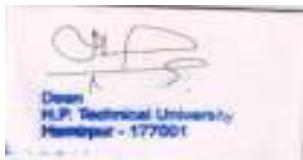
SCHEME OF TEACHING AND EXAMINATION
B.TECH CIVIL ENGINEERING

SEMESTER –VII

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A	ESE	Total
1	PC	CE-701	Design of Steel Structures	3	2	0	4	40	60	100
2	PC	CE-702	Quantity Surveying and Valuation	2	2	0	3	40	60	100
3	PC	CE-703	Construction Technology - II	2	2	0	3	40	60	100
4	PC	CE-704	Analysis and Design of Hydraulic Structures	3	1	0	4	40	60	100
5.	PE	-	Programme Elective-II	3	0	0	3	40	60	100
Labs:										
8	MA	CE-707	Project Work –I	0	0	4	2	30	20	50
9	MA	CE-708	Industrial /Practical Training(Viva-Voce)	0	0	4	2	30	20	50
7	MA	CE -710	Computer Applications	0	0	3	2	30	20	50
			Total	13	7	6	20+3			

PROGRAMME ELECTIVE-II

S. N.	Subject Code	Title
1	PE-701	Environmental Impact Assessment
2	PE-702	Bridge Engineering
3	PE-704	Transportation System & Planning



**SCHEME OF TEACHING AND EXAMINATION
B.TECH CIVIL ENGINEERING**

SEMESTER – VIII

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PE	-	Programme Elective-III	3	0	0	3	40	60	100
2	PE	-	Programme Elective-IV	3	0	0	3	40	60	100
3	MC	CE-808	Project Work - II	0	0	16	8	40	60	100
			Total	0	0	16	8+6			
OR										
4	MC	CE-809	Industrial Training	0	0	16	8	40	60	100
			Total	0	0	16	8			

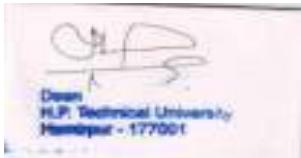
PROGRAM ELECTIVE –III

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	PE-801	Design and Construction of Pavements	3	0	0	3	40	60	100
2	PE	PE-802	Municipal Solid Waste Management	3	0	0	3	40	60	100
3	PE	PE-803	Structural Dynamics & Seismic Design	3	0	0	3	40	60	100

PROGRAM ELECTIVE –IV

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	PE-805	Advanced Construction Engg. And Management	3	0	0	3	40	60	100
2	PE	PE-806	Ground Water Engineering	3	0	0	3	40	60	100
3	PE	PE-807	Design of Multi-storey Buildings	3	0	0	3	40	60	100

Note:Industrial Project of Four monthsduration is to be carried out by the student exclusively in industry under the joint supervision of faculty advisers from institution as well as from the industry.



C. SEMESTER-III

MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties - Function of Random variables.

UNIT – III

Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

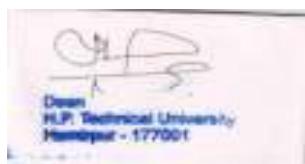
UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

Text Books:

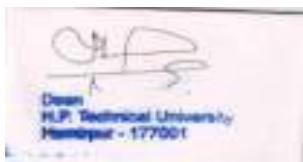
1. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
2. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.



3. Douglas C. Montgomery and George C. Runger, “Applied Statistics and Probability for Engineers”, 5th Edition, 2011.

Reference books:

1. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, “Probability and Statistics for Engineers and Scientists”, Seventh Edition, Pearson Education, Delhi, 2002.
2. Lipschutz. S and Schiller. J, “Schaum’s outlines - Introduction to Probability and Statistics”, McGraw-Hill, New Delhi, 1998.
3. S. M. Ross, “Introduction to Probability and Statistics for Engineers and Scientists” 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics - Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

UNIT - II

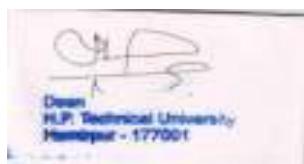
Value Analysis - Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.

Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages, incentives, recruitment, training and industrial relations.



UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet, break evenanalysis - basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketingenvironment, marketing mix, advertising and sales promotion.

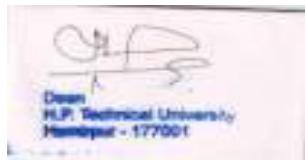
Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

Text Books:

1. PanneerSelvam, R, “*Engineering Economics*”, Prentice Hall of India Ltd, New Delhi.
2. Dwivedi, D.N., “*Managerial Economics, 7/E*”, Vikas Publishing House.

Reference Books:

1. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., “*Engg. Economy 15/E*”,Prentice Hall, New York, 2011.
2. Chan S. Park, “*Contemporary Engineering Economics*”, Prentice Hall of India, 2002.
3. F. Mazda, *Engg.Management*, Addison Wesley, Longman Ltd., 1998.
4. O. P. Khanna, *Industrial Engg.and Management*,DhanpatRai and Sons, Delhi, 2003.
5. P. Kotler, *Marketing Management, Analysis, Planning, Implementation and Control*,Prentice Hall, New Jersey, 2001.
6. VenkataRatnam C.S & Srivastva B.K,*Personnel Management and Human Resources*, Tata McGraw Hill.
7. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill.
8. Bhattacharya A.K., *Principles and Practice of Cost Accounting*, Wheeler Publishing.
9. Weist and Levy, *A Management guide to PERT and CPM*, Prantice Hall of India.
10. Koontz H.,O'Donnell C.,&Weihrich H, *Essentials of Management*, McGraw Hill.



CE 301: MECHANICS OF SOLIDS - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	2	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Stresses and Strains: Introduction, Properties of Materials, Stress, Strain, Hook's law, Poisson's Ratio, Stress – Strain Diagram for structural steel and non-ferrous materials, Principles of superposition, Total elongation of tapering bars of circular and rectangular cross sections, elongation due to self – weight; Composite section, Volumetric strain, expression for volumetric strain, Elastic constants, relationship among elastic constants, Thermal stresses (including thermal stresses in compound bars).

Compound Stresses: Introduction, Stress components on inclined planes, General two-dimensional stress system, Principal planes and stresses, Mohr's circle of stresses.

UNIT – II

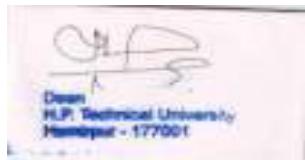
Bending Moment and Shear ForceDiagrams for Statically DeterminateBeams: Determinate beams, Type supports and loading, Shearforce and Bending moment, Sign convention, SF and BM diagrams for cantilevers, simply supported and overhanging beams under point loads, UDL, UVL and Couples.

Bending and Shear Stresses in Beams: Introduction – Bending stress in beam, Assumptions in simple bending theory, Derivation of Bernoulli's equation, Modulus of rupture, Section modulus, Flexural rigidity, Expression for horizontal shear stress in beam, Shear stress diagram for rectangular, symmetrical 'I' and 'T' section (Flitched beams not included).

UNIT – III

Torsion of Circular Shafts: Introduction – Pure torsion-torsion equation of circular shafts, Strength and stiffness, Torsional rigidity and polar modulus, Power transmitted by shaft of solid and hollow circular sections.

Transverse Deflectionof Beams: Definitions of slope, deflection, Elastic curve - derivation of differential equation of flexure, Sign conventions, relationship between moment, slope and deflection, transverse deflection in determinate beams using method of Successive integration.



UNIT - IV

Thin Cylinders and Spheres:Stresses in cylinders and spheres subjected to internal pressures.

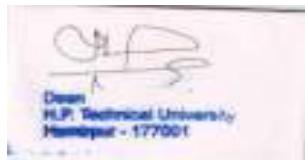
Columns and Struts:Introduction – Short and long columns, Euler's theory on columns, effective length, slenderness ratio, radius of gyration, buckling load, assumptions, derivations of Euler's Buckling load for different end conditions, Limitations of Euler's theory, Rankine Gordon's empirical formula, problems.

Text Books:

1. Popov, E. P., "*Engineering Mechanics of Solids*", SI Version, Prentice Hall, New Delhi.
2. Timoshenko, S. P. and Young, D. H., "*Elements of Strength of Materials*", East West Press, New Delhi.
3. Subramanyam, "*Strength of Materials*", Oxford University Press, Edition, 2008

Reference Books:

1. Shames, I. H. Pitarresi, J. M., "*Introduction to Solid Mechanics*," Prentice-Hall, NJ.
2. NPTEL courses, <http://nptel.iitm.ac.in/courses.php>, web and video courses on Strength of Materials by Sharma, S. C., and Harsha, S. P.
3. M.L. Gambhir, Fundamentals of structural Mechanics and analysis, Printice Hall India.
4. Beer, P. F. and Johnson, E. R., "*Mechanics of Materials*", SI Version, McGraw Hill, NY.
5. Patel, A. H. and Singer, F. L., "*Strength of Materials*", Harper Collins, New Delhi.



CE 302: MECHANICS OF FLUIDS - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT- I

Fluid Properties: Introduction of fluid, system of units, Fluid properties -Mass density, Specific weight, Specific gravity, Specific volume, Viscosity, Cohesion, Adhesion, Surface tension& Capillarity, fluid as a continuum, Newton's law of viscosity, Capillary rise in a vertical tube and between two plane surfaces, vapour pressure of liquid, compressibility and bulk modulus, surface tension- pressure inside a water droplet, pressure inside a soap bubble, Numerical problems.

Fluid Statics: Definition of pressure, Variation of pressure with depth, Pascal's law, Types of pressure, Introduction to pressure measurements of pressure using simple, differential & inclined manometers, Introduction to mechanical and electronic pressure measuring devices - Transducers, Hydrostatic forces on plane and curved surface, centre of pressure; Buoyancy, equilibrium, metacentre, metacentric height & its determination; Stability of floating & submerged bodies.

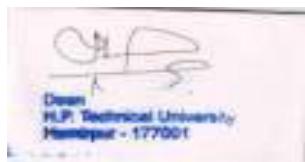
UNIT- II

Kinematics of Flow: Kinematics of fluid flow, scalar, vector and tensor quantities, classification of fluid flow, methods of describing fluid motion, fundamentals of flow visualization, discharge or rate of flow, three-dimensional continuity equation in Cartesian coordinate, stream line, potential function, streamfunction, orthogonality of streamlines and potential lines.

Dynamics of Flow: Surface and body forces, Euler's equations of motion along a stream line, Bernoulli's equation and its applications—Venturimeter, Orifice meter and Pitot tube; Kinetic energy correction factor; Momentum equation, application of momentum equation - forces on plates and pipe bends; Navier- Stokes equation (explanation only).

UNIT- III

Flow Measurement: Introduction, Orifices - classification, hydraulic coefficients, Time for emptying tanks by orifices; Mouthpiece - classification, Borda's mouthpiece; Notches & Weirs –Introduction, classification, discharge over rectangular, triangular, trapezoidal notches, Cippoletti notch, broad crested weirs, relative



error and sensitivity, Concept of proportional weir, advantages of proportional weirs, concept of geometrically simple weirs.

Dimensional Analysis and Similitude: Dimensional analysis - Rayleigh's method, Buckingham π -theorem; Significance and use of dimensionless numbers in experimental investigation, Similitude - geometric, kinematic and dynamic similarities; Model testing- model laws, undistorted and distorted models.

UNIT- IV

Flow through Pipes: Introduction, Major and minor energy losses, Darcy-Weisbach equation for head loss due to friction in a pipe, hydraulic gradient and total energy lines, pipes in series and parallel, equivalent pipes; Pipe Networks - Hardy Cross method, Numerical problems.

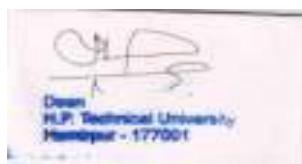
Power transmission through pipe: Flow through nozzle at end of pipe, water hammer phenomenon.

Text Books

1. Modi, P. M. and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House.
2. Dr. R.K. Bansal, A Text book of Fluid Mechanics and Hydraulic Machines, Laxmi Publications, New Delhi.
3. R.K.Rajput, A TextBook of Fluid Mechanics & Hydraulic Machines, S.Chand & Co, New Delhi, 2006.

Reference Books

1. Douglas, J.F., Gasiorek, J.M .andSwaffield, J.A., Fluid Mechanics 4thEdn., Pearson Education India.
2. Arora, K.R., Fluid Mechanics, Hydraulic and Hydraulic Machines, Standard Publishers and Distributors, New Delhi.
3. Frank M. White, Fluid Mechanics (Sixth Edition), Tata McGraw-Hill, New Delhi (2008).
4. Streeter, Fluid Mechanics, Wylie, Bedford New Delhi, 2008 (Ed).



CE 303: ENGINEERING SURVEYING—I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT- I

Introduction: Classification of surveys -reconnaissance – principles-provision of control -conventional signs. Chain survey: Instruments -principles of chain survey -field book -plotting -tie line and check line - chaining and ranging -obstacles -chaining on sloping ground -errors-uses of cross staff and optical square.

Compass Survey: Prismatic compass –surveyor's compass -whole circle and reduced bearing-true and magnetic bearing -dip and declination -local attraction -traversing -plotting -error of closure -graphical and analytical adjustments.

UNIT- II

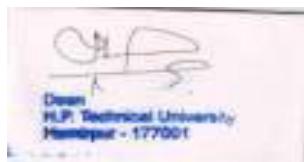
Plane Table Surveying: Definitions, uses and advantages, temporary adjustments. Different methods of plane table surveying; Two point and three point problems. Errors in plane table survey.

Leveling: Definition of level surfaces -mean sea level -reduced level -bench marks -leveling instruments - temporary and permanent adjustments -fly leveling -booking -reduction of levels -corrections for refraction and curvature -reciprocal leveling -longitudinal leveling and cross sectioning -contour survey -definition - characteristics of contour -uses of contour -methods of contouring -direct and indirect interpolation – plotting. Computation of volume by trapezoidal and prismoidal formula, volume from spot levels, volume from contour plan; Trigonometric leveling considering refraction and curvature correction, axis signal correction.

UNIT- III

Theodolite Surveying: Various parts and axes of transit, technical terms, temporary adjustments. Measurement of horizontal and vertical angles -method of repetition and reiteration; Theodolite traverse - Different methods of running theodolite traverses, Gales' traverse table, balancing of traverse by Bow-Ditch's transit and modified transit rules; Problems on one-plane and two-plane methods, omitted measurements, errors in theodolite survey.

Setting out Works: General horizontal and vertical control, setting out of foundation plan for load bearing and framed structure, batter board, slope and grade stakes, setting out with theodolite; setting out of sewer line, culvert, use of laser for works; setting out center line for tunnel, transfer of levels to underground work project / route survey for bridge, dam and canal; checking verticality of high rise structures.



UNIT- IV

Areas of Figures: Area of an irregular figure by Trapezoidal rule, average ordinate rule,Simpson's 1/3 rule, various coordinate methods;Planimeter - types of planimeterincludingdigitalplanimeter, area of zero circle, use of planimeter.

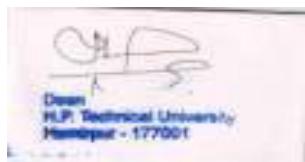
Curves:Types of curves, elements ofa curve,simple curves;different methods for setting outof simple curves –linear and angular methods; transition curves, vertical curves–types, characteristics andsetting out; Methods of setting out super elevation.

Text Books:

1. N.N.Basak, Surveying and Leveling, 1st edition,Tata McGraw Hill.
2. A Bannister, S. Raymond and R Baker, Surveying, seventh edition, Pearson.

Reference Books:

1. Kanetkar and Kulkarni, Surveying and Leveling, Vol I & II, 24th edition, Pune VidyarthiGriha, Pune.
2. R.Agor, Surveying, Khanna Publishers.



CE 304: BUILDING MATERIALS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT- I

Stones and Bricks: Physical and mechanical properties of construction materials, commonly used stones - Artificial, decorative and cladding stones, Tests for stones. Bricks - Classification and testing of bricks, fire bricks. Building blocks- solid, hollow and paving blocks- types and applications. Lime -types and applications. Pozzolanic materials – fly ash, rice husk ash and GGBFS, Industrial wastes for concrete making.

Materials for Floors and Walls: Ceramic, terrazzo and clay tiles – types and uses; Materials of finish for residential, commercial and industrial floors. Materials of wall finish – interior and exterior, wall panelling materials, materials for architectural finishes.

UNIT- II

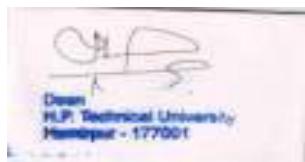
Materials for Building Services: Timber-Market forms, seasoning and various products; Structural Steel and Aluminium –Roofing material, physical descriptions of asbestos sheets, GI sheets, tubes and light weight roofing materials; Modern materials –Neoprene, decorative panels and laminates, architectural glass and ceramics, PVC, polymer base materials, fibre reinforced plastics.

UNIT- III

Bitumen and Bituminous Products: Pavement grade bitumen – asphalt, cut back bitumen, bituminous emulsion, mastic bitumen, bituminous felt; Joint filler compound – Joint sealant compound, anti-stripping compound, Polymer modified bitumen, latex modified bitumen and crumb rubber modified bitumen.

UNIT- IV

Modern Materials: Glass, Ceramics, and Sealants for joints; Sheets for pitched roof coverings; Fibre glass reinforced plastic; Clay products – Refractories; Composite materials –Types, application of laminar composites; Fibre textiles- Mats and pads for earth reinforcement; Polymers and resins for building repair.

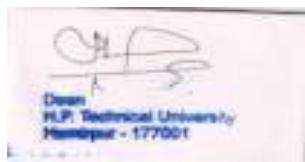


Text Books:

1. Surendra Singh, Building Materials, Vikas Publishing Company, New Delhi, 2002.
2. Rajput,R.K., Engineering Materials, S.Chand& Co. Ltd., New Delhi, 2000.

Reference Books:

1. Khanna, S.K., Justo, C.E.G, Highway Engineering, Nem Chand & Bros, Roorkee, 2007.
2. Kadiyali, L. R, Highway Engineering, Khanna Publishers, New Delhi, 2007



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT- I

Introduction to sociological concepts - structure, system, organization, social institution, Culture social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT –II

Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

UNIT –III

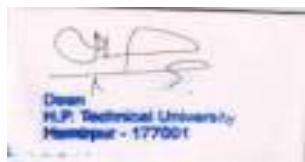
Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.

UNIT - IV

From feudalism to colonialism -the coming of British; Modernity and struggle for independence.

Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India 2nd phase (LPG decade post 1991)

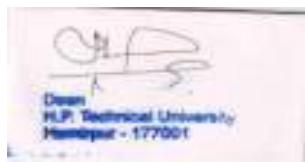


Text Books:

1. Desai, A.R. (2005), Social Background of Indian Nationalism, Popular Prakashan.
2. Giddens, A (2009), Sociology, Polity, 6th Edition.
3. Chandoke, Neera & Praveen Priyadarshi (2009), Contemporary India: Economy, Society and Politics, Pearson.

Reference Books:

1. Guha, Ramachandra (2007), India After Gandhi, Pan Macmillan.
2. Haralambos M, RM Heald, M Holborn (2000), Sociology, Collins.
3. Sharma R. S. (1965), Indian Feudalism, Macmillan.
4. Gadgil, Madhab & Ramchandra Guha (1999) - This Fissured Land: An Ecological History of India, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßigeVerbenimPräsens - “sein” und habenimPräsens -PersonalpronomenimNominativ.

UNIT- II

WichtigeSprachhandlungen: TelefonNummernverstehen und sprechenUhrzeitenverstehen und sagenVerneinung “nicht und kein” (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notierenbestimmter und unbestimmterArtikelundNegativartikelim Nom. &Akkusativ

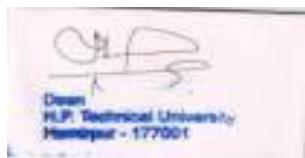
UNIT- III

WichtigeSprachhandlungen: Tageszeitenverstehen und überTermingesprechen-Verabredungenverstehen - AufgabenimHaushaltverstehen

Grammatik: PersonalpronomenimAkkusativ und Dativ - W-Fragen “wie, wer, wohin, wo, was usw.-GenitivbeiPersonennamen - ModalverbenimPräsens “können, müssen,möchten”

UNIT- IV

WichtigeSprachhandlungen: Sichaustauschen, was man kann, muss –BezeichnungenLebensmittel – Mengenangabenverstehen – PreiseverstehenundEinkaufzettelschreiben



Grammatik: Wortstellung in Sätzen mit Modalverben – Konnektor „und“ – „noch“-kein-----mehr – „wieviel, wieviele, wie alt, wie lange“ – Possessivartikel im Nominativ.

UNIT V

Wichtige Sprachhandlungen: Freizeitanzeigen verstehen

Hobby und Sportarten Anzeigen für Freizeitpartner schreiben bzw. – darauf antworten – Vorlieben und Abneigungen ausdrucken

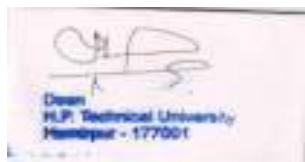
Grammatik: Verben mit Vokalwechsel im Präsens – Modalverben im Präsens “dürfen, wollen und mögen” – “haben und sein” im Präteritum – regelmäßige Verben im Perfekt – Konnektoren “denn, oder, aber.”

TEXT BOOK

1. Studio d A1. Deutsch als Fremdsprache with CD. (Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offer opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verb of self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the French alphabet and the accents that play a vital role in the pronunciation of the words.

Writing: Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subjectpronouns.

Listening and Speaking: Pronunciation of words like Isabelle, presentez and la liaison – vous êtes, vousappelez and role play of introducing each other – group activity.

Writing: Particulars in filling an enrolment / registration form.

Reading Comprehension: reading a text of a famous scientist and answering questions.

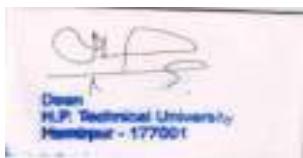
UNIT – III

Grammar and Vocabulary: Verb of possession “avoir” and 1st group verbs “er”, possessive adjectives and pronouns of insistence- moi, lui..and numbers from 0 to 20.

Listening and Speaking: Nasal sounds of the words like feminine, ceinture, parfum and how to ask simple questions on one’s name, age, nationality, address mail id and telephone number.

Writing: Conjugations of first group verbs and paragraph writing on self – introduction and introducing a third person.

Reading Comprehension: reading a text that speaks of one’s profile and answering questions



UNIT – IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb “aimer” and seasons of the year and leisure activities.

Listening and Speaking: To express one’s likes and dislikes and to talk of one’s pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing: Conjugations of the irregular verbs: faire and savoir and their usage. Paragraph writing on one’s leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one’s way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs, a droite, la première à gauche and vocabulary relating to accommodation.

Listening and Speaking: To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing: Paragraph writing describing the accommodation using the different prepositions like en face de, derrière- to locate.

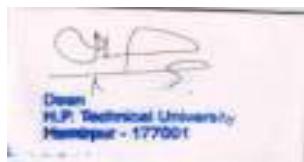
Reading Comprehension: A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliothèque?.....

TEXT BOOK

1. Tech French

REFERENCES

1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



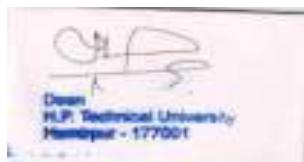
CE 307: MATERIAL TESTING LAB

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam/ Viva	Total	
0	0	2	1	30	20	50	3 hrs

Note: At least two tests must be conducted for each construction material.

List of experiments for different construction materials:

1. Tests on cement - Fineness, Normal consistency, Setting time, Soundness, Compressive strength.
2. Test on bricks: Water absorption, Efflorescence, Compressive strength.
3. Tests on aggregate: Physical Properties - Grain size distribution, Specific gravity, Density, Void ratio, bulking of sand; Aggregate crushing value.
4. Properties of fresh concrete: workability tests - Flow & Vee-bee tests, Slump & Compaction factor test.
5. Tests on Timber: Compressive strength –parallel to grain & perpendicular to grain, Bending tests
6. Test on tiles: Transverse strength, Water Absorption of Flooring tiles and Roofing tiles.



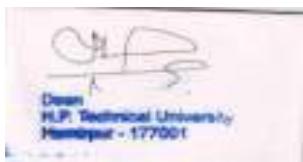
CE 308: FLUID MECHANICS LAB

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam/ Viva	Total	
0	0	2	1	30	20	50	3 hrs

Note: At least eight to nine experiments must be performed.

List of experiments:

1. To verify Bernoulli's theorem
2. To verify the momentum equation using the experimental set up on impact of jet.
3. To determine the coefficient of discharge of Venturimeter
4. To determine the coefficient of discharge of Orifice meter
5. To determine the coefficient of discharge of Rectangular Notch
6. To determine the coefficient of discharge of Triangular Notch
7. To determine the coefficient of discharge of an orifice of a given shape. Also to determine the coefficient of velocity and the coefficient of contraction of the orifice and mouth piece.
8. To determine the variation of friction factor 'f' for turbulent flow in commercial pipes.
9. To study the transition from laminar to turbulent flow and to determine the lower critical Reynolds number.
10. To study the boundary layer velocity profile over a flat plate and to determine the boundary layer thickness.



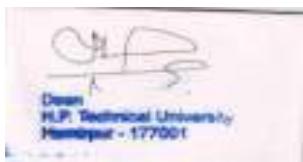
CE 309: ENGINEERING SURVEYING LAB

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam/ Viva	Total	
0	0	3	2	30	20	50	3 hrs

Note: At least eight experiments must be performed.

List of experiments:

1. Chain & Compass Traversing -Traversing and plotting of Details
2. Plane table Survey - Method of Radiation and intersection
3. Plane table Survey - Solving Two Point and Three Point Problems
4. Plane table Survey - Traverse
5. Leveling - Fly leveling, Longitudinal and cross sectioning and Contour surveying
6. Setting out offoundation plan for load bearing and framed structure.
7. Setting out of sewer line, culvert,
8. Settingout center line for tunnel, transfer of levels to underground work Project
9. Checking verticality of high rise structures.
10. Theodolite: temporary adjustments , measurement of horizontal and vertical angles.
11. Theodolite traversing
12. Study of Minor instruments: Planimeter, pantograph, clinometer, hand levels, Quick setting level, CylonGhat Tracer, Sextent, etc.



SEMESTER-IV

MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

UNIT – II

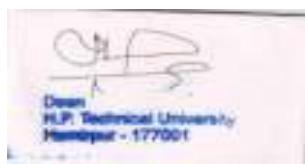
Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.

UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.

Approximation methods for nonlinear programming: Line search methods, gradient methods, conjugate gradient methods; Networking techniques – PERT and CPM.



UNIT - IV

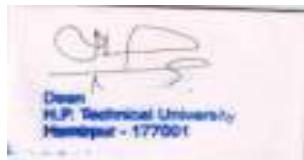
Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and it's role in minimization, minimization under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

1. C. B. Gupta, "Optimization Techniques in Operation Research," I. K. International Publishing House Pvt. Ltd.
2. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
3. Mukesh Kumar Singh, "Calculus Of Variations" Krishna Prakashan Media (P) Ltd.
4. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

1. I. M. Gelf and S. V. Fomin, "Calculus of Variations" Dover Publications IncMineola, New York.
2. Purna Chand Biswal, "Optimization in Engineering, Scitech Publications India Pvt. Ltd.
3. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
4. G. Hadly, Linear Programming, Narosa Publishing House.
5. KantiSwarup, P. K. Gupta and Manmohan, "Operations Research," Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

1. Understanding the need , basic guidelines, content and process of value Education
2. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

1. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
2. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
3. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
4. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

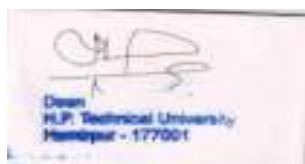
1. Understanding human being as a co-existence of the self and the body.
2. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
3. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

1. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
2. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.

UNIT V: Harmony in Family, Society and Nature

1. Understanding harmony in the family, society and nature.
2. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.



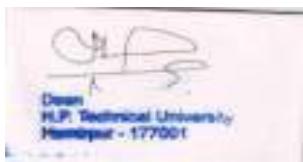
3. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

1. R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).
2. R R Gaur, R Sangal and G P Bagaria, Teacher's Manual (English), 2009.

Reference Books

1. E.F. Schumacher, Small is Beautiful; a study of economics as if people mattered, Blond & Briggs, Bratain, 1973.
2. PL Dhar, RR Gaur, Science and Humanism, common wealth publishers, 1990.
3. A.N. Tripathy, Human values, New Age International Publishers, 2003.
4. E.G. Seebauer& Robert, L BERRY, Foundational of Ethics for Scientists &Engineers, Oxford University Press, 2000.
5. M. Govindrajran, S.Natrajan& V.S. Senthil Kumar, Engineering Ethics (including human Values), Eastern Economy Edition, Prentice hall of India Ltd.
6. B.L. Bajpai, 2004, Indian Ethos and Modern Management, New Royal book Co; Lucknow, 2004, Reprinted 2008.



CE 401: STRUCTURAL ANALYSIS– I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	2	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Determinate Structures:Statically determinate & indeterminate structures, static and kinematic indeterminacy, stability of structures, principle of superposition, Maxwell's reciprocal theorems; Computation of internal forces in statically determinate structures - plane truss, plane frame and grids.

Analysis of Statically Determinate Beams:Deflection of statically determinate beams - Macaulay's Method, Moment Area Method, Conjugate Beam Method.

UNIT-II

Deflection of Beams, Frames and Plane Truss by Strain Energy:Strain energy and complementary energy, strain energy due to axial loading, bending, transverse shear and torsion; applications to beams and frames;Clarke– Maxwell - Betti reciprocal theorem.

Virtual Work:Principal of virtual work, Unit load method, deflection of beams,frames and plane truss by unit load method.

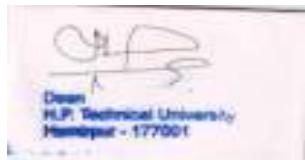
UNIT-III

Analysis of Arches: Three hinged circular and parabolic arches with supports at same and different levels, determination of normal thrust,radial shear and bending moment.

Analysis of Cables: Analysis of cables under point loads and UDL, length of cables for supports at same levels and at different levels.

UNIT - IV

Moving loads and Influence Lines:Introduction to moving loads - concept of influence lines - influence lines for reaction, shear force and bending moment in simply supported beams and over hanging beams; Muller Breslau principle - application to propped cantilevers - influence lines for forces in beams and trusses for different types of moving loads - concentrated load, uniformly distributed load shorter and longer than the span.

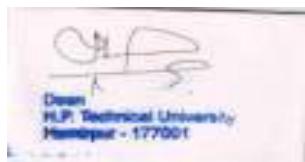


Text books:

1. Reddy C S, Basic structural Analysis, Tata McGrawHill, New Delhi.
2. Wang C.K., Intermediate Structural Analysis, McGraw Hill, New Delhi.
3. M.L. Gambhir, Fundamentals of structural Mechanics and analysis, Printice Hall India

Reference Books:

1. Kinney S., Indeterminate Structural Analysis, Oxford & IBH
2. Coates, Coutie and Kong , Structural Analysis, ELBS Publishers
3. Timoshenko S.P.& Young D.H., Theory of Structures, McGraw Hill
4. Harry H West & Louis F Geschwindner, Fundamentals of Structural Analysis, Wiley India Publishers



CE 402: GEOTECHNICAL ENGINEERING – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction: Introduction, origin and formation of soil, phase diagram, relationships and their inter - relationships; Determination of Index properties - specific gravity, water content, in-situ density, particle size analysis and sedimentation analysis, Atterberg's limits, relative density, thixotropy, activity and sensitivity; Classification of soils as per BIS and HRB and their applications in construction of highways, earthen dams etc., BIS Plasticity chart and its practical application.

Soil Structure and Clay Mineralogy: Single grained, honey combed, flocculent and dispersed structures; Valence bonds, Soil-Water system, Electrical diffuse double layer, adsorbed water, base-exchange capacity, Isomorphous substitution; Common clay minerals in soil and their structures- Kaolinite, Illite and Montmorillonite and their application in Engineering.

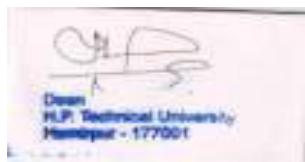
UNIT - II

Flow Through Soils: Darcy's law- assumption and validity, coefficient of permeability and its determination (laboratory and field), permeability of stratified soils, seepage velocity, superficial velocity and coefficient of percolation, quick sand phenomena, capillary phenomena; Application problems with respect to the analysis of dams and sub-base of roads; Seepage analysis -Laplace equation, assumptions, limitations and its derivation; Flow nets- characteristics and applications, flow nets for sheet piles and below the dam section.

Effective Stress: Introduction, geostatic stresses, effective stress concept-total stress, effective stress effect of water table, fluctuations of effective stress, effective stress in soil saturated by capillary action, neutral stress and impact of the effective stress in construction of structures.

UNIT - III

Consolidation of Soils: Introduction, comparison between compaction and consolidation, initial, primary & secondary consolidation, spring analogy for primary consolidation, Terzaghi's theory of consolidation, final settlement of soil deposits, consolidation settlement - one- dimensional method, secondary consolidation.



Primary and secondary compression for normally and over consolidated clays, consolidation of partially saturated soils, creep/secondary compression in soils.

UNIT - IV

Shear Strength of Soils: Concept of shear strength, typical response of soils to shearing forces - Effects of increasing the normal effective stress, over consolidation ratio in soils, drainage of excess pore water pressure, cohesion, tension and cementation; Mohr-Coulomb theory, concept of pore pressure, total and effective shear strength parameters, factors affecting shear strength of soils; Measurement of shear strength – Direct shear test, Unconfined compression test, Triaxial compression tests, Vane shear test, Test under different drainage conditions, Total and effective stress paths.

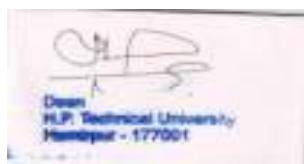
Stability of Slopes: Introduction, different factors of safety, types of slope failures, analysis of finite and infinite slopes, Swedish circle method, friction circle method, stability numbers and charts

Text Books:

1. Geotechnical Engineering; Braja, M. Das (2002), Fifth Edition, Thomson Business Information India (P) Ltd., India.
2. Soil Mechanics and Foundation Engineering - Purnima B C(2012) , Laxmi Publications

Reference Books:

1. Fundamentals of Soil Engineering by Taylor, John Wiley & Sons
2. An Introduction to Geotechnical Engineering, by Holtz R.D., Prentice Hall, NJ
3. Soil Mechanics by Craig R.F., Chapman & Hall.
4. Soil Mechanics, T.W. Lambe and R.V. Whitman, John Wiley & Sons, 1969.



Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Tacheometric Surveying: Classification, principal of stadia method, theory of anallatic lens, distance and elevation formulae, tangential method, errors in stadia surveying.

UNIT II

Simple, Compound, Reverse Curves and Vertical Curves:

- Simple Curves: Elements of simple curves, methods of curve ranging, obstacles in setting out curves.
- Compound Curves: Elements of compound Curves, setting out the curve.
- Reverse Curves: Elements of reverse Curves, setting out the curve.
- Vertical Curves: Elements of vertical curves, types, tangent correction, location of highest or lowest point.

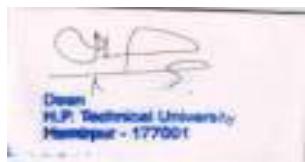
Transition Curves: Elements of transition curves, super elevation, length of transition curve, Ideal transition curve, characteristics of transition curve, setting out the transition curve.

UNIT III

Geodetic Surveying and Triangulation Adjustment Geodetic Surveying: Classification of triangulation survey, inter - visibility of stations, field work, reduction to centre, base line measurement, corrections.

Triangulation Adjustment: Definitions, weighted observations, principal of least square, laws of weights, station adjustment and figure adjustment (Triangle only).

Photographic Surveying: Basic definitions, terrestrial and aerial photography, scale of Aerialphoto relief, tilt and height displacements, heights from relief displacement and parallax measurements, flight planning, study of photo theodolite and stereoscope.



UNIT IV

Advanced Techniques in Surveying: Total station, electromagnetic distance measurement (EDM).

Remote Sensing: Introduction, definitions, remote sensing systems, advantages, basic principles, energy interaction in the atmosphere and with targets, Indian remote sensing satellite series and their characteristics.

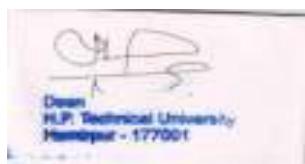
GIS & GPS: Components of geographical information system (GIS), advantages, function of GIS, raster and vector data, advantages and disadvantages, global positioning system (GPS), Introduction, definitions, GPS receivers, antenna, errors in GPS, advantages of GPS.

Text Books:

1. Surveying and Leveling, Vol I & II, III, B.C.Punmia ,Laxmi Publication
2. Surveying and Leveling, N.N.Basak, Tata McGraw Hill
3. Surveying & Levelling by Kanetkar&Kulkarni (Vol 2)
4. Remote sensing & G.I.S. by Dr. M. AnjiRddy

Reference Books:

1. Surveying, R Agor, Khanna Publishers
2. Concepts and Techniques of GIS, Lo C.P.Yeung A K W, Prentice Hall, India
3. Introduction to GIS, Kang-tsung Chang, Tata McGraw Hil



CE 404: BUILDING PLANNING AND CONSTRUCTION

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

PLANNING ASPECTS & REGULATIONS: Functional Planning of buildings: General aspects to consider for planning, bye-laws and regulations, Selection of site for building construction, Principles of planning, Orientation of building and its different elements, Components of building.

UNIT - II

Masonry: Definitions of terms used in masonry, Materials used, Stone masonry, Brick masonry, Different bonds used for brick masonry, Composite masonry.

Floors and Roofs: Components of a floor, materials used for floor construction, Different types offlooring, Ground floor and upper floors, Types of roofs, Basic roofing elements and Roof coverings.

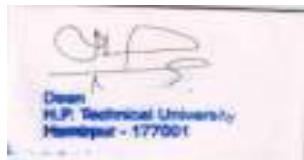
UNIT - III

Doors and Windows: Location of roofs and windows, Definition of technical terms, Size of doorsand windows, Door frames, Types of doors and windows, Ventilators, Fixtures and fastenings.

Damp proofing, Fire protection and Thermal insulation: Causes and effect of dampness on buildings, Materials and methods used for damp proofing; Fire hazards, Grading of buildings according to fire resistance, Fire resisting properties of common building materials, Fire resistant construction; General methods of thermal insulation and thermal insulating materials.

UNIT- IV

Building Services: Integration of services in buildings - water supply & plumbing layout for aresidential building - elevators & escalators - planning & installation – basiccomponents of the electrical system for a residence - typical electrical layoutdiagram. Lay out of external services -water supply- sewage disposal-electricalcabling.

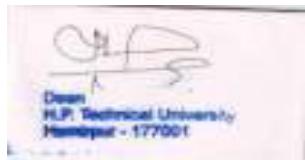


Text Books:

1. Varghese P. C. Building Construction, PHI Learning Pvt. Ltd., 2008.
2. Punmia B. C., Jain A. J. and Jain A. J. Building Construction, Laxmi Publications, 2005.
3. Arora S. P., and Bindra S. P. The text book of Building Construction, DhanpatRai Publications, 2010.

Reference Books:

1. Joseph De chiara& John Callendar – “Time saver standards for building types”, III Edition - McGraw Hill, 1990.
2. National Building Code, “Bureau of Indian Standars”, New Delhi, 2005.



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - GolakNath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

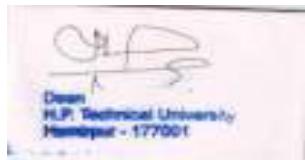
UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.

UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial review of administrative actions, exclusion of judicial review and concept of "Ombudsman";Right to Information Act, 2005 (Sub Section 1 - 20)



Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

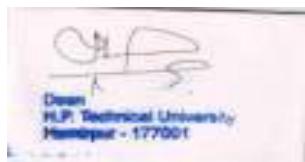
Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

1. D.D. Basu, Shorter Constitution of India, Prentice Hall of India, (1996)
2. MeenaRao, Fundamental concepts in Law of Contract, 3rd Edn. Professional Offset, (2006)
3. H.O.Agarwal,International Law and Human Rights, Central Law Publications, (2008)

Reference Books:

1. H.M. Seervai,Constitutional Law of India, Tripathi Publications, (1993).
2. S.K. Kapur, Human Rights under International Law and Indian Law, Central Law Agency, (2001)
3. NeelimaChandiramani, The Law of Contract: An Outline, 2nd Edn. Avinash Publications Mum, (2000)
4. Avtarsingh, Law of Contract, Eastern Book Co., (2002).
5. Anson W.R.(1979), Law of Contract, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verbenmituntrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

Wichtige Sprachhandlungen: Kleidung, Farben, Materialien.

Grammatik: formelle Imperativsätze mit "Sie" informelle Imperativsätze Vorschläge mit "wir" – "sollen/wollen wir" - Sollich? Modalpartikeln "doch" "mal" "doch mal".

UNIT - III

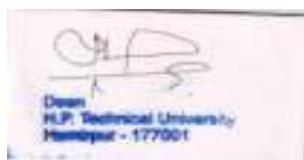
Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ "alle", "man" Indefinitepronomen "etwas", "nichts".

UNIT - IV

Wichtige Sprachhandlungen: Essen und Trinken im Restaurant, Partyvorbereitung und Feier.

Grammatik: Nomen aus Adjektiven nach "etwas" und "nichts" Nomen aus dem Infinitiv von Verben, zusammengesetzte Nomen und ihre Artikel. Adjektive im Nom. und Akk. nach unbestimmten Artikel, Negativartikel und Possessivartikel.

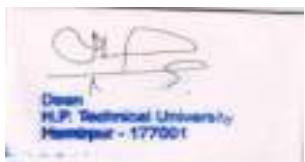


TEXT BOOK

1. Studio d A1. Deutsch als Fremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

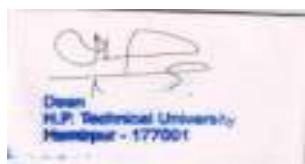
Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.

UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.



UNIT - IV

Grammar and Vocabulary –the verbs: manger, boire, the partitive articles

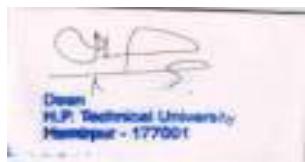
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading –reading a text.

TEXT BOOK

1. Tech French

REFERENCES

1. French for Dummies.
2. French made easy: Goyal publishers.
3. Panorama.

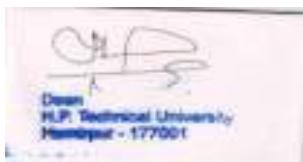


CE 407 GEOTECHNICAL ENGG. LAB -I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	2 hrs

Note: A minimum eight practical's to be performed out of following:

1. Field Density using Core Cutter method.
2. Field Density using Sand replacement method.
3. Natural moisture content using Oven Drying method.
4. Field identification of Fine Grained soils.
5. Specific gravity of Soil grains.
6. Grain size distribution by Sieve Analysis.
7. Grain size distribution by Hydrometer Analysis.
8. Consistency limits by Liquid limit, Plastic limit and Shrinkage limit.
9. Permeability test using Constant Head test method / Falling Head method.
10. Compaction test: Standard Proctor test/ Modified Proctor test.
11. Relative density.
12. Consolidation Test.
13. Triaxial Test (UU)
14. Direct Shear Test.
15. Unconfined Compression Strength Test.
16. California Bearing Ratio.



CE 408: ENIGINEERING SURVEYING LAB –II

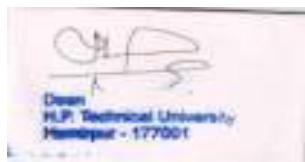
Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	3	2	30	20	50	2 hrs

Note: A minimum eight practicals to be performed out of following List:

List of Experiments:

1. Determination of constants of Tacheometer
2. Determination of elevation of points by Tacheometric surveying
3. Determination of elevation of points and horizontal distance between them by Tacheometric survey.
4. Determination of gradient of given length of road by Tacheometric survey
5. Setting out of simple circular curve by offsets from chord produced and Rankine method
6. Setting out of simple transition curve by tangential angle method
7. Use of Total Station.
8. Study of Toposheets.
9. SURVEY PROJECT: Survey project should be carried out for minimum 2 days in any one of the following areas:
 - a. Road Project,
 - b. Irrigation Project (canal alignment, watershed demarking, contouring)
 - c. Water Supply Project

After completion of survey, students have to complete profile, cross-section and volume calculation (Cut & Fill) using appropriate software wherever required.



CE 410: COMPUTER AIDED BUILDINGB DRAWING LAB

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	2 hrs

Objectives:

- To make the students aware about the basic principles of Building Drawing
- To make the students to know Basic commands of a popular drafting package
- Make the students to draw plan, elevation and section of building using Auto CAD

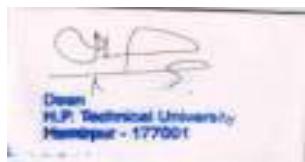
Note: A minimum six drawings must be made out of followinglist:

List of Drawings:

1. Getting started with AutoCAD.
2. Understanding the basic commands.
3. Executing Electric drawings.
4. Executing Mechanical drawings.
5. Drawing a civil engineering structures with design notations.
6. Drawing various building plans and elevations.
7. Drawing panelled doors, glazed windows and ventilators in wood
8. Drawing roof truss in structural steel sections
9. Executing a spiral stair case in 3D.

Reference Books:

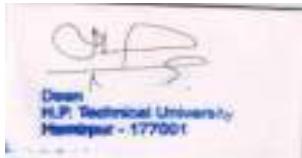
1. AutoCAD Manual.
2. Balagopal T.S. Prabhu, Building drawing and detailing, Spades Publishers
3. Shah &Kale,Building Drawing, Tata McGraw Hill
4. B.P. Verma, Civil Engineering Drawing and housing Planning, Khanna Publishers.



D. DETAILED SYLLABI OF COURSES

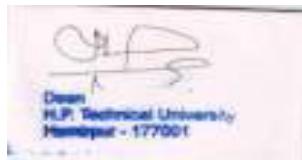
SCHEME OF TEACHING AND EXAMINATION COMPUTER SCIENCE & ENGINEERING										
SEMESTER – III										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	CS-301	Data Structures	3	1	0	4	40	60	100
4	PC	CS-302	Object Oriented Programming using C++	3	1	0	4	40	60	100
5	PC	EC-302	Digital Electronics	3	1	0	4	40	60	100
6	PC	CS-303	Computer Architecture & Organization	3	0	0	3	40	60	100
7	OE	-	Open Elective – I	2	0	0	2	40	60	100
Labs:										
1	PC	CS-311	Data Structures Lab	0	0	2	1	30	20	50
2	PC	CS-312	C++ Programming Lab	0	0	2	1	30	20	50
3	PC	EC-306	Digital Electronics Lab	0	0	2	1	30	20	50
			Total	18	6	6	24+2			

OPEN ELECTIVE I										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	OE	HS-306	Sociology & Elements of Indian History for Engineers	2	0	0	2	40	60	100
2	OE	HS-307	German Language - I	2	0	0	2	40	60	100
3	OE	HS-308	French Language – I	2	0	0	2	40	60	100



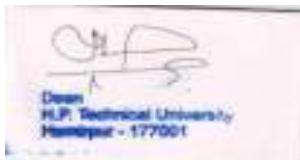
SCHEME OF TEACHING AND EXAMINATION COMPUTER SCIENCE & ENGINEERING										
SEMESTER – IV										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Human Values and Professional Ethics	2	2	0	3	40	60	100
3	PC	CS-401	Database Management System	3	0	0	3	40	60	100
4	PC	CS-402	Operating System	3	1	0	4	40	60	100
5	PC	CS-404	Theory of Computation	3	1	0	4	40	60	100
6	PC	EC-402	Microprocessor & Peripherals	3	1	0	4	40	60	100
7	OE	-	Open Elective -II	2	0	0	2	40	60	100
Labs:										
1	PC	CS-411	Database Management System Lab	0	0	2	1	30	20	50
2	PC	EC-405	Microprocessor & Peripherals Lab	0	0	2	1	30	20	50
3	MC		Field Visit Viva-Voce	0	0	2	1	30	20	50
			Total	18	6	6	24+2			

OPEN ELECTIVE II										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	OE	HS-410	Law for Engineers	2	0	0	2	40	60	100
2	OE	HS-411	German Language - II	2	0	0	2	40	60	100
3	OE	HS-412	French Language – II	2	0	0	2	40	60	100



SCHEME OF TEACHING AND EXAMINATION <u>B.TECH COMPUTER SCIENCE & ENGINEERING</u>										
SEMESTER – V										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PC	CS-501	Computer Networks	3	1	0	4	40	60	100
2	PC	CS-502	Core Java	3	0	0	3	40	60	100
3	PC	CS-503	Computer Graphics	3	1	0	4	40	60	100
4	PC	CS-504	Artificial Intelligence & Expert Systems	3	0	0	3	40	60	100
5	PC	CS-505	Software Engineering	3	1	0	4	40	60	100
6	PC	CS-506	Analysis and Design of Algorithm	3	1	0	4	40	60	100
7	OE		Open Elective -III	2	0	0	2	40	60	100
Labs:										
1	PC	CS-511	Computer Networks Lab	0	0	2	1	30	20	50
2	PC	CS-512	Core Java Lab	0	0	2	1	30	20	50
3	MC									
			Total	20	1	6	24+2			

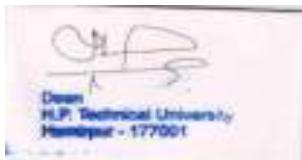
OPEN ELECTIVE – III (FOR STUDENTS OF OTHER DEPARTMENT)		
S. N.	Course Code	Subject
1		
2		
3		



SCHEME OF TEACHING AND EXAMINATION B.TECH COMPUTER SCIENCE & ENGINEERING										
SEMESTER – VI										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	CS-601	Advanced Java	3	0	0	3	40	60	100
2	PC	CS-602	Enterprise Resource Planning	3	0	0	3	40	60	100
3	PC	CS-603	Compiler Design	3	1	0	4	40	60	100
4	PC	CS-604	Linux Administration	3	1	0	4	40	60	100
5	PC	CS-605	Data Mining & Data Warehousing	3	1	0	4	40	60	100
6	PC	CS-606	Multimedia Technology	3	0	0	3	40	60	100
7	PE	-	Programme Elective – I	3	0	0	3	40	60	100
Labs:										
1	PC	CS-611	Advanced Java Lab	0	0	2	1	30	20	50
2	PC	CS-612	Linux Admin Lab	0	0	2	1	30	20	50
3	MC	CS-613	Seminar	0	0	2	1	30	20	50
			Total	20	0	8	24+3			

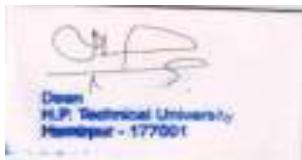
PROGRAMME ELECTIVE - I		
S. N.	Course Code	Subject
1	CS-621	PC Maintenance & Troubleshooting
2	CS-622	Distributed Operating System
3	CS-623	Management Information Systems

Industrial /Practical Training after VI Semester of six weeks duration



SCHEME OF TEACHING AND EXAMINATION B.TECH COMPUTER SCIENCE & ENGINEERING										
SEMESTER – VII										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	CS-701	Advance Computer Architecture	3	1	0	4	40	60	100
2	PC	CS-702	Wireless & Mobile Communication	3	1	0	4	40	60	100
3	PC	CS-703	Information System Securities.	2	2	0	3	40	60	100
4	PC	CS-704	Cloud Computing	3	1	0	4	40	60	100
5.	PE		Programme Elective-II	3	0	0	3	40	60	100
Labs:										
1	MC	CS-711	Project Work -I	0	0	4	2	30	20	50
2	PC	CS-712	Industrial /Practical Training(Viva-Voce)	0	0	4	2	30	20	50
3	PC	CS-713	System & Network Administration Lab	0	0	2	1	30	20	50
			Total	15	0	10	20+3			

PROGRAMME ELECTIVE-II		
S. N.	Course Code	Subject
1	IT-701	Current Trends & Technologies
2	CS-722	Embedded Systems
3	CS-723	Web Technology

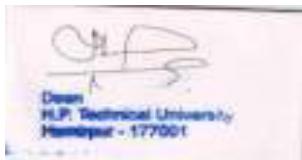


SCHEME OF TEACHING AND EXAMINATION <u>B.TECH COMPUTER SCIENCE & ENGINEERING</u>										
SEMESTER – VIII										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PE		Programme Elective - III	3	0	0	3	40	60	100
2	PE		Programme Elective - IV	3	0	0	3	40	60	100
3	MC		Project Work - II	0	0	16	8	40	60	100
			Total	6	0	24	8 + 6+14			
OR										
4	MC		Industrial Project	0	0	16	8	40	60	100
			Total	0	0	24	8 + 6=14			

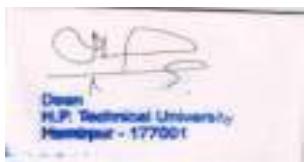
PROGRAMME ELECTIVE-III		
S. N.	Course Code	Subject
1	CS-811	Wireless Sensors & Adhoc Networks
2	CS-812	Distributed Computing
4	CS-813	Soft Computing

PROGRAMME ELECTIVE-IV		
S. N.	Course Code	Subject
1	IT-811	Mobile Application Development
2	IT-812	Natural Language Processing
3	IT-813	Cyber Security & Cyber Laws

Note: Industrial Project of Fourmonths duration is to be carried out by the student exclusively in industry under the joint supervision of faculty advisers from institution as well as from the industry.



SEMESTER-III



MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties -Function of Random variables.

UNIT – III

Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

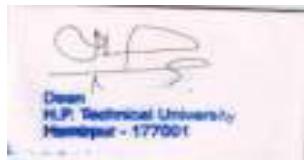
UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

Text Books:

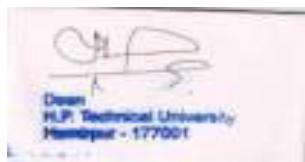
4. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
5. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.



6. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers", 5th Edition, 2011.

Reference books:

4. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearson Education, Delhi, 2002.
5. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
6. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists" 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics: Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

UNIT - II

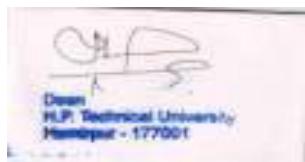
Value Analysis: Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.

Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages, incentives, recruitment, training and industrial relations.



UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet, break evenanalysis –

basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketingenvironment, marketing mix, advertising and sales promotion.

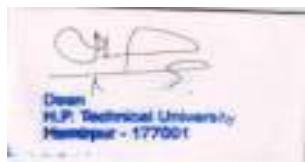
Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

Text Books:

3. PanneerSelvam, R, "*Engineering Economics*", Prentice Hall of India Ltd, New Delhi.
4. Dwivedi, D.N., "*Managerial Economics, 7/E*", Vikas Publishing House.

Reference Books:

11. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., "*Engg. Economy 15/E*",Prentice Hall, New York, 2011.
12. Chan S. Park, "*Contemporary Engineering Economics*", Prentice Hall of India, 2002.
13. F. Mazda, *Engg.Management*, Addison Wesley, Longman Ltd., 1998.
14. O. P. Khanna, *Industrial Engg.and Management*,DhanpatRai and Sons, Delhi, 2003.
15. P. Kotler, *Marketing Management, Analysis, Planning, Implementation and Control*,Prentice Hall, New Jersey, 2001.
16. VenkataRatnam C.S & Srivastva B.K, *Personnel Management and Human Resources*, Tata McGraw Hill.
17. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill.
18. Bhattacharya A.K., *Principles and Practice of Cost Accounting*, Wheeler Publishing.
19. Weist and Levy, *A Management guide to PERT and CPM*, Prantice Hall of India.
20. Koontz H.,O'Donnell C.,&Weihrich H, *Essentials of Management*, McGraw Hill.



CS-301 DATA STRUCTURE

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Course objective: To familiarize the students with various data structures & algorithms used in computer programming.

UNIT-I

Data Structures: Definition, Primitive and Derived Data Types, Abstract Data Types, Need for Data Structures, Types of Data Structures.

Algorithm: Definition, Characteristics, Development of Algorithm, Analysis of Complexity:- Time Complexity, Space Complexity, Order of Growth, Asymptotic Notation with example, Obtaining the Complexity of Algorithm.

Arrays: Definition, 1D and 2D arrays, Operations on Arrays, Sparse Matrices, Structures and Arrays of Structures.

UNIT-II

Linked list: Representation of Linked List in Memory, Allocation & Garbage Collection, Operations on Linked List, Doubly Linked Lists, Circular Linked List, Linked List with Header Node, Applications.

Stacks: Representation of Stack in Memory, Operations on Stack and Applications.

Queues: Representation of Queues in Memory, Operations on Queues, Circular Queues, Double Ended Queues, Priority Queues, Applications.

UNIT-III

Trees: Introduction, Representation of Tree in Memory.

Binary Trees: Terminology, Binary Tree Traversal, Binary Search Tree, Insertion, Deletion & searching in Binary Search Tree, Heap Trees, Types of Heap Trees, Insertion, Deletion in Heap Tree with example, Heap Sort Algorithm, Introduction of AVL Trees & B-Trees.

Graphs: Definition, Representation of Graph (Adjacency Matrix, Adjacency List), Traversing a Graph (DFS & BFS), Dijkstra's Algorithm for Shortest Distance, Minimum Spanning tree.

UNIT-IV

Searching and sorting: Need for Searching and Sorting, Linear and Binary search, Insertion Sort, Selection Sort, Merge Sort, Quick Sort, Radix Sort and Bubble Sort.

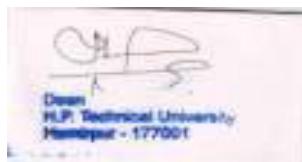
Hash Tables: Introduction, Hash Function, Collision Resolution Techniques in Hashing, Deletion from Hash Table.

TEXT BOOKS:

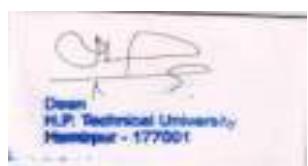
1. Seymour Lipschutz : *Theory and practice of Data structure* , Tata Mc. Graw Hill 1998
2. Tenebaum , A. Lanhgsam Y and Augensatein , A. J: *Data structures using C++* , Prentice Hall of India.

REFERENCE BOOKS:

1. *Data structure and Algorithms in C++* by Micheal T. Goodrich, Wiley India publication.
2. *Data structures*, R.Venkatesan, S.Lovelyn Rose, Wiley India publication.
3. *Data Structure using C++* By Patil , Oxford University press.
4. *Data Structure , Algorithm and Object-Oriented programming* , Gregory L. Heileman, Tata Mc-Graw Hills.



5. S. Sahni , “Data structure Algorithms ad Applications in C++”, WCB/McGraw Hill.
6. J.P. Tremblay and P.G. Sorenson, “An Introduction to Data Structures with applications”, Tata McGraw Hill.



CS-302 OBJECT ORIENTED PROGRAMMING USING C++

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Course Objective: This course is designed to explore computing and to show students the art of computer programming. Students will learn some of the design principles for writing good programs.

UNIT-I

Review of basic concepts of object-oriented programming, Comparison between procedural programming paradigm and object-oriented programming paradigm.

Classes and Objects: Specifying a class, Creating class objects, Accessing class members, Access specifiers – public, private, and protected, Classes, Objects and memory, Static members, The const keyword and classes, Static objects, Friends of a class, Empty classes, Nested classes, Local classes, Abstract classes, Container classes, Bit fields and classes.

Console Based I/O: Concept of streams, Hierarchy of console stream classes, Input/Output using Overloaded operators `>>` and `<<` and Member functions of I/O stream classes, Formatting Output, Formatting using `ios` class functions and flags, Formatting using manipulators.

UNIT-II

Constructors and Destructors: Need for constructors and destructors, Copy constructor, Dynamic constructors, Destructors, Constructors and destructors with static members, Initializer lists.

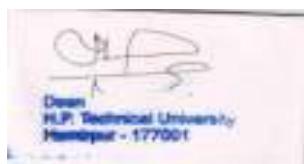
Operator Overloading and Type Conversion: Defining operator overloading, Rules for overloading operators, Overloading of unary operators and various binary operators, Overloading of new and delete operators, Type conversion - Basic type to class type, Class type to basic type, Class type to another class type.

Inheritance: Introduction, Defining derived classes, Forms of inheritance, Ambiguity in multiple and multipath inheritance, Virtual base class, Object slicing, overriding member functions, Object composition and delegation, Order of execution of constructors and destructors.

UNIT-III

Pointers and Dynamic Memory Management: Understanding pointers, Accessing address of a variable, Declaring & initializing pointers, Accessing a variable through its pointer, Pointer arithmetic, Pointer to a pointer, Pointer to a function, Dynamic memory management - `new` and `delete` Operators, Pointers and classes, Pointer to an object, Pointer to a member, `this` Pointer, Self-referential classes, Possible problems with the use of pointers - Dangling/wild pointers, Null pointer assignment, Memory leak and allocation failures.

Virtual Functions and Polymorphism: Concept of Binding - Early binding and late binding, Virtual functions, Pure virtual functions, Abstract classes, Virtual destructors & polymorphism.



UNIT-IV

Exception Handling: Review of traditional error handling, Basics of exception handling, Exception handling mechanism, Throwing mechanism, Catching mechanism, Re-throwing an exception, Specifying exceptions.

Templates and Generic Programming: Function templates, Class templates, Class templates and nontype parameters, Templates and inheritance, Templates and friends, Templates and Static members.

Managing Data Files: File streams, Hierarchy of file stream classes, Error handling during file operations, Reading/Writing of files, Accessing records randomly, Updating files, Data formatting in memory buffers.

Text Books:

1. *Lippman, S.B. and Lajoie, J., C++Primer, Pearson Education (2005) 4th ed..*
2. *Stroustrup, Bjarne, The C++ Programming Language, Pearson Education (2000) 3rd ed.*
3. *Kanetkar Y., Let Us C++, BPB Publications, 2nded.*
4. *Balaguruswamy E., Object Oriented Programming with C++, McGraw Hill, 2013.*

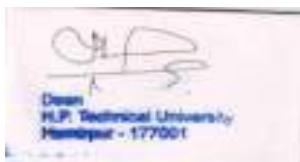
Reference Books:

1. *Eills, Margaret A. and Stroustrup ,Bjarne, The Annotated C++ Reference Manual, Pearson Education (2002).*
2. *Rumbaugh, J.R., Premerlani, W. and Blaha, M., Object Oriented Modeling and Design with UML, Pearson Education (2005) 2nd ed.*
3. *Kanetkar, Yashvant, Let us C++, Jones and Bartlett Publications (2008) 8th ed.*
4. *Brian W. Kernighan, Dennis M. Ritchie, The C++ Programming Language, Prentice Hall)*
5. *Schildt H., C++: The Complete Reference, Tata Mcgraw Hill, 2003.*

Course Learning Outcomes (CLO):

On completion of this course, the students will be able to

- a) Write, compile and debug programs in C++ language.
- b) Use different data types, operators and console I/O function in a computer program.
- c) Design programs involving decision control statements, loop control statements and case control structures.
- d) Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
- e) Comprehend the concepts of structures and classes: declaration, initialization and implementation.
- f) Apply basics of object oriented programming, polymorphism and inheritance.
- g) Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.



EC-302 DIGITAL ELECTRONICS

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Number system & codes

Binary arithmetic (Addition, Subtraction, Multiplication and Division), Floating point numbers. Diminished radix and radix compliments, BCD codes, 8421 code, Excess-3 code, Gray code, Error detection and correction: Parity code, Hamming code.

Logic gates

Positive & negative logic, Tristate logic gates, Schmitt gates, Totem pole output and open collector output; Fan in and Fan out of logic gates, Buffer & trans-receivers, IEEE/ANSI standards symbols.

UNIT-II

Boolean algebra simplification techniques

Sum of products and product of sums simplification, NAND and NOR implementation, Incompletely specified functions, Ex-OR functions, The map method: Two, Three, Four and Five variable maps; The tabulation method, Determination of prime implicants, Selection of essential prime implicants.

Logic families

Classification of digital IC's, Significance & types, Characteristics parameters, TTL, ECL, CMOS logic families, NMOS & PMOS logic, Interfacing between TTL & CMOS.

UNIT-III

Combinational logic circuits

Implementing combinational logic, Arithmetic circuits: Half adder, Full adder, Half subtractor, Full subtractor; Multiplexer, Encoder, Demultiplexer & Decoder.

Flip flops

Introduction, S-R flip-flops, Level & edge triggered flip flops, JK flip-flop, D flip-flop, T flip-flop, Master slave JK flip-flop, Flip flop timing parameters & applications.

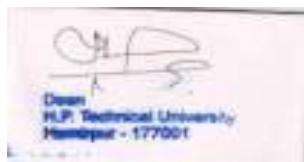
UNIT-IV

Shift Registers

Shift register, Ring counter, Universal shift registers, SISO, PISO, SIPO & PIPO.

Counters

Asynchronous ripple counter, Synchronous counter, Modulus of a counter, Binary ripple counter, Up & down, Decade counter.



Semiconductor Memories

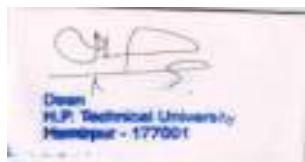
Classification of memories, ROM, RAM, Static memory and Dynamic memory. Programmable logic arrays, Charged-coupled device memory

Text Books

1. Digital Electronics -Principle & Integrated circuits, Anil K Maini, Wiley India edition
2. Modern Digital Electronics, R.P.Jain, TMH
3. M. Morris Mano, Digital Design, Prentice Hall of India.

Reference Books

1. Digital Principle and Applications, Malvino and Leach, TMH
2. Digital Electronics, Kharate, Oxford University Press



CS-303 COMPUTER ARCHITECTURE AND ORGANIZATION

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Course objective: Focus is on the architecture and organization of the basic computer modules viz controls unit, central processing unit, input-output organization and memory unit. Cover basics of computer arithmetic and parallel processing concepts.

UNIT-I

Basics of Digital Electronics: Codes, Logic gates, Flip flops, Registers, Counters, Multiplexer, Demultiplexer, Decoder, Encoder.

Register Transfer and Micro operations: Register transfer Language, Register transfer, Bus & memory transfer, Logic micro operations, Shift micro operation.

Computer Arithmetic: Unsigned, Signed and Floating point data representation, Addition, subtraction, Multiplication and Division algorithms. Booths multiplication algorithm.

UNIT-II

Basic Computer Organization: Instruction codes, Computer instructions, Timing & control, Instruction Cycles, Memory reference instruction, Input/Output& Interrupts, Complete computer description & design of basic computer.

Control Unit: Hardwired vs. Micro programmed control unit.

Central Processing Unit: General register organization, Stack organization, Instruction format, Addressing Modes, Data transfer & manipulation, Program control, RISC, CISC.

UNIT-III

Input-Output Organization: Peripheral devices, I/O interface, Modes of data transfer: Programmed I/O, Interrupt-Initiated I/O, DMA transfer, I/O processor. Serial Communication.

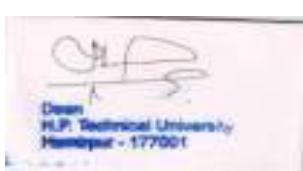
Memory Unit: Memory hierarchy, Processor vs. memory speed, Main Memory, Auxiliary Memories, High-speed memories, Cache memory, Associative memory, Virtual memory, and Memory management hardware.

UNIT-IV

Introduction to Parallel Processing: Flynn's Classification, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Characteristics of multiprocessors, Interconnection structures, Interprocessor arbitration, Interprocessor communication & synchronization.

Performance evaluation SPEC marks LINPACK Whetstone Dhrystone etc., Transaction processing benchmarks.

Case Studies: Case studies of some contemporary advanced architecture for processors of families like Intel, AMD, IBM etc./Seminar on State-of the-art technology.



Text Books:

1. Mano, Morris M., *Computer System Architecture*, Prentice Hall
2. Hayes, J.P., *Computer Architecture and Organization*, McGraw Hill

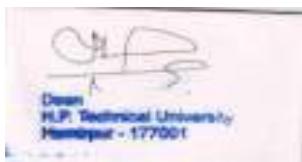
Reference Books:

1. Hennessy, J.L., Patterson, D.A, and Goldberg, D., *Computer Architecture A Quantitative Approach*, Pearson Education Asia
2. Leigh, W.E. and Ali, D.L., *System Architecture: software and hardware concepts*, South Wester Publishing Co.

Course learning outcome (CLO):

On completion of this course, the students will be able to

- a) understand basics of digital electronics such as Flip flops, Registers, Counters, Multiplexer, Demultiplexer, Decoder, Encoder etc.
- b) understand basic concepts of computer architecture including, syntax of register transfer language, micro operations, instruction cycle, and control unit.
- c) design and analyze the instruction format & addressing modes for a given operation and algorithms for addition, subtraction, multiplication & division.
- d) understand and analyze various memory management techniques like associate memory, cache memory, virtual memory etc. and understand interfacing of computer with input and output devices.
- e) understand the concept of pipelining, multiprocessors, and inter processor communication and hence evaluation of different contemporary advanced architectures.



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT - I

Introduction to sociological concepts - structure, system, organization, social institution, Culture, social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT -II

Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

UNIT -III

Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.

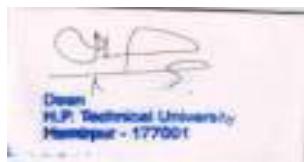
UNIT - IV

From feudalism to colonialism - the coming of British; Modernity and struggle for independence.

Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India 2nd phase (LPG decade post 1991)

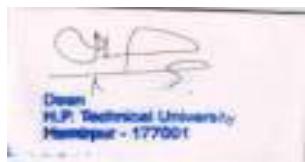
Text Books:

4. Desai, A.R. (2005), Social Background of Indian Nationalism, Popular Prakashan.
5. Giddens, A (2009), Sociology, Polity, 6th Edition.
6. Chandoke, Neera & Praveen Priyadarshi (2009), Contemporary India: Economy, Society and Politics, Pearson.



Reference Books:

5. Guha, Ramachandra(2007), India After Gandhi, Pan Macmillan.
6. Haralambos M, RM Heald, M Holborn (2000), Sociology, Collins.
7. Sharma R. S..(1965), Indian feudalism, Macmillan.
8. Gadgil, Madhab&RamchandraGuha(1999) - This Fissured Land: An Ecological History of India, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offer opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßigeVerbenimPräsens - “sein” und habenimPräsens -PersonalpronomenimNominativ.

UNIT- II

WichtigeSprachhandlungen: TelefonNummernverstehen und sprechenUhrzeitenverstehen und sagenVerneinung “nicht und kein” (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notierenbestimmter und unbestimmterArtikelundNegativartikelim Nom. &Akkusativ

UNIT- III

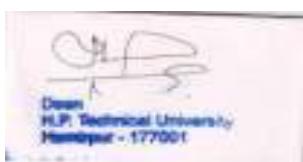
WichtigeSprachhandlungen: Tageszeitenverstehen und überTermingesprechen-Verabredungenverstehen - AufgabenimHaushaltverstehen

Grammatik: PersonalpronomenimAkkusativ und Dativ - W-Fragen “wie, wer, wohin, wo, was usw.-GenitivbeiPersonennamen - ModalverbenimPräsens “können, müssen, möchten”

UNIT- IV

WichtigeSprachhandlungen: Sichaustauschen, was man kann, muss –BezeichnungenLebensmittel – Mengenangabenverstehen – PreiseverstehenundEinkaufzettelschreiben

Grammatik: Wortstellung in SätzenmitModalverben – Konnektor ”und” – “noch”-kein-----mehr – “wieviel, wieviele, wie alt, wie lange” –PossessivartikelimNominativ.



UNIT V

WichtigeSprachhandlungen:Freizeitanzeigenverstehen

HobbysundSportartenAnzeigenfürFreizeitpartnerschreibenbzw. daraufantworten –Vorlieben und
Abneigungenausdrucken.

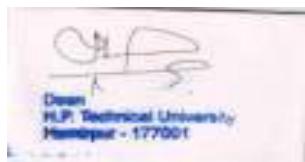
Grammatik:VerbenmitVokalwechselimPräsens – ModalverbenimPräsens “dürfen, wollen und mögen - “haben und sein” imPräteritum – regelmäßigeVerbenimPerfekt – Konnektoren “denn, oder, aber.

TEXT BOOK

1. Studio d A1. Deutsch alsFremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offer opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verb of self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the French alphabet and the accents that play a vital role in the pronunciation of the words.

Writing: Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subjectpronouns.

Listening and Speaking: Pronunciation of words like Isabelle, presentez and la liaison – vous êtes, vousappelez and role play of introducing each other – group activity.

Writing: Particulars in filling an enrolment / registration form.

Reading Comprehension: reading a text of a famous scientist and answering questions.

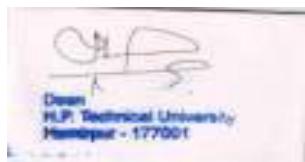
UNIT – III

Grammar and Vocabulary: Verb of possession “avoir” and 1st group verbs “er”, possessive adjectives and pronouns of insistence- moi, lui..and numbers from 0 to 20.

Listening and Speaking: Nasal sounds of the words like feminine, ceinture, parfum and how to ask simple questions on one’s name, age, nationality, address, mail id and telephone number.

Writing: Conjugations of first group verbs and paragraph writing on self – introduction and introducing a third person.

Reading Comprehension: reading a text that speaks of one’s profile and answering questions



UNIT – IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb “aimer” and seasons of the year and leisure activities.

Listening and Speaking: To express one’s likes and dislikes and to talk of one’s pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing-Conjugations of the irregular verbs: faire and savoir and their usage. Paragraph writing on one’s leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one’s way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs, a droite, la premiere a gauche and vocabulary relating to accommodation.

Listening and Speaking: To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing: Paragraph writing describing the accommodation using the different prepositions like en face de, derrière- to locate.

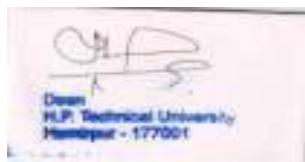
Reading Comprehension: A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliothèque?.....

TEXT BOOK

1. Tech French

REFERENCES

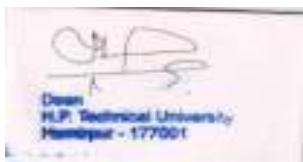
1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



CS-311 DATA STRUCTURE LAB

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

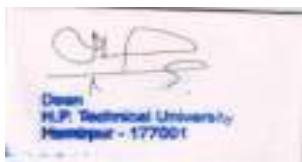
1. Write recursive programme which computes the nth Fibonacci number
2. Write recursive programme which computes the factorial of a given number.
3. Write a program to implement linear search using arrays
4. Write a program to implement binary search using arrays
5. Write c program to implement bubblesort, to sort a given list of integers in ascending order.
6. Program to implement insertion sort to sort a given list of integers in ascending order.
7. program to implement INSERTION SORT to sort a list of numbers
8. Write a C program that implement mergesort, to sort a given list of integers in ascending order.
9. Write C programs that implement stack using arrays
10. Write C programs that implement stack using linked list Program
11. Write c programs that implement Queue using array
12. Write C programs that implement Queue using linked lists.
13. Write program to implement linked list operations (Creation, Insertion, Deletion, reversing).
14. Write a program to implement binary tree
15. Write a program to implement heap sort using arrays



CS-312C++ Programming Lab

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

1. Write a program in C++ to exchange the content of two variables using call by reference
2. Write a program in C++ to search the 2nd largest & smallest element in an array.
3. Write a C++ program to implement a student class having roll no., name, rank, addresses as data members.
4. Write a program in C++ demonstrating the Static Data member.
5. Write a program in C++ demonstrating the public, protected and private parameters.
6. Write a program in C++ to demonstrate constructor with default argument.
7. Write a program in C++ to demonstrate the Constructor Overloading, assume desired parameters.
8. Write a program in C++ to create the class shape, and overload the function to return the perimeters of the different shapes.
9. Write a program in C++ to demonstrate destructor in inheritance.
10. Write a program in C++ to demonstrate multiple inheritance.
11. Write a program in C++ to demonstrate multilevel inheritance.
12. Write a program in C++ to demonstrate public, private and protected inheritance.
13. Write a program in C++ to demonstrate virtual function.
14. Write a program in C++ to demonstrate friend function.
15. To demonstrate function overriding.
16. Write a program in C++ to copy & append the content of file into another. (Assume suitable data)
17. Write a C++ program implement a class 'Complex' of complex numbers. The class should be include member functions to add and subtract two complex numbers. .
18. Write a C ++ program to implement matrix class. Add member function to transpose the matrix.
19. Write a C ++ program to implement a class for complex numbers with add and multiply as member functions. Overload ++ operator to increment a complex number.



EC-306 DIGITAL ELECTRONICS LAB

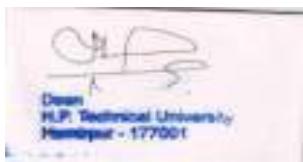
Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Digital Electronics lab.’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

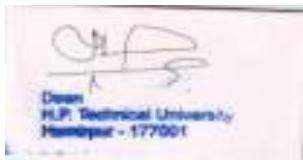
List of Experiments:

1. To verify the truth table of logic gates realize AND, OR, NOT gates
2. To realize AND, OR gates using diodes and resistors
3. Implementation of X-OR and X-NOR using NAND and NOR gates.
4. Design of a digital circuit using K-map and realise by using NAND-NAND or NOR-NOR gates.
5. Design of an adder logic circuit.
6. Design of a subtractor logic circuit.
7. Implementation of logic equations using MUX, DEMUX
8. Design of an encoder logic circuit.
9. Design of a decoder logic circuit.
10. Conversion from one flip flop to another.
11. Design of a counter and its realization using FFs.
12. Design of a shift register and its realization using FFs.
13. Design BCD to seven-segment display using 7447 IC

NOTE: The above experiments may also be performed on simulation software



SEMESTER-IV



MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

UNIT – II

Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.

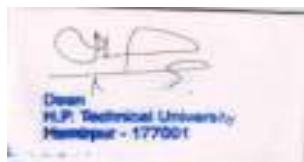
UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.

Approximation methods for nonlinear programming: Line search methods, gradient methods, conjugate gradient methods; Networking techniques – PERT and CPM.

UNIT - IV

Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and its role in minimization, minimization



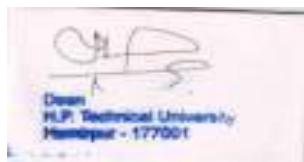
under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

5. C. B. Gupta, "Optimization Techniques in Operation Research," I. K. International Publishing House Pvt. Ltd.
6. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
7. Mukesh Kumar Singh, "Calculus Of Variations" Krishna Prakashan Media (P) Ltd.
8. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

6. I. M.Gelf and S. V. Fomin, "Calculus of Variations" Dover Publications IncMineola,New York.
7. Purna Chand Biswal, "Optimization in Engineering, Scitech Publications India Pvt. Ltd.
8. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
9. G. Hadly, Linear Programming, Narosa Publishing House.
10. KantiSwarup, P. K. Gupta and Manmohan, "Operations Research," Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

1. Understanding the need , basic guidelines, content and process of value Education
2. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

1. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
2. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
3. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
4. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

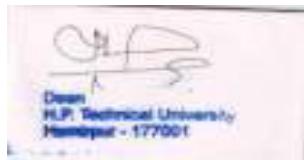
1. Understanding human being as a co-existence of the self and the body.
2. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
3. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

1. Understanding the characteristics and activities of ‘I’ and harmony in ’I’
2. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.

UNIT V: Harmony in Family, Society and Nature

1. Understanding harmony in the family, society and nature.



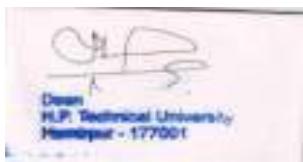
2. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.
3. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

1. R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).
2. R R Gaur, R Sangal and G P Bagaria, Teacher's Manual (English), 2009.

Reference Books

1. E.F. Schumacher, Small is Beautiful; a study of economics as if people mattered, Blond & Briggs, Bratain, 1973.
2. PL Dhar, RR Gaur, Science and Humanism, common wealth publishers, 1990.
3. A.N. Tripathy, Human values, New Age International Publishers, 2003.
4. E.G. Seebauer& Robert, L BERRY, Foundational of Ethics for Scientists &Engineers, Oxford University Press, 2000.
5. M. Govindrajran, S.Natrajan& V.S. Senthil Kumar, Engineering Ethics (including human Values), Eastern Economy Edition, Prentice hall of India Ltd.
6. B.L. Bajpai, 2004, Indian Ethos and Modern Management, New Royal book Co; Lucknow, 2004, Reprinted 2008.



CS-401 DATABASE MANAGEMENT SYSTEMS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Course objective: To familiarize the students with Data Base Management system.

UNIT-I

Introduction: Concept & Overview of DBMS, Data Models, Database Languages, Database Administrator, Database Users, Three Schema architecture of DBMS.

Entity-Relationship Model: Basic concepts, Design Issues, Mapping Constraints, Keys, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R features.

UNIT-II

The Relational Data Model & Algebra

Relational Model: Structure of relational Databases, Relational Algebra, Relational Calculus, introduction to Views, updates on views

SQL and Integrity Constraints: Concept of DDL, DML, DCL. Basic Structure, Set operations, Aggregate Functions, Null Values, Domain Constraints, Referential Integrity Constraints, assertions, views, Nested Sub queries, Database security application development using SQL, Stored procedures and triggers.

UNIT-III

Relational Database Design:

Functional Dependency, Different anomalies in designing a Database., Normalization using functional dependencies, Decomposition, Boyce-Codd Normal Form, 3NF, Normalization using multi-valued dependencies, 4NF, 5NF

Internals of RDBMS:

Physical data structures, Query optimization: join algorithm, statistics and cost base optimization. Transaction processing, Concurrency control and Recovery Management : transaction model properties, state serializability, lock base protocols, two phase locking.

UNIT-IV

Failure Recovery and Concurrency Control.

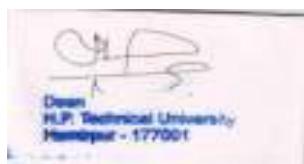
Issues and Models for Resilient Operation -Undo/Redo Logging-Protecting against Media Failures.

Concurrency Control: Serial and Serializable Schedules-Conflict Serializability –Enforcing Serializability by Locks-Locking Systems with Several Lock Modes-Concurrency Control by Timestamps, validation.

Transaction Management: Serializability and Recoverability-View, Serializability-Resolving Deadlocks-Distributed Databases: Commit and Lock

Course learning outcome (CLO):

- To provide introduction to relational model.
- To learn about ER diagrams.



- c) To understand about Query Processing and Transaction Processing.
- d) To understand about the concept of functional dependencies.

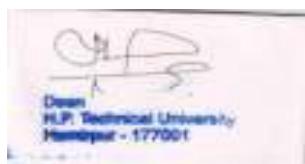
- e) To learn the concept of failure recovery.
- f) To understand the concurrency control.

Text Books

1. Ramez Elmasri , Shamkant B. Navathe , "Fundamentals of Database systems", Pearson
2. Korth, Silberschatz, Sudarshan: database concepts, MGH,

Reference Books:

1. R. Ramakrishnan and J. Gehrks database management system; MGH, International edition,
2. C. J. Date, data base systems: 7th edition, Addison Wesley, Pearson Education,
3. Chakrabarti, Advance database management systems , Wiley Dreamtech
4. Ivan Bayross, SQL and PL/SQL, BPB Publication.



CS-402 OPERATING SYSTEMS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Course objective: Role and purpose of the operating system, Functionality of a typical operating system, managing atomic access to OS objects

UNIT-I

Basic Concept of Operating System: Evolution of operating system, Fundamental of operating system functions, Multiprogramming, Multiprocessing, Time-sharing systems and real time systems. Software layers & virtual machine. Operating System Principles: Structuring methods (monolithic, layered, modular, microkernel models).

UNIT-II

Process Management: Processor scheduling, Threads, Scheduling model, CPU scheduling algorithms, CPU scheduling algorithm, Concurrent process - introduction, Concurrency specifications, Process graphs, Process creation & termination, Introduction to conflicts due to concurrency, Simple examples to illustrate the problem. Critical section problem, Semaphores, Classical Process Co-ordination problem.

UNIT-III

Memory Management: Contiguous memory allocation, Overlays, Fixed partitioning vs. Variable partitioning, Paged Memory, Segmentation, and Virtual memory.

File Management: File concepts, Access methods, Directory structure, File protection, File System structure, Allocation methods, Secondary storage management - Disk structure, Disk scheduling, Disk management, Swap-space management, Disk reliability.

UNIT-IV

Deadlock: Introduction, Analysis of conditions, Prevention & avoidance, Detection & recovery.

Protection and security: Security attacks, Security mechanisms and policies.

Virtual Machines: Types of virtualization (including Hardware/Software, OS, Server, Service, Network).

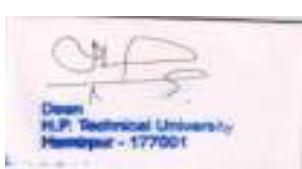
Unix/Linux/ case study / Seminar on State-of the-art technology.

Text Books

1. Silberschatz, A., Galvin, P.B. and Gagne, G., *Operating System Concepts*, John Wiley (2013), 9th ed.
2. Stallings, William, *Operating Systems Internals and Design Principles*, Prentice Hall (2014), 7th ed.

Reference Books

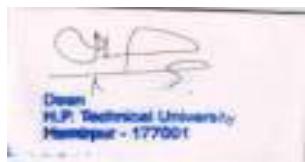
1. Dhamdhere, D.M., *Operating Systems: A Concept Based Approach*, McGraw Hill (2008) 2nd ed.
2. Flynn, I.M. and McHoes, A.M., *Understanding Operating Systems*, Thomson (2007).



Course learning outcome (CLO):

On completion of this course, the students will be able to

- a) understand basic concepts about operating system such as operating system structures, interrupts, APIs, user mode and kernel mode.
- b) understand concepts related to concurrency including, synchronization primitives, race condition, critical UNIT-Ind multi-threading.
- c) understand, apply, and analyze CPU scheduling algorithms, deadlock detection and prevention algorithms.
- d) understand and analyze various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing.
- e) understand high-level operating systems concepts such as file systems, security, protection, virtualization and device-management, disk-scheduling algorithms and various file systems.



CS-404 Theory of Computation

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Course objective: To familiarize the students with Finite State Machines and Automata theory of Computation.

UNIT-I

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers

Finite Automata: NFA with \hat{I} transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without \hat{I} transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSMs, Finite Automata with output- Moore and Melay machines

UNIT-II

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required)

Grammar Formalism: Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings

UNIT-III

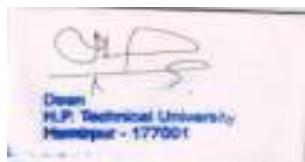
Context Free Grammars: Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA

UNIT-IV

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required)

Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

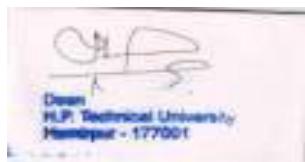


TEXT BOOKS:

1. *Introduction to Automata Theory Languages and Computation*, Hopcroft H.E. and Ullman J. D. Pearson Education
2. *Introduction to Theory of Computation* – Sipser 2nd edition Thomson

REFERENCE BOOKS

1. *Introduction to Computer Theory*, Daniel I.A. Cohen, John Wiley
2. *Introduction to languages and the Theory of Computation*, John C Martin, TMH
3. *Elements of Theory of Computation*, Lewis H.P. & Papadimitriou C.H. Pearson /PHI
4. *Theory of Computer Science, Automata languages and computation* -Mishra and Chandrashekaran, 2nd edition, PHI



EC-402 MICROPROCESSORS & PERIPHERALS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Introduction

Evolution of microprocessor, 8085 microprocessor: Features, Architecture and pin configuration; 8085 instruction: Instruction word size, Opcode format, Data format, Addressing modes; 8085 machine cycles and timing diagrams.

Typical instruction set of 8085

Data transfer instructions, Arithmetic instructions, Logic and bit manipulation instructions, Branch instructions, Machine control instruction.

UNIT – II

Programming

Development of assembly language program.

Interrupts & data transfer

Interrupt system of 8085, Stack and subroutine.

Memory interfacing

Types of memory, Memory map and address range, Memory interfacing decoding techniques: absolute and partial.

UNIT – III

I/O interfacing

Basic interfacing concept using mapping techniques: I/O mapped I/O and memory mapped I/O

Serial I/O

Basic concepts in serial I/O, Asynchronous serial data communication using SOD and SID.

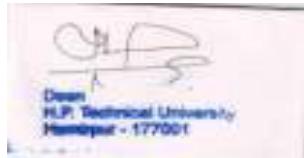
Peripheral devices & applications of microprocessor

Description of the 8251 programmable communication interface, The 8255 programmable peripheral interface, The 8257 DMA controller.

UNIT – IV

Trends in microprocessor Technology

8086/8088 microprocessor: Main features, Architecture-the execution unit and bus interface unit, Memory segmentation, Memory addressing, 8086/8088 hardware pin signals, 8086 minimum and maximum modes of operation; Introduction to 8087 floating point coprocessor and its connection to host 8086.

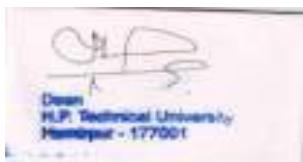


Text Books

1. *Microprocessor Architecture, programming and application with 8085*, Gaonkar, PHI.
2. *Microprocessors and Interfacing*, D.V.HALL, McGraw Hill
3. *Microprocessor and Microcontrollers*, Senthil, Saravanam ,Oxford University Press

Reference Books

- 1 *An introduction to microprocessor*, A.P. Mathur, TMH.
- 2 *The 8086 Microprocessor*, Kenneth J Ayala, Cengage Learning
3. *Fundamentals of microprocessor & microcomputers*, B.Ram, Dhanpat Rai & Co.



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - GolakNath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

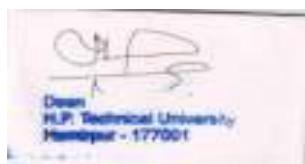
UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.

UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial review of administrative actions, exclusion of judicial review and concept of "Ombudsman"; Right to Information Act, 2005 (Sub Section 1 - 20)



Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

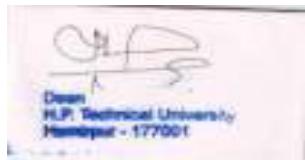
Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

4. D.D. Basu, *Shorter Constitution of India*, Prentice Hall of India, (1996)
5. MeenaRao, *Fundamental concepts in Law of Contract*, 3rd Edn. Professional Offset, (2006)
6. H.O.Agarwal, *International Law and Human Rights*, Central Law Publications, (2008)

Reference Books:

6. H.M. Seervai, *Constitutional Law of India*, Tripathi Publications, (1993).
7. S.K. Kapur, *Human Rights under International Law and Indian Law*, Central Law Agency, (2001)
8. NeelimaChandiramani, *The Law of Contract: An Outline*, 2nd Edn. Avinash Publications Mum, (2000)
9. Avtarsingh, *Law of Contract*, Eastern Book Co., (2002).
10. Anson W.R.(1979), *Law of Contract*, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verbenmituntrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

Wichtige Sprachhandlungen: Kleidung, Farben, Materialien.

Grammatik: formelle Imperativsätze mit "Sie" informelle Imperativsätze Vorschläge mit "wir" – "sollen/wollen wir" - Sollich? Modalpartikeln "doch" "mal" "doch mal".

UNIT - III

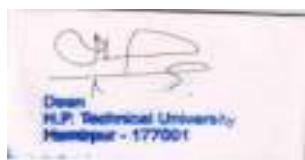
Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ "alle", "man" Indefinitepronomen "etwas", "nichts".

UNIT - IV

Wichtige Sprachhandlungen: Essen und Trinken im Restaurant, Partyvorbereitung und Feier.

Grammatik: Nomen aus Adjektiven nach "etwas" und "nichts" Nomen aus dem Infinitiv von Verben, zusammengesetzte Nomen und ihre Artikel. Adjektive im Nom. und Akk. nach unbestimmten Artikel, Negativartikel und Possessivartikel.

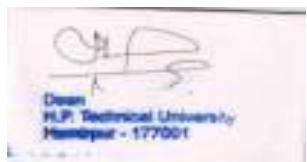


TEXT BOOK

2. Studio d A1. Deutsch als Fremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

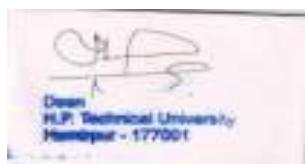
Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.

UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.

UNIT - IV

Grammar and Vocabulary – the verbs: manger, boire, the partitive articles



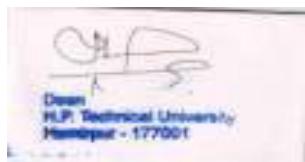
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading –reading a text.

TEXT BOOK

2. Tech French

REFERENCES

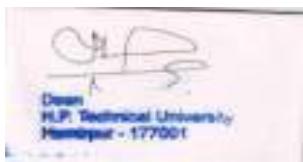
1. *French for Dummies.*
2. *French made easy: Goyal publishers.*
3. *Panorama.*



CS-411 Database Management System Lab

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

1. Introduction and concepts of SQL Basics: DDL DML DCL.
2. To create a simple database.
3. To create a table with constraints:
 - a) Primary Key
 - b) Unique
 - c) Not Null
4. Alter Table:
 - a) Adding column & multiple column
 - b) changing column width
 - c) Dropping column
 - d) adding & dropping not null
 - e) adding & dropping check constraints
 - f) adding & removing primary key
 - g) adding & removing foreign key
5. Add a record to a database:
 - a) Simple insertion
 - b) Accepting values from users
 - c) inserting values into specific column
6. Updating Tables: updating with & without where clause
7. Generating Sub Query
8. Deleting Records: Delete Single, Multiple & All records
9. Dropping tables:
 - a) Dropping table that has primary key
 - b) Dropping table that has foreign key
10. Retrieving data:
 - a) Retrieving all records
 - b) retrieving specific coloumn,
 - c) printing with user defined heading
11. Retrieving records using logical AND, OR, NOT, Between AND, IN, LIKE etc.
12. Ordering Records:
 - a) Ascending
 - b) Descending
 - c) Concatenation
 - d) Initcap
 - e) Lower
 - f) Upper
13. Group Functions:
 - a) Group by clause
 - b) having clause
 - c) all clause
14. Adding and removing permissions (Grant and Revoke)
15. To implement the concept of join Cartesian product of tables selection of rows that matches project column specified in the select clause.



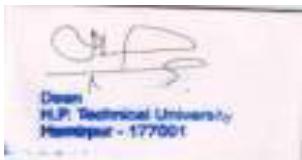
EC-405 MICROPROCESSOR & PERIPHERALS LAB

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Microprocessor & peripherals lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

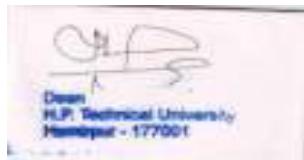
1. Addition and subtraction of two 8-bit numbers with programs based on different addressing modes of 8085A.
2. Addition and subtraction of two 16-bit numbers using 2's complement method.
3. Addition and subtraction of two 16-bit BCD numbers using DAA instruction.
4. Multiplication of two 8-bit numbers using the method of successive addition or shift & add method.
5. Division of two 8-bit numbers using the method of successive subtraction or shift & subtract method.
6. Program for block transfer and block exchange of data bytes.
7. Finding the smallest and largest element in a block of data.
8. Arranging the elements of a block of data in ascending and descending order.
9. Generating delays of different time intervals using delay subroutines.
10. To study the interfacing of 7 segment LED display with microprocessor.
11. To study the interfacing of ADC and DAC with microprocessor.
12. To study the interfacing of stepper motor with microprocessor.
13. To study and compare main features of Intel core i3, i5 and i7



E. DETAILED SYLLABI OF COURSES

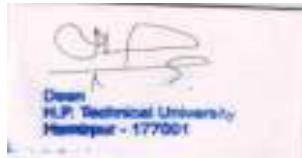
SCHEME OF TEACHING AND EXAMINATION B.TECH INFORMATION TECHNOLOGY										
SEMESTER – III										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	CS-301	Data Structures	3	1	0	4	40	60	100
4	PC	CS-302	Object Oriented Programming using C++	3	1	0	4	40	60	100
5	PC	CS-303	Computer Architecture & Organization	3	0	0	3	40	60	100
6	PC	EC-302	Digital Electronics	3	1	0	4	40	60	100
7	OE	-	Open Elective – I	2	0	0	2	40	60	100
Labs:										
1	PC	CS-311	Data Structures Lab	0	0	2	1	30	20	50
2	PC	CS-312	C++ Programming Lab	0	0	2	1	30	20	50
			Total	18	6	6	24+2			

OPEN ELECTIVE I										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	OE	HS-306	Sociology & Elements of Indian History for Engineers	2	0	0	2	40	60	100
2	OE	HS-307	German Language - I	2	0	0	2	40	60	100
3	OE	HS-308	French Language – I	2	0	0	2	40	60	100



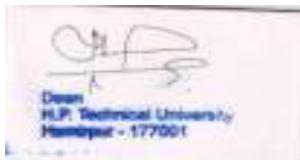
SCHEME OF TEACHING AND EXAMINATION B.TECH INFORMATION TECHNOLOGY										
SEMESTER – IV										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Human Values and Professional Ethics	2	2	0	3	40	60	100
3	PC	CS-401	Database Management System	3	0	0	3	40	60	100
4	PC	CS-402	Operating System	3	1	0	4	40	60	100
5	PC	IT-401	Web Designing	3	0	0	3	40	60	100
6	PC	EC-402	Microprocessor & its Interfacing	3	1	0	4	40	60	100
7	OE	-	Elective -II	2	0	0	2	40	60	100
Labs:										
1	PC	CS-411	Database Management System Lab	0	0	2	1	30	20	50
2	PC	EC-405	Microprocessor Lab	0	0	2	1	30	20	50
3	PC	IT-411	Web Designing Lab	0	0	2	1	30	20	50
4	MC		Field Visit Viva-Voce	0	0	2	1	30	20	50
			Total	18	6	6	24+2			

OPEN ELECTIVE II										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	OE	HS-410	Law for Engineers	2	0	0	2	40	60	100
2	OE	HS-411	German Language - II	2	0	0	2	40	60	100
3	OE	HS-412	French Language – II	2	0	0	2	40	60	100



SCHEME OF TEACHING AND EXAMINATION B.TECH INFORMATION TECHNOLOGY										
SEMESTER – V										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PC	CS-501	Computer Networks	3	1	0	4	40	60	100
2	PC	IT-501	Internet Technology	3	0	0	3	40	60	100
3	PC	CS-503	Computer Graphics	3	1	0	4	40	60	100
4	PC	CS-504	Artificial Intelligence & Expert Systems	3	0	0	3	40	60	100
5	PC	CS-505	Software Engineering	3	1	0	4	40	60	100
6	PC	CS-506	Analysis and Design of Algorithm	3	1	0	4	40	60	100
7	OE		Open Elective -III	2	0	0	2	40	60	100
Labs:										
1	PC	CS-511	Computer Networks Lab	0	0	2	1	30	20	50
2	PC	IT-511	Internet Technology Lab	0	0	2	1	30	20	50
3	MC									
			Total	20	1	6	24+2			

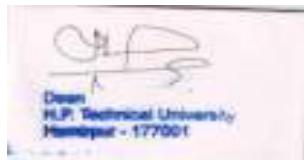
OPEN ELECTIVE – III (FOR STUDENTS OF OTHER DEPARTMENT)		
S. N.	Course Code	Subject
1		
2		
3		



SCHEME OF TEACHING AND EXAMINATION B.TECH INFORMATION TECHNOLOGY										
SEMESTER – VI										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	CS-502/ IT-601	Core Java	3	0	0	3	40	60	100
2	PC	CS-602	Enterprise Resource Planning	3	0	0	3	40	60	100
3	PC	CS-603	Compiler Design	3	1	0	4	40	60	100
4	PC	CS-604	Linux Administration	3	1	0	4	40	60	100
5	PC	CS-605	Data Mining & Data Warehousing	3	1	0	4	40	60	100
6	PC	CS-606	Multimedia Technology	3	0	0	3	40	60	100
7	PE	-	Programme Elective – I	3	0	0	3	40	60	100
Labs:										
1	PC	IT611	Core Java Lab	0	0	2	1	30	20	50
2	PC	CS-612	Multimedia Lab	0	0	2	1	30	20	50
3	MC	CS-613	Seminar	0	0	2	1	30	20	50
			Total	20	0	8	24+3			

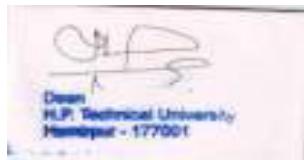
PROGRAMME ELECTIVE - I		
S. N.	Course Code	Subject
1	CS-621	PC Maintenance & Troubleshooting
2	CS-622	Distributed Operating System
3	CS-623	Management Information Systems

Industrial /Practical Training after VI Semester of six weeks duration



SCHEME OF TEACHING AND EXAMINATION B.TECH INFORMATION TECHNOLOGY										
SEMESTER – VII										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	IT-701	Current Trends & Technologies	3	0	0	3	40	60	100
2	PC	CS-702	Wireless & Mobile Communication	3	1	0	4	40	60	100
3	PC	CS-703	Information system securities.	2	2	0	3	40	60	100
4	PC	IT-702	.Net Technologies	3	1	0	4	40	60	100
5.	PE		Programme Elective-II	3	0	0	3	40	60	100
Labs:										
6	MC	IT-711	Project Work -I	0	0	4	2	30	20	50
7	PC	IT-712	Industrial /Practical Training(Viva-Voce)	0	0	4	2	30	20	50
8	PC	IT-713	.Net Lab	0	0	3	2	30	20	50
			Total	15	0	10	20+3			

PROGRAMME ELECTIVE-II		
S. N.	Course Code	Subject
1	CS-701	Advance Computer Architecture
2	CS-722	Embedded Systems
3	CS-723	Neural Networks

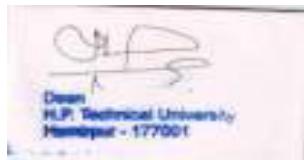


SCHEME OF TEACHING AND EXAMINATION <u>B.TECH INFORMATION TECHNOLOGY</u>										
SEMESTER – VIII										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PE		Programme Elective - III	3	0	0	3	40	60	100
2	PE		Programme Elective - IV	3	0	0	3	40	60	100
3	MC		Project Work - II	0	0	16	8	40	60	100
			Total	6	0	24	8 + 6+14			
OR										
4	MC		Industrial Project	0	0	16	8	40	60	100
			Total	0	0	24	8 + 6=14			

PROGRAMME ELECTIVE-III		
S. N.	Course Code	Subject
1	CS-811	Wireless Sensors & Adhoc Networks
2	CS-812	Distributed Computing
4	CS-813	Soft Computing

PROGRAMME ELECTIVE-IV		
S. N.	Course Code	Subject
1	IT-811	Mobile Application Development
2	IT-812	Natural Language Processing
3	IT-813	Cyber Security & Cyber Laws

Note: Industrial Project of Fourmonths duration is to be carried out by the student exclusively in industry under the joint supervision of faculty advisers from institution as well as from the industry.



MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties - Function of Random variables.

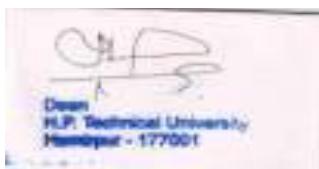
UNIT – III

Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

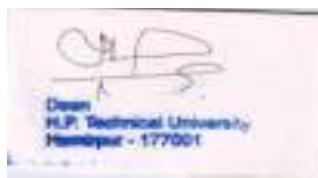


Text Books:

7. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
8. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
9. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers", 5th Edition, 2011.

Reference books:

7. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearson Education, Delhi, 2002.
8. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
9. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists" 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics - Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

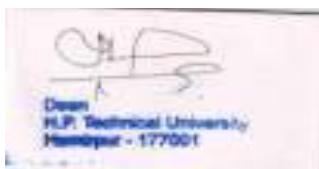
UNIT - II

Value Analysis - Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management; organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.



Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages,incentives, recruitment, training and industrial relations.

UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet, break evenanalysis - basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketingenvironment, marketing mix, advertising and sales promotion.

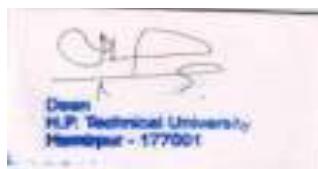
Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

Text Books:

5. PanneerSelvam, R, "Engineering Economics", Prentice Hall of India Ltd, New Delhi.
6. Dwivedi, D.N., "Managerial Economics, 7/E", Vikas Publishing House.

Reference Books:

21. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., "Engg. Economy 15/E",Prentice Hall, New York, 2011.
22. Chan S. Park, "Contemporary Engineering Economics", Prentice Hall of India, 2002.
23. F. Mazda, Engg.Management, Addison Wesley, Longman Ltd., 1998.
24. O. P. Khanna, Industrial Engg.and Management,DhanpatRai and Sons, Delhi, 2003.
25. P. Kotler, Marketing Management, Analysis, Planning, Implementation and Control,Prentice Hall, New Jersey, 2001.
26. VenkataRatnam C.S &Srivastva B.K,Personnel Management and Human Resources, Tata McGraw Hill.
27. Prasanna Chandra, Financial Management: Theory and Practice, Tata McGraw Hill.
28. Bhattacharya A.K., Principles and Practice of Cost Accounting, Wheeler Publishing.
29. Weist and Levy, A Management guide to PERT and CPM, Prantice Hall of India.
30. Koontz H.,O'Donnell C.,&Weihrich H, Essentials of Management, McGraw Hill.



CS-301 DATA STRUCTURE

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Course objective: To familiarize the students with various data structures & algorithms used in computer programming.

UNIT-I

Data Structures: Definition, Primitive and Derived Data Types, Abstract Data Types, Need for Data Structures, Types of Data Structures.

Algorithm: Definition, Characteristics, Development of Algorithm, Analysis of Complexity:- Time Complexity, Space Complexity, Order of Growth, Asymptotic Notation with example, Obtaining the Complexity of Algorithm.

Arrays: Definition, 1D and 2D arrays, Operations on Arrays, Sparse Matrices, Structures and Arrays of Structures.

UNIT-II

Linked list: Representation of Linked List in Memory, Allocation & Garbage Collection, Operations on Linked List, Doubly Linked Lists, Circular Linked List, Linked List with Header Node, Applications.

Stacks: Representation of Stack in Memory, Operations on Stack and Applications.

Queues: Representation of Queues in Memory, Operations on Queues, Circular Queues, Double Ended Queues, Priority Queues, Applications.

UNIT-III

Trees: Introduction, Representation of Tree in Memory.

Binary Trees: Terminology, Binary Tree Traversal, Binary Search Tree, Insertion, Deletion & searching in Binary Search Tree, Heap Trees, Types of Heap Trees, Insertion, Deletion in Heap Tree with example, Heap Sort Algorithm, Introduction of AVL Trees & B-Trees.

Graphs: Definition, Representation of Graph (Adjacency Matrix, Adjacency List), Traversing a Graph (DFS & BFS), Dijkstra's Algorithm for Shortest Distance, Minimum Spanning tree.

UNIT-IV

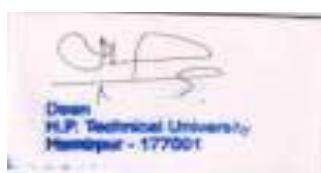
Searching and sorting: Need for Searching and Sorting, Linear and Binary search, Insertion Sort, Selection Sort, Merge Sort, Quick Sort, Radix Sort and Bubble Sort.

Hash Tables: Introduction, Hash Function, Collision Resolution Techniques in Hashing, Deletion from Hash Table.

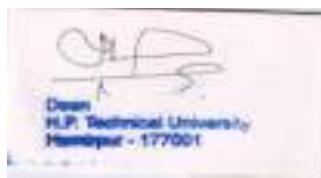
TEXT BOOKS:

1. Seymour Lipschutz : Theory and practice of Data structure , Tata Mc. Graw Hill 1998
2. Tenebaum , A. Lanhsam Y and Augensatein , A. J: Data structures using C++ , Prentice Hall of India.

REFERENCE BOOKS:



1. *Data structure and Algorithms in C++* by Micheal T. Goodrich, Wiley India publication.
2. *Data structures*, R.Venkatesan, S.Lovelyn Rose, Wiley India publication.
3. *Data Structure using C++* By Patil , Oxford University press.
4. *Data Structure , Algorithm and Object-Oriented programming* , Gregory L. Heileman, Tata Mc-Graw Hills.
5. S. Sahni , “*Data structure Algorithms ad Applications in C++*”, WCB/McGraw Hill.
6. J.P. Tremblay and P.G. Sorenson, “*An Introduction to Data Structures with applications*”, Tata McGraw Hill



CS-302 OBJECT ORIENTED PROGRAMMING USING C++

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Course Objective: This course is designed to explore computing and to show students the art of computer programming. Students will learn some of the design principles for writing good programs.

UNIT-I

Review of basic concepts of object-oriented programming, Comparison between procedural programming paradigm and object-oriented programming paradigm.

Classes and Objects: Specifying a class, Creating class objects, Accessing class members, Access specifiers – public, private, and protected, Classes, Objects and memory, Static members, The const keyword and classes, Static objects, Friends of a class, Empty classes, Nested classes, Local classes, Abstract classes, Container classes, Bit fields and classes.

Console Based I/O: Concept of streams, Hierarchy of console stream classes, Input/Output using Overloaded operators `>>` and `<<` and Member functions of I/O stream classes, Formatting Output, Formatting using `ios` class functions and flags, Formatting using manipulators.

UNIT-II

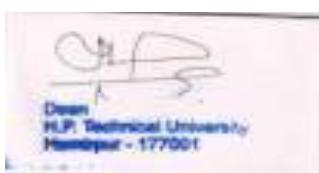
Constructors and Destructors: Need for constructors and destructors, Copy constructor, Dynamic constructors, Destructors, Constructors and destructors with static members, Initializer lists.

Operator Overloading and Type Conversion: Defining operator overloading, Rules for overloading operators, Overloading of unary operators and various binary operators, Overloading of new and delete operators, Type conversion - Basic type to class type, Class type to basic type, Class type to another class type.

Inheritance: Introduction, Defining derived classes, Forms of inheritance, Ambiguity in multiple and multipath inheritance, Virtual base class, Object slicing, Overriding member functions, Object composition and delegation, Order of execution of constructors and destructors.

UNIT-III

Pointers and Dynamic Memory Management: Understanding pointers, Accessing address of a variable, Declaring & initializing pointers, Accessing a variable through its pointer, Pointer arithmetic, Pointer to a pointer, Pointer to a function, Dynamic memory management - `new` and `delete` Operators, Pointers and classes, Pointer to an object, Pointer to a member, `this` Pointer, Self-referential classes, Possible



problems with the use of pointers - Dangling/wild pointers, Null pointer assignment, Memory leak and allocation failures.

Virtual Functions and Polymorphism: Concept of Binding - Early binding and late binding, Virtual functions, Pure virtual functions, Abstract classes, Virtual destructors &polymorphism.

UNIT-IV

Exception Handling: Review of traditional error handling, Basics of exception handling, Exception handling mechanism, Throwing mechanism, Catching mechanism, Rethrowing an exception, Specifying exceptions.

Templates and Generic Programming: Function templates, Class templates, Class templates and nontype parameters, Templates and inheritance, Templates and friends, Templates and Static members.

Managing Data Files: File streams, Hierarchy of file stream classes, Error handling during file operations, Reading/Writing of files, Accessing records randomly, Updating files, Data formatting in memory buffers.

Text Books:

1. Lippman, S.B. and Lajoie, J., *C++Primer*, Pearson Education (2005) 4th ed..
2. Stroustrup, Bjarne, *The C++ Programming Language*, Pearson Education (2000) 3rd ed.
3. Kanetkar Y., *Let Us C++*, BPB Publications, 2nded.
4. Balaguruswamy E., *Object Oriented Programming with C++*, McGraw Hill, 2013.

Reference Books:

1. Eills, Margaret A. and Stroustrup ,Bjarne, *The Annotated C++ Reference Manual*, Pearson Education (2002).
2. Rumbaugh, J.R., Premerlani, W. and Blaha, M., *Object Oriented Modeling and Design with UML*, Pearson Education (2005) 2nd ed.
3. Kanetkar, Yashvant, *Let us C++*, Jones and Bartlett Publications (2008) 8th ed.
4. Brian W. Kernighan, Dennis M. Ritchie, *The C++ Programming Language*, Prentice Hall)
5. Schildt H., *C++: The Complete Reference*, Tata Mcgraw Hill, 2003.

Course Learning Outcomes (CLO):

On completion of this course, the students will be able to

- a) write, compile and debug programs in C++ language.
- b) use different data types, operators and console I/O function in a computer program.
- c) design programs involving decision control statements, loop control statements and case control structures.
- d) understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of poiners.
- e) comprehend the concepts of structures and classes: declaration, initialization and implementation.
- f) apply basics of object oriented programming, polymorphism and inheritance.
- g) use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.



CS-303 COMPUTER ARCHITECTURE AND ORGANIZATION

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Course objective: Focus is on the architecture and organization of the basic computer modules viz controls unit, central processing unit, input-output organization and memory unit. Cover basics of computer arithmetic and parallel processing concepts.

UNIT-I

Basics of Digital Electronics: Codes, Logic gates, Flip flops, Registers, Counters, Multiplexer, Demultiplexer, Decoder, Encoder.

Register Transfer and Micro operations: Register transfer Language, Register transfer, Bus & memory transfer, Logic micro operations, Shift micro operation.

Computer Arithmetic: Unsigned, Signed and Floating point data representation, Addition, subtraction, Multiplication and Division algorithms. Booths multiplication algorithm.

UNIT-II

Basic Computer Organization: Instruction codes, Computer instructions, Timing & control, Instruction Cycles,

Memory reference instruction, Input/Output& Interrupts, Complete computer description & design of basic computer.

Control Unit: Hardwired vs. Micro programmed control unit.

Central Processing Unit: General register organization, Stack organization, Instruction format, Addressing Modes, Data transfer & manipulation, Program control, RISC, CISC.

UNIT-III

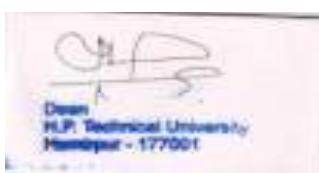
Input-Output Organization: Peripheral devices, I/O interface, Modes of data transfer: Programmed I/O, Interrupt-Initiated I/O, DMA transfer, I/O processor. Serial Communication.

Memory Unit: Memory hierarchy, Processor vs. memory speed, Main Memory, Auxiliary Memories, High-speed memories, Cache memory, Associative memory, Virtual memory, and Memory management hardware.

UNIT-IV

Introduction to Parallel Processing: Flynn's Classification, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Characteristics of multiprocessors, Interconnection structures, Interprocessor arbitration, Interprocessor communication & synchronization.

Performance evaluation SPEC marks LINPACK Whetstone Dhrystone etc., Transaction processing benchmarks.



Case Studies: Case studies of some contemporary advanced architecture for processors of families like Intel, AMD, IBM etc./Seminar on State-of the-art technology.

Text Books:

1. *Mano, Morris M., Computer System Architecture, Prentice Hall*
2. *Hayes, J.P., Computer Architecture and Organization, McGraw Hill*

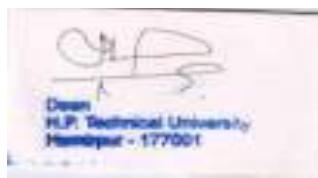
Reference Books:

1. *Hennessy, J.L., Patterson, D.A, and Goldberg, D., Computer Architecture A Quantitative Approach, Pearson Education Asia*
2. *Leigh, W.E. and Ali, D.L., System Architecture: software and hardware concepts, South Wester Publishing Co.*

Course learning outcome (CLO):

On completion of this course, the students will be able to

- a) understand basics of digital electronics such as Flip flops, Registers, Counters, Multiplexer, Demultiplexer, Decoder, Encoder etc.
- b) understand basic concepts of computer architecture including, syntax of register transfer language, micro operations, instruction cycle, and control unit.
- c) design and analyze the instruction format & addressing modes for a given operation and algorithms for addition, subtraction, multiplication & division.
- d) understand and analyze various memory management techniques like associate memory, cache memory, virtual memory etc. and understand interfacing of computer with input and output devices.
- e) understand the concept of pipelining, multiprocessors, and inter processor communication and hence evaluation of different contemporary advanced architectures.



EC-302 DIGITAL ELECTRONICS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Number system & codes

Binary arithmetic (Addition, Subtraction, Multiplication and Division), Floating point numbers. Diminished radix and radix compliments, BCD codes, 8421 code, Excess-3 code, Gray code, Error detection and correction: Parity code, Hamming code.

Logic gates

Positive & negative logic, Tristate logic gates, Schmitt gates, Totem pole output and open collector output; Fan in and Fan out of logic gates, Buffer & trans-receivers, IEEE/ANSI standards symbols.

UNIT-II

Boolean algebra simplification techniques

Sum of products and product of sums simplification, NAND and NOR implementation, Incompletely specified functions, Ex-OR functions, The map method: Two, Three, Four and Five variable maps; The tabulation method, Determination of prime implicants, Selection of essential prime implicants.

Logic families

Classification of digital IC's, Significance & types, Characteristics parameters, TTL, ECL, CMOS logic families, NMOS & PMOS logic, Interfacing between TTL & CMOS.

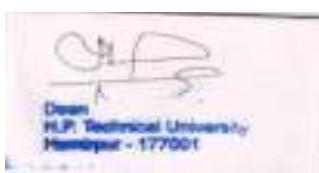
UNIT-III

Combinational logic circuits

Implementing combinational logic, Arithmetic circuits: Half adder, Full adder, Half subtractor, Full subtractor; Multiplexer, Encoder, Demultiplexer & Decoder.

Flip flops

Introduction, S-R flip-flops, Level & edge triggered flip flops, JK flip-flop, D flip-flop, T flip-flop, Master slave JK flip-flop, Flip flop timing parameters & applications.



UNIT-IV

Shift Registers

Shift register, Ring counter, Universal shift registers, SISO, PISO, SIPO & PIPO.

Counters

Asynchronous ripple counter, Synchronous counter, Modulus of a counter, Binary ripple counter, Up& down, Decade counter.

Semiconductor Memories

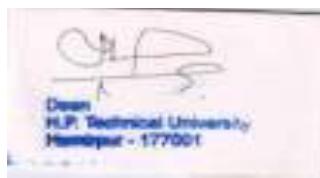
Classification of memories, ROM, RAM, Static memory and Dynamic memory. Programmable logic arrays, Charged-coupled device memory

Text Books

4. Digital Electronics -Principle & Integrated circuits, Anil K Maini, Wiley India edition
5. Modern Digital Electronics, R.P.Jain, TMH
6. M. Morris Mano, Digital Design, Prentice Hall of India.

Reference Books

3. Digital Principle and Applications, Malvino and Leach, TMH
4. Digital Electronics, Kharate, Oxford University Press



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT- I

Introduction to sociological concepts - structure, system, organization, social institution, Culture social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT –II

Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

UNIT –III

Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.

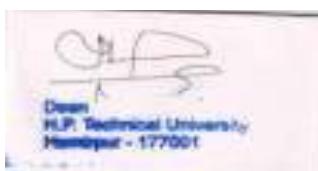
UNIT - IV

From feudalism to colonialism -the coming of British; Modernity and struggle for independence.

Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India 2nd phase (LPG decade post 1991)

Text Books:

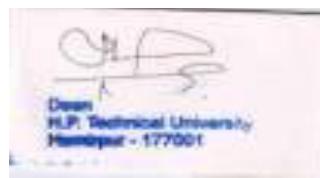
7. Desai, A.R. (2005), Social Background of Indian Nationalism, Popular Prakashan.



8. Giddens, A (2009), Sociology, Polity, 6thEdition.
9. Chandoke, Neera& Praveen Priyadarshi(2009), contemporary India: Economy, Society and Politics, Pearson.

Reference Books:

9. Guha, Ramachandra(2007), India After Gandhi, Pan Macmillan.
10. Haralambos M, RM Heald, M Holborn (2000), Sociology, Collins.
11. Sharma R. S..(1965), Indian feudalism, Macmillan.
12. Gadgil, Madhab&RamchandraGuha(1999) - This Fissured Land: An Ecological Histry of India, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offer opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßige Verben im Präsens - “sein” und haben im Präsens - Personalpronomen im Nominativ.

UNIT- II

WichtigeSprachhandlungen: TelefonNummernverstehen und sprechenUhrzeitenverstehen und sagenVerneinung “nicht und kein” (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notierenbestimmter und unbestimmter Artikel und Negativartikel im Nom. & Akkusativ

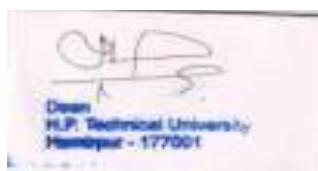
UNIT- III

WichtigeSprachhandlungen: Tageszeitenverstehen und überTermine sprechen- Verabredungen verstehen - Aufgaben im Haushalt verstehen

Grammatik: Personalpronomen im Akkusativ und Dativ - W-Fragen “wie, wer, wohin, wo, was usw.-Genitiv bei Personennamen - Modalverben im Präsens “können, müssen, möchten”

UNIT- IV

WichtigeSprachhandlungen: Sich austauschen, was man kann, muss – Bezeichnungen Lebensmittel – Mengenangaben verstehen – Preise verstehen und Einkaufszettelschreiben



Grammatik: Wortstellung in Sätzen mit Modalverben – Konnektor ”und” – “noch”-kein-----mehr – “wieviel, wieviele, wie alt, wie lange” – Possessivartikel im Nominativ.

UNIT V

Wichtige Sprachhandlungen: Freizeitanzeigen verstehen

Hobby und Sportarten Anzeigen für Freizeitpartner schreiben bzw. darauf antworten – Vorlieben und Abneigungen ausdrucken

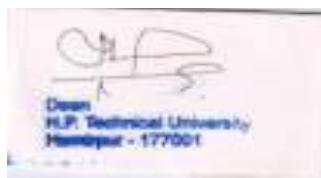
Grammatik: Verben mit Vokalwechsel im Präsens – Modalverben im Präsens “dürfen, wollen und mögen” - “haben und sein” im Präteritum – regelmäßige Verben im Perfekt – Konnektoren “denn, oder, aber.”

TEXT BOOK

1. Studio d A1. Deutsch als Fremdsprache with CD. (Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offer opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verb of self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the French alphabet and the accents that play a vital role in the pronunciation of the words.

Writing: Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subject pronouns.

Listening and Speaking: Pronunciation of words like Isabelle, presentez and la liaison – vous êtes, vous appelez and role play of introducing each other – group activity.

Writing: Particulars in filling an enrolment / registration form.

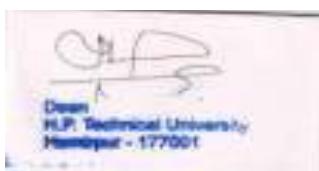
Reading Comprehension: reading a text of a famous scientist and answering questions.

UNIT – III

Grammar and Vocabulary: Verb of possession “avoir” and 1st group verbs “er”, possessive adjectives and pronouns of insistence- moi, lui..and numbers from 0 to 20.

Listening and Speaking: Nasal sounds of the words like feminine, ceinture, parfum and how to ask simple questions on one’s name, age, nationality, address, mail id and telephone number.

Writing: Conjugations of first group verbs and paragraph writing on self – introduction and introducing a third person.



Reading Comprehension: reading a text that speaks of one's profile and answering questions

UNIT - IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb "aimer" and seasons of the year and leisure activities.

Listening and Speaking: To express one's likes and dislikes and to talk of one's pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing: Conjugations of the irregular verbs: faire and savoir and their usage. Paragraph writing on one's leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one's way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs, a droite, la première à gauche and vocabulary relating to accommodation.

Listening and Speaking: To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing: Paragraph writing describing the accommodation using the different prepositions like en face de, derrière- to locate.

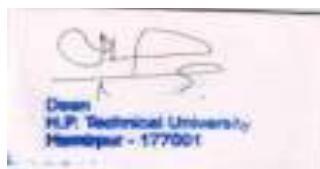
Reading Comprehension: A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliothèque?.....

TEXT BOOK

1. Tech French

REFERENCES

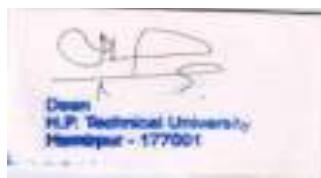
1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



CS-311 DATA STRUCTURE LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

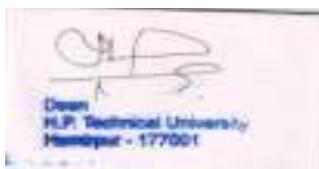
1. Write recursive programme which computes the nth Fibonacci number
2. Write recursive programme which computes the factorial of a given number.
3. Write a program to implement linear search using arrays
4. Write a program to implement binary search using arrays
5. Write c program to implement bubblesort, to sort a given list of integers in ascending order.
6. Program to implement insertion sort to sort a given list of integers in ascending order.
7. program to implement INSERTION SORT to sort a list of numbers
8. Write a C program that implement mergesort, to sort a given list of integers in ascending order.
9. Write C programs that implement stack using arrays
10. Write C programs that implement stack using linked list Program
11. Write c programs that implement Queue using array
12. Write C programs that implement Queue using linked lists.
13. Write program to implement linked list operations(Creation, Insertion, Deletion, reversing).
14. Write a program to implement binary tree
15. Write a program to implement heap sort using arrays



CS-312C++ Programming Lab

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

1. Write a program in C++ to exchange the content of two variables using call by reference
2. Write a program in C++ to search the 2nd largest & smallest element in an array.
3. Write a C++ program to implement a student class having roll no., name, rank, addresses as data members.
4. Write a program in C++ demonstrating the Static Data member.
5. Write a program in C++ demonstrating the public, protected and private parameters.
6. Write a program in C++ to demonstrate constructor with default argument.
7. Write a program in C++ to demonstrate the Constructor Overloading, assume desired parameters.
8. Write a program in C++ to create the class shape, and overload the function to return the perimeters of the different shapes.
9. Write a program in C++ to demonstrate destructor in inheritance.
10. Write a program in C++ to demonstrate multiple inheritance.
11. Write a program in C++ to demonstrate multilevel inheritance.
12. Write a program in C++ to demonstrate public,private and protected inheritance.
13. Write a program in C++ to demonstrate virtual function.
14. Write a program in C++ to demonstrate friend function.
15. To demonstrate function overriding.
16. Write a program in C++ to copy & append the content of file into another. (Assume suitable data)
17. Write a C++ program implement a class 'Complex' of complex numbers. The class should be include member functions to add and subtract two complex numbers. .
18. Write a C + + program to implement matrix class. Add member function to transpose the matrix.
19. Write a C ++ program to implement a class for complex numbers with add and multiply as member functions. Overload ++ operator to increment a complex number.



EC-306 DIGITAL ELECTRONICS LAB

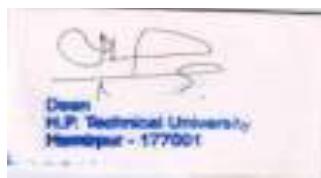
Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Digital Electronics lab.’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

14. To verify the truth table of logic gates realize AND, OR, NOT gates
15. To realize AND, OR gates using diodes and resistors
16. Implementation of X-OR and X-NOR using NAND and NOR gates.
17. Design of a digital circuit using K-map and realise by using NAND-NAND or NOR-NOR gates.
18. Design of an adder logic circuit.
19. Design of a subtractor logic circuit.
20. Implementation of logic equations using MUX, DEMUX
21. Design of an encoder logic circuit.
22. Design of a decoder logic circuit.
23. Conversion from one flip flop to another.
24. Design of a counter and its realization using FFs.
25. Design of a shift register and its realization using FFs.
26. Design BCD to seven-segment display using 7447 IC

NOTE: The above experiments may also be performed on simulation software



MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

UNIT – II

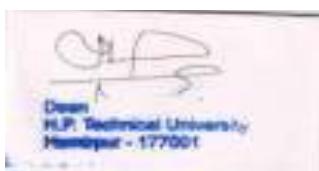
Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.

UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.

Approximation methods for nonlinear programming: Line search methods, gradient methods, conjugate gradient methods; Networking techniques – PERT and CPM.



UNIT - IV

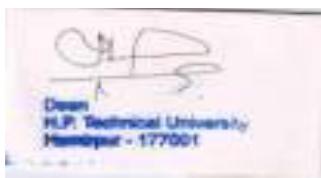
Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and its role in minimization, minimization under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

9. C. B. Gupta, "Optimization Techniques in Operation Research," I. K. International Publishing House Pvt. Ltd.
10. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
11. Mukesh Kumar Singh, "Calculus Of Variations" Krishna Prakashan Media (P) Ltd.
12. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

11. I. M. Gelf and S. V. Fomin, "Calculus of Variations" Dover Publications IncMineola, New York.
12. Purna Chand Biswal, "Optimization in Engineering, Scitech Publications India Pvt. Ltd.
13. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
14. G. Hadly, Linear Programming, Narosa Publishing House.
15. KantiSwarup, P. K. Gupta and Manmohan, "Operations Research," Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

3. Understanding the need , basic guidelines, content and process of value Education
4. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

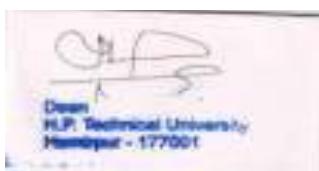
5. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
6. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
7. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
8. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

4. Understanding human being as a co-existence of the self and the body.
5. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
6. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

3. Understanding the characteristics and activities of ‘I’ and harmony in ’I’
4. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.



UNIT V: Harmony in Family, Society and Nature

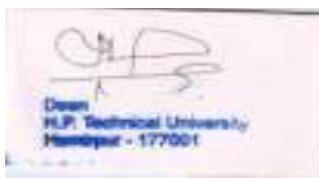
4. Understanding harmony in the family, society and nature.
5. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.
6. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

3. R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).
4. R R Gaur, R Sangal and G P Bagaria, Teacher's Manual (English), 2009.

Reference Books

7. E.F. Schumacher, Small is Beautiful; a study of economics as if people mattered, Blond & Briggs, Bratian, 1973.
8. PL Dhar, RR Gaur, Science and Humanism, common wealth publishers, 1990.
9. A.N. Tripathy, Human values, New Age International Publishers, 2003.
10. E.G. Seebauer& Robert, L BERRY, Foundational of Ethics for Scientists &Engineers, Oxford University Press, 2000.
11. M. Govindrajran, S.Natraljan& V.S. Senthil Kumar, Engineering Ethics (including human Values), Eastern Economy Edition, Prentice hall of India Ltd.
12. B.L. Bajpai, 2004, Indian Ethos and Modern Management, New Royal book Co; Lucknow, 2004, Reprinted 2008.



CS-401 DATABASE MANAGEMENT SYSTEMS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Course objective: To familiarize the students with Data Base Management system.

UNIT-I

Introduction: Concept & Overview of DBMS, Data Models, Database Languages, Database Administrator, Database Users, Three Schema architecture of DBMS.

Entity-Relationship Model: Basic concepts, Design Issues, Mapping Constraints, Keys, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R features.

UNIT-II

The Relational Data Model & Algebra

Relational Model: Structure of relational Databases, Relational Algebra, Relational Calculus, introduction to Views, updates on views

SQL and Integrity Constraints: Concept of DDL, DML, DCL. Basic Structure, Set operations, Aggregate Functions, Null Values, Domain Constraints, Referential Integrity Constraints, assertions, views, Nested Sub queries, Database security application development using SQL, Stored procedures and triggers.

UNIT-III

Relational Database Design:

Functional Dependency, Different anomalies in designing a Database., Normalization using functional dependencies, Decomposition, Boyce-Codd Normal Form, 3NF, Normalization using multi-valued dependencies, 4NF, 5NF

Internals of RDBMS:

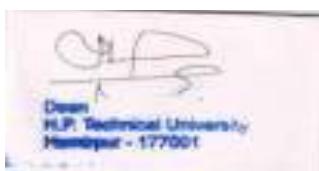
Physical data structures, Query optimization: join algorithm, statistics and cost base optimization. Transaction processing, Concurrency control and Recovery Management : transaction model properties, state serializability, lock base protocols, two phase locking.

UNIT-IV

Failure Recovery and Concurrency Control.

Issues and Models for Resilient Operation -Undo/Redo Logging-Protecting against Media Failures.

Concurrency Control: Serial and Serializable Schedules-Conflict Serializability –Enforcing Serializability by Locks-Locking Systems with Several Lock Modes-Concurrency Control by Timestamps, validation.



Transaction Management: Serializability and Recoverability-View, Serializability-Resolving Deadlocks-Distributed Databases: Commit and Lock

Course learning outcome (CLO):

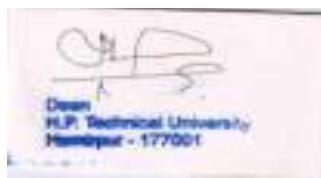
- g) To provide introduction to relational model.
- h) To learn about ER diagrams.
- i) To understand about Query Processing and Transaction Processing.
- j) To understand about the concept of functional dependencies.
- k) To learn the concept of failure recovery.
- l) To understand the concurrency control.

Text Books

- 3. Ramez Elmasri , Shamkant B. Navathe , "Fundamentals of Database systems", Pearson
- 4. Korth, Silberschatz, Sudarshan: database concepts, MGH,

Reference Books:

- 5. R. Ramakrishnan and J. Gehrks database management system; MGH, International edition,
- 6. C. J. Date, data base systems: 7th edition, Addison Wesley, Pearson Education,
- 7. Chakrabarti, Advance database management systems , Wiley Dreamtech
- 8. Ivan Bayross, SQL and PL/SQL, BPB Publication.



CS-402 OPERATING SYSTEMS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Course objective: Role and purpose of the operating system, Functionality of a typical operating system, managing atomic access to OS objects

UNIT-I

Basic Concept of Operating System: Evolution of operating system, Fundamental of operating system functions, Multiprogramming, Multiprocessing, Time-sharing systems and real time systems. Software layers & virtual machine. Operating System Principles: Structuring methods (monolithic, layered, modular, microkernel models).

UNIT-II

Process Management: Processor scheduling, Threads, Scheduling model, CPU scheduling algorithms, CPU scheduling algorithm, Concurrent process - introduction, Concurrency specifications, Process graphs, Process creation & termination, Introduction to conflicts due to concurrency, Simple examples to illustrate the problem. Critical section problem, Semaphores, Classical Process Co-ordination problem.

UNIT-III

Memory Management: Contiguous memory allocation, Overlays, Fixed partitioning vs. Variable partitioning, Paged Memory, Segmentation, and Virtual memory.

File Management: File concepts, Access methods, Directory structure, File protection, File System structure, Allocation methods, Secondary storage management - Disk structure, Disk scheduling, Disk management, Swap-space management, Disk reliability.

UNIT-IV

Deadlock: Introduction, Analysis of conditions, Prevention & avoidance, Detection & recovery.

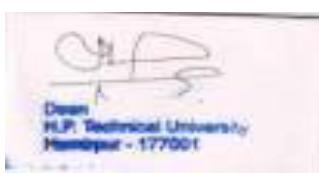
Protection and security: Security attacks, Security mechanisms and policies.

Virtual Machines: Types of virtualization (including Hardware/Software, OS, Server, Service, Network).

Unix/Linux/ case study / Seminar on State-of the-art technology.

Text Books

3. Silberschatz, A., Galvin, P.B. and Gagne, G., *Operating System Concepts*, John Wiley (2013), 9th ed.



4. *Stallings, William, Operating Systems Internals and Design Principles, Prentice Hall (2014), 7th ed.*

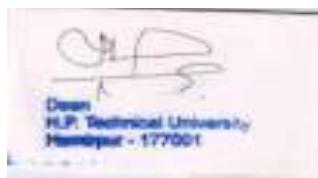
Reference Books

3. *Dhamdhere, D.M., Operating Systems: A Concept Based Approach, McGraw Hill (2008) 2nd ed.*
4. *Flynn, I.M. and McHoes, A.M., Understanding Operating Systems, Thomson (2007).*

Course learning outcome (CLO):

On completion of this course, the students will be able to

- f) understand basic concepts about operating system such as operating system structures, interrupts, APIs, user mode and kernel mode.
- g) understand concepts related to concurrency including, synchronization primitives, race condition, critical UNIT-Ind multi-threading.
- h) understand, apply, and analyze CPU scheduling algorithms, deadlock detection and prevention algorithms.
- i) understand and analyze various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing.
- j) understand high-level operating systems concepts such as file systems, security, protection, virtualization and device-management, disk-scheduling algorithms and various file systems.



IT-403 Web Designing

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Course Objectives - The student will be able to define the principle of Web page design, define the basics in web design, Visualize the basic concept of HTML, and recognize the elements of HTML, Introduce basics concept of CSS, develop the concept of web publishing

UNIT-I

Web Design Principles: Basic principles involved in developing a web site, Planning process, Five Golden rules of web designing, Designing navigation bar, Page design, Home Page Layout, Design Concept.

Basics in Web Design: Brief History of Internet, What is World Wide Web, Why create a web site, Web Standards, Audience requirement

UNIT-II

Introduction to HTML: What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags

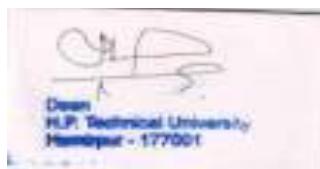
Elements of HTML: Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls.

UNIT-III

Introduction to Cascading Style Sheets: Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model (Introduction, Border properties, Padding Properties, Margin properties), CSS Advanced (Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector), CSS Color, Creating page Layout and Site Designs.

UNIT-IV

Introduction to Web Publishing or Hosting: Creating the Web Site, Saving the site, working on the web site, Creating web site structure, Creating Titles for web pages, Themes-Publishing web sites.



EC-402 MICROPROCESSORS & PERIPHERALS

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Introduction

Evolution of microprocessor, 8085 microprocessor: Features, Architecture and pin configuration; 8085 instruction: Instruction word size, Opcode format, Data format, Addressing modes; 8085 machine cycles and timing diagrams.

Typical instruction set of 8085

Data transfer instructions, Arithmetic instructions, Logic and bit manipulation instructions, Branch instructions, Machine control instruction.

UNIT – II

Programming

Development of assembly language program.

Interrupts & data transfer

Interrupt system of 8085, Stack and subroutine.

Memory interfacing

Types of memory, Memory map and address range, Memory interfacing decoding techniques: absolute and partial.

UNIT – III

I/O interfacing

Basic interfacing concept using mapping techniques: I/O mapped I/O and memory mapped I/O

Serial I/O

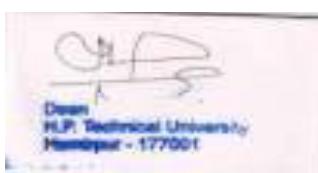
Basic concepts in serial I/O, Asynchronous serial data communication using SOD and SID.

Peripheral devices & applications of microprocessor

Description of the 8251 programmable communication interface, The 8255 programmable peripheral interface, The 8257 DMA controller.

UNIT – IV

Trends in microprocessor Technology



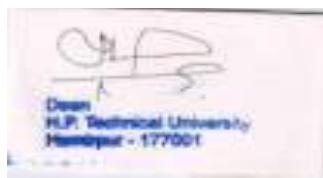
8086/8088 microprocessor: Main features, Architecture-the execution unit and bus interface unit, Memory segmentation, Memory addressing, 8086/8088 hardware pin signals, 8086 minimum and maximum modes of operation; Introduction to 8087 floating point coprocessor and its connection to host 8086.

Text Books

1. Microprocessor Architecture, programming and application with 8085, Gaonkar, PHI.
2. Microprocessors and Interfacing , D.V.HALL, McGraw Hill
3. Microprocessor and Microcontrollers, Senthil, Saravanam ,Oxford University Press

Reference Books

- 1 An introduction to microprocessor, A.P. Mathur, TMH.
- 2 The 8086 Microprocessor, Kenneth J Ayala, Cengage Learning
3. Fundamentals of microprocessor & microcomputers, B.Ram, Dhanpat Rai& Co.



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - GolakNath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

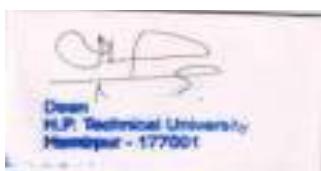
UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.

UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial review of administrative actions, exclusion of judicial review and concept of "Ombudsman"; Right to Information Act, 2005 (Sub Section 1 - 20)



Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

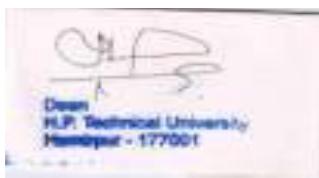
Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

7. D.D. Basu, Shorter Constitution of India, Prentice Hall of India, (1996)
8. MeenaRao, Fundamental concepts in Law of Contract, 3rd Edn. Professional Offset, (2006)
9. H.O.Agarwal,International Law and Human Rights, Central Law Publications, (2008)

Reference Books:

11. H.M. Seervai,Constitutional Law of India, Tripathi Publications, (1993).
12. S.K. Kapur, Human Rights under International Law and Indian Law, Central Law Agency, (2001)
13. NeelimaChandiramani, The Law of Contract: An Outline, 2nd Edn. Avinash Publications Mum, (2000)
14. Avtarsingh, Law of Contract, Eastern Book Co., (2002).
15. Anson W.R.(1979), Law of Contract, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verben mit untrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

Wichtige Sprachhandlungen: Kleidung, Farben, Materialien.

Grammatik: formelle Imperativsätze mit "Sie" informelle Imperativsätze Vorschläge mit "wir" – "sollen/wollen wir" - Sollich? Modalpartikeln "doch" "mal" "doch mal".

UNIT - III

Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ "alle", "man" Indefinitepronomen "etwas", "nichts".

UNIT - IV

Wichtige Sprachhandlungen: Essen und Trinken im Restaurant, Partyvorbereitung und Feier.



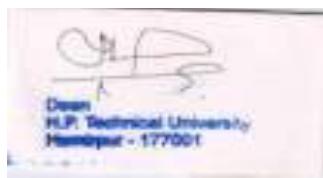
Grammatik: Nomen aus Adjektiven nach "etwas" und "nichts" Nomen aus dem Infinitiv von Verben, zusammengesetzte Nomen und ihre Artikel. Adjektive im Nom. und Akk. nach unbestimmten Artikel, Negativartikel und Possessivartikel.

TEXT BOOK

3. Studio d A1. Deutsch als Fremdsprache with CD. (Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

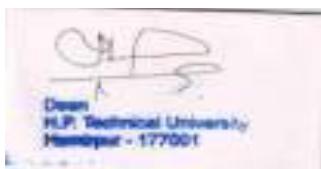
Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.



UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.

UNIT - IV

Grammar and Vocabulary –the verbs: manger, boire, the partitive articles

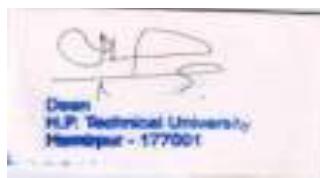
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading –reading a text.

TEXT BOOK

3. Tech French

REFERENCES

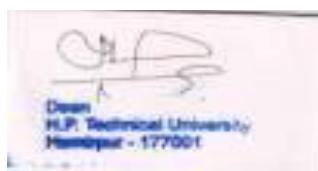
1. French for Dummies.
2. French made easy: Goyal publishers.
3. Panorama.



CS-411 Database Management System Lab

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

1. Introduction and concepts of SQL Basics: DDL DML DCL.
2. To create a simple database.
3. To create a table with constraints:
 - d) Primary Key
 - e) Unique
 - f) Not Null
4. Alter Table:
 - h) Adding column & multiple column
 - i) changing column width
 - j) Dropping column
 - k) adding & dropping not null
 - l) adding & dropping check constraints
 - m) adding & removing primary key
 - n) adding & removing foreign key
5. Add a record to a database:
 - d) Simple insertion
 - e) Accepting values from users
 - f) inserting values into specific column
6. Updating Tables: updating with & without where clause
7. Generating Sub Query
8. Deleting Records: Delete Single, Multiple & All records
9. Dropping tables:
 - c) Dropping table that has primary key
 - d) Dropping table that has foreign key
10. Retrieving data:
 - d) Retrieving all records
 - e) retrieving specific column,
 - f) printing with user defined heading
11. Retrieving records using logical AND, OR, NOT, Between AND, IN, LIKE etc.
12. Ordering Records:
 - g) Ascending
 - h) Descending
 - i) Concatenation
 - j) Initcap
 - k) Lower
 - l) Upper
13. Group Functions:
 - d) Group by clause
 - e) having clause
 - f) all clause
14. Adding and removing permissions (Grant and Revoke)
15. To implement the concept of join Cartesian product of tables selection of rows that matches project column specified in the select clause.



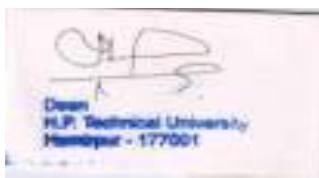
EC-405 MICROPROCESSOR & PERIPHERALS LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Microprocessor & peripherals lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

14. Addition and subtraction of two 8-bit numbers with programs based on different addressing modes of 8085A.
15. Addition and subtraction of two 16-bit numbers using 2's complement method.
16. Addition and subtraction of two 16-bit BCD numbers using DAA instruction.
17. Multiplication of two 8-bit numbers using the method of successive addition or shift & add method.
18. Division of two 8-bit numbers using the method of successive subtraction or shift & subtract method.
19. Program for block transfer and block exchange of data bytes.
20. Finding the smallest and largest element in a block of data.
21. Arranging the elements of a block of data in ascending and descending order.
22. Generating delays of different time intervals using delay subroutines.
23. To study the interfacing of 7 segment LED display with microprocessor.
24. To study the interfacing of ADC and DAC with microprocessor.
25. To study the interfacing of stepper motor with microprocessor.
26. To study and compare main features of Intel core i3, i5 and i7



IT-411 Web Designing Lab

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

1. Introduction to the Internet
2. Creating a Basic Web Page
3. Attributes, Lists and Tables
4. Links and Images
5. Cascading Style Sheets Introduction
6. CSS - Selector Type, Values, Common Properties
7. CSS - Common Properties (Cont'd), Directory Structure, Some Common Tags
8. Web Page Layout Techniques
9. Introduction to Dreamweaver
10. More Features of Dreamweaver
11. CSS Improvement - Typography, Imagery
12. CSS Tips & Tricks
13. JavaScript Introduction
14. Variable, If-Else, Switch
15. Operators, Popups, Functions, Loops
16. Forms, Events, and Event Handling
17. Try-Catch, Some Guidelines of JavaScript Programming
18. Introduction to JavaScript Object
19. JS Built-in Objects



F. DETAILED SYLLABI OF COURSES

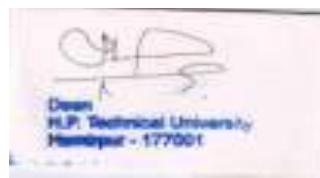
SCHEME OF TEACHING AND EXAMINATION B.TECH-ELECTRONICS AND COMMUNICATION ENGINEERING										
SEMESTER – III										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	EC-301	Analog Electronics	3	1	0	3	40	60	100
4	PC	EC-302	Digital Electronics	3	1	0	4	40	60	100
5	PC	EC-303	Network Analysis & Synthesis	3	1	0	3	40	60	100
6	PC	EC-304	Signals & Systems	3	1	0	4	40	60	100
7	OE	-	Open Elective-I	2	0	0	2	40	60	100
Labs:										
1	PC	EC-305	Analog Electronics Lab	0	0	2	1	30	20	50
2	PC	EC-306	Digital Electronics Lab	0	0	2	1	30	20	50
3	MC	EC-307	MATLAB & its application in signals & systems	0	0	3	2	30	20	50
			Total	17	6	7	24+2			

OPEN ELECTIVE I										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	HS	HS -306	Sociology & Elements of Indian History for Engineers	2	0	0	2	40	60	100
2	HS	HS -307	German Language - I	2	0	0	2	40	60	100
3	HS	HS-308	French Language – I	2	0	0	2	40	60	100



SCHEME OF TEACHING AND EXAMINATION B.TECH-ELECTRONICS AND COMMUNICATION ENGINEERING										
SEMESTER – IV										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Humans Values & Professional ethics	2	2	0	3	40	60	100
3	PC	EC-401	Analog Communication	3	1	0	4	40	60	100
4	PC	EC-402	Microprocessors & Peripherals	3	1	0	4	40	60	100
5	PC	EC-403	Linear Integrated Circuits	3	1	0	3	40	60	100
6	PC	EC-404	Pulse Shaping & Wave Generation	3	1	0	3	40	60	100
7	OE	-	Open Elective-II	2	0	0	2	40	60	100
Labs:										
1	PC	EC-405	Microprocessors& Peripherals Lab	0	0	2	1	30	20	50
2	PC	EC-406	Pulse Shaping, Wave Generation and LIC Lab	0	0	2	1	30	20	50
3	MC	EC-407	Electronic workshop& Analog Communication Lab	0	0	3	2	30	20	50
			Total	16	8	7	24+2			

OPEN ELECTIVE II										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	HS	HS -410	Law for Engineers	2	0	0	2	40	60	100
2	HS	HS -411	German Language - II	2	0	0	2	40	60	100
3	HS	HS-412	French Language – II	2	0	0	2	40	60	100



SCHEME OF TEACHING AND EXAMINATION B.TECH-ELECTRONICS AND COMMUNICATION ENGINEERING										
SEMESTER – V										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PC	EC-501	Digital Communication	3	1	0	4	40	60	100
2	PC	EC-502	Electromagnetic Field Theory	3	1	0	4	40	60	100
3	PC	EC-503	Electronic logic circuit design	3	1	0	3	40	60	100
4	PC	EC-504	Electronic Measurements & Measuring Instruments	3	1	0	3	40	60	100
5	PC	EC-505	Power Electronics	3	1	0	3	40	60	100
6	PC	EC-506	Introduction to Microcontrollers for Embedded Systems	3	1	0	3	40	60	100
Labs:										
1	PC	EC-507	Power Electronics &EMMI Lab	0	0	2	1	30	20	50
2	PC	EC-508	Introduction to Microcontrollers for Embedded systems lab	0	0	2	1	30	20	50
3	MC	EC-509	MATLAB and its application in communication systems	0	0	3	2	30	20	50
			Total	18	6	7	24			

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	OE	EC-510	Biomedical Engineering	2	0	0	2	40	60	100
2	OE	EC-511	Microprocessor & Peripherals	2	0	0	2	40	60	100
3	OE	EC-512	Optical Communication	2	0	0	2	40	60	100



**SCHEME OF TEACHING AND EXAMINATION
B.TECH E&C ENGINEERING**

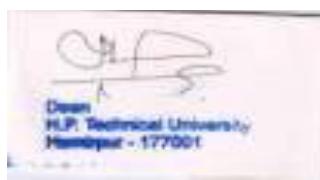
SEMESTER – VI

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	EC-601	Advanced Microcontrollers for Embedded systems	3	1	0	3	40	60	100
2	PC	EC-602	Antenna & Wave Propagation	3	1	0	3	40	60	100
3	PC	EC-603	Control Systems	3	1	0	4	40	60	100
3	PC	EC-604	Digital Signal Processing	3	1	0	4	40	60	100
5	PC	EC-605	Microelectronics Technology	3	1	0	3	40	60	100
6.	PC	EC-606	Wireless & Mobile Communication	3	1	0	3	40	60	100
7	PE	-	Programme Elective – I	3	0	0	3	40	60	100
Labs:										
1	PC	EC-607	Advanced Microcontrollers for Embedded systems Lab	0	0	2	1	30	20	50
2	PC	EC-608	Digital Signal Processing Lab	0	0	2	1	30	20	50
3	MC	EC-609	Seminar	0	0	2	1	30	20	50
			Total	21	6	6	23+3			

PROGRAM ELECTIVE I

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	PE	EC-610	TV Engineering	3	0	0	3	40	60	100
2	PE	EC-611	Peripheral System Design & Interleaving	3	0	0	3	40	60	100
3	PE	EC-612	Reliability Engineering	3	0	0	3	40	60	100

Industrial /Practical Training after VIth Semester of six weeks duration



SCHEME OF TEACHING AND EXAMINATION B.TECH-ELECTRONICS AND COMMUNICATION ENGINEERING										
SEMESTER – VII										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	EC-701	Computer Networks & Data Communication	3	0	0	3	40	60	100
2	PC	EC-702	Microwave & Radar Engineering	3	1	0	4	40	60	100
3	PC	EC-703	Optical Communication	3	1	0	3	40	60	100
4	PC	EC-704	VLSI Design	3	1	0	4	40	60	100
5	PE	-	Programme Elective – II	3	0	0	3	40	60	100
Labs:										
6	MC	EC-705	Project Work –I	0	0	4	2	30	20	50
7	PC	EC-706	Industrial /Practical Training(Viva-Voce)	0	0	4	2	30	20	50
8	MC	EC-707	Microwave & Optical Communication Lab	0	0	3	2	30	20	50
			Total	12	3	11	20			

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	PE	EC-708	Computer Architecture and Organization	3	0	0	3	40	60	100
2	PE	EC-709	Modeling & Simulation of Communication	3	0	0	3	40	60	100
3	PE	EC-710	Principles of Soft Computing	3	0	0	3	40	60	100



SCHEME OF TEACHING AND EXAMINATION
B.TECH-ELECTRONICS AND COMMUNICATION ENGINEERING

SEMESTER – VIII

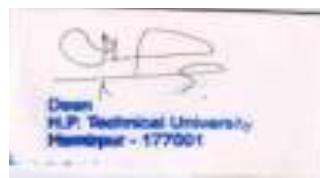
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PE	-	Program Elective – III	3	0	0	3	40	60	100
2	PE	-	Program Elective – IV	3	0	0	3	40	60	100
3	MC	EC-807	Project Work – II	0	0	16	8	40	60	100
			Total	6	0	16	8+6			
OR										
4	MC	EC-808	Industrial Project	0	0	16	8	40	60	100
			Total	0	0	16	8			

PROGRAM ELECTIVE III

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	PE	PE-801	Biomedical Engineering	3	0	0	3	40	60	100
2	PE	PE-802	Information Theory & Coding	3	0	0	3	40	60	100
3	PE	PE-803	Digital System Design using HDL	3	0	0	3	40	60	100

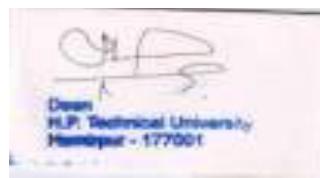
PROGRAM ELECTIVE IV

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	PE	PE-804	Digital Image Processing	3	0	0	3	40	60	100
2	PE	PE-805	Electronic Switching Systems	3	0	0	3	40	60	100
3	PE	PE-806	Satellite Communication	3	0	0	3	40	60	100



Note: Industrial Project of Four months duration is to be carried out by the student exclusively in industry under the joint supervision of faculty advisers from institution as well as from the industry.

SUMMARY OF CREDITS									
Category	Sub-Category	Semester							
		I & II	III	IV	V	VI	VII	VIII	
FC	Basic Sciences & Math (BSM)	18	3	3	0	0	0	0	24
	Humanities & Social Sciences (HS)	6	3	3	0	0	0	0	12
	Engineering Science (ES)	24	0	0	0	0	0	0	24
PC	Program Core (PC)	0	16	16	22	22	16	0	92
PE	Program Electives (PE)	0	0	0	0	3	3	6	12
OE	Open Electives (OE)	0	2	2	2	0	0	0	6
P	Project Work (P)	0	0	0	0	0	2	8	10
MC	Mandatory Courses (MC)	0	2	2	2	1	2	0	9
	Total	48	26	26	26	26	23	14	189



SEMESTER-III



MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties - Function of Random variables.

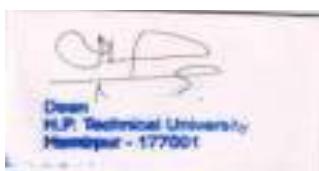
UNIT – III

Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

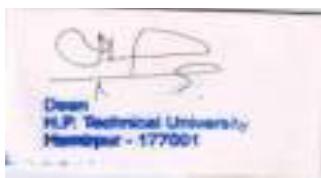


Text Books:

10. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
11. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
12. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers", 5th Edition, 2011.

Reference books:

10. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearson Education, Delhi, 2002.
11. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
12. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists" 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics - Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

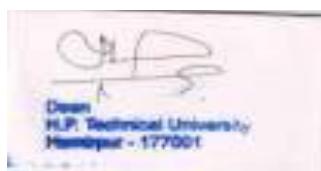
UNIT - II

Value Analysis - Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management; organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.



Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages,incentives, recruitment, training and industrial relations.

UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet, break evenanalysis - basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketingenvironment, marketing mix, advertising and sales promotion.

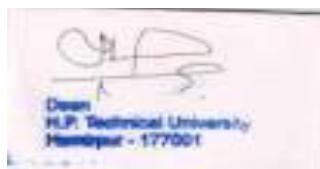
Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

Text Books:

7. PanneerSelvam, R, "Engineering Economics", Prentice Hall of India Ltd, New Delhi.
8. Dwivedi, D.N., "Managerial Economics, 7/E", Vikas Publishing House.

Reference Books:

31. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., "Engg. Economy 15/E",Prentice Hall, New York, 2011.
32. Chan S. Park, "Contemporary Engineering Economics", Prentice Hall of India, 2002.
33. F. Mazda, Engg.Management, Addison Wesley, Longman Ltd., 1998.
34. O. P. Khanna, Industrial Engg.and Management,DhanpatRai and Sons, Delhi, 2003.
35. P. Kotler, Marketing Management, Analysis, Planning, Implementation and Control,Prentice Hall, New Jersey, 2001.
36. VenkataRatnam C.S & Srivastva B.K,Personnel Management and Human Resources, Tata McGraw Hill.
37. Prasanna Chandra, Financial Management: Theory and Practice, Tata McGraw Hill.
38. Bhattacharya A.K., Principles and Practice of Cost Accounting, Wheeler Publishing.
39. Weist and Levy, A Management guide to PERT and CPM, Prantice Hall of India.
40. Koontz H.,O'Donnell C.,&Weihrich H, Essentials of Management, McGraw Hill.



EC-301 ANALOG ELECTRONICS

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Semiconductor diodes

Diode specifications, Diode resistance, Diode junction capacitance, Diode equivalent circuits, Load line analysis of diode circuit, Diode types: Zener, Backward, Varactor, Step recovery, Schottky, Tunnel.

Low frequencyBJT analysis

Simplified & complete h-parameter analysis for CB, CE and CC & configuration, Calculation of CB, CE & CC parameters using h-parameters.

UNIT-II

Multistage amplifier

General cascaded system, RC coupled amplifier and its frequency response, Merits and demerits, Transformer coupled amplifier,Cascode amplifiers, Darlington pair amplifiers, Effect of frequency on multistage amplifier stages.

High frequency analysis of BJT

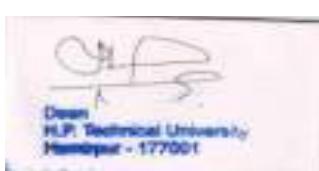
High frequency model for CE amplifiers, Approximate CE high frequency model with resistive load, CE short circuit gain.HF current gain with resistive load.

UNIT-III

Large signal amplifiers

Analysis and design of Class A, B, AB amplifiers; Class A, B, AB Push Pull amplifiers, Merits & demerits, Distortion calculations.

Tuned amplifiers



General behaviour of tuned amplifiers, Advantages and disadvantages of tuned amplifiers. Single tuned amplifiers, Frequency response of single tuned amplifiers, Staggered tuned amplifier.

UNIT-IV

Feedback amplifiers

Introduction, Characteristics of negative feedback, Feedback topologies: Voltage series, Voltage shunt, Current series and Current shunt.

Optoelectronic devices

Photo sensors, Photo conductor, Photodiodes, Photo transistor, LED, LCD, OLEDs,

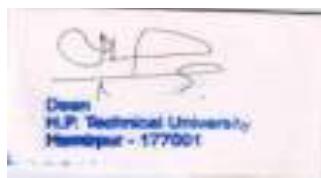
Plasma display, Field emission displays, Electronic ink displays, Opto-couplers.

Text Books

1. Electronic Devices & Circuits, A.K.Maini, Wiley.
2. Basic Electronics and Linear Circuits, N.N. Bhargava, S.C.Gupta, D.C.Krlshreshtha, TMH
3. Electronic Devices & Circuit Theory, Boylestad, Pearson

Reference Books

1. Electronic Devices & Circuits, I.J.Nagrath, PHI.
2. Electronic Devices & Circuits, Salivahnna, TMH.
3. Fundamental of Electronics, Thomas, Morgan & Claypool Publishers.



EC-302 DIGITAL ELECTRONICS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Number system & codes

Binary arithmetic (Addition, Subtraction, Multiplication and Division), Floating point numbers. Diminished radix and radix compliments, BCD codes, 8421 code, Excess-3 code, Gray code, Error detection and correction: Parity code, Hamming code.

Logic gates

Positive & negative logic, Tristate logic gates, Schmitt gates, Totem pole output and open collector output; Fan in and Fan out of logic gates, Buffer & trans-receivers, IEEE/ANSI standards symbols.

UNIT-II

Boolean algebra simplification techniques

Sum of products and product of sums simplification, NAND and NOR implementation, Incompletely specified functions, Ex-OR functions, The map method: Two, Three, Four and Five variable maps; The tabulation method, Determination of prime implicants, Selection of essential prime implicants.

Logic families

Classification of digital IC's, Significance & types, Characteristics parameters, TTL, ECL, CMOS logic families, NMOS & PMOS logic, Interfacing between TTL & CMOS.

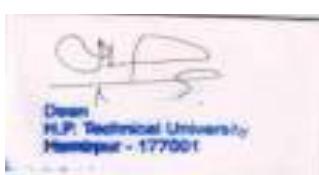
UNIT-III

Combinational logic circuits

Implementing combinational logic, Arithmetic circuits: Half adder, Full adder, Half subtractor, Full subtractor; Multiplexer, Encoder, Demultiplexer & Decoder.

Flip flops

Introduction, S-R flip-flops, Level & edge triggered flip flops, JK flip-flop, D flip-flop, T flip-flop, Master slave JK flip-flop, Flip flop timing parameters & applications.



UNIT-IV

Shift Registers

Shift register, Ring counter, Universal shift registers, SISO, PISO, SIPO & PIPO.

Counters

Asynchronous ripple counter, Synchronous counter, Modulus of a counter, Binary ripple counter, Up& down, Decade counter.

Semiconductor Memories

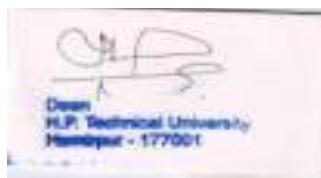
Classification of memories, ROM, RAM, Static memory and Dynamic memory. Programmable logic arrays, Charged-coupled device memory

Text Books

7. Digital Electronics -Principle & Integrated circuits, Anil K Maini, Wiley India edition
8. Modern Digital Electronics, R.P.Jain, TMH
9. M. Morris Mano, Digital Design, Prentice Hall of India.

Reference Books

5. Digital Principle and Applications, Malvino and Leach, TMH
6. Digital Electronics, Kharate, Oxford University Press



EC-303 NETWORK ANALYSIS & SYNTHESIS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Analysis of coupled circuits and application of network theorem in AC circuits

Active element conventions: Modelling of coupled circuits, Dot convention in coupled circuits; Network theorems in AC circuits: Thevenin's and Norton's theorems, Superposition theorem, Reciprocity and maximum power transfer theorem.

Graph theory and network equations

Introduction and graph of a network, The incidence matrix, Fundamental cut set matrix, Fundamental tie set matrix and loop currents, Relation between various matrices. Network equilibrium equations: using KVL and KCL; Networks with mutual inductance, Duality.

UNIT-II

Application of Laplace transform in circuit analysis

Review of Laplace transform: Definition of Laplace transform and its inverse, Laplace transform of basic functions, Properties of Laplace transform; Application of Laplace transforms in circuit analysis: Transformation of time domain circuit components to s-domain, Laplace transform to solution of network problems.

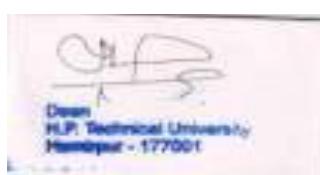
Transient response

Transient response of R-L, R-C, R-L-C circuits (series combinations only) for DC and sinusoidal excitations.

UNIT-III

Two port networks

Concept of two port networks, Classification of parameters: Open circuit and Short circuit parameters, Transmission and inverse transmission parameters, Hybrid and inverse hybrid parameters; Condition for



reciprocity and symmetry, Inter-relationship between the parameters. Interconnection of two port networks: Series, Parallel,Cascade and series-parallel connection.T and pi representations.

UNIT-IV

Fundamentals of network synthesis

Network functions, Concept of poles and zeros,Necessary condition of a stability of a network function.

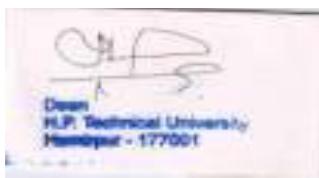
Hurwitz polynomial and its properties, Positive real function, Properties of positive real functions, Testing a positive real function, Synthesis of R-L, R-C and L-C driving point functions: Foster and Cauer forms.

Text Books

1. Fundamentals of Electric circuits, Charles K Alexander, Matthew N O Sadiku, TMH
2. Circuit Theory -Analysis and synthesis, A. Charkrabarti,DhanpatRai& co.
3. Network analysis and synthesis, Franklin F. Kuc, PHI.

Reference Books

1. Networks and Systems, D.RoyChoudhury, New Age International.
2. Network Analysis, Van Valkenberg, PHI
3. Engineering Circuit Analysis, William Hayt and Jack Kemmerly, TMH
4. Circuits and Networks- Analysis and Synthesis,A.Sudhakar and S.P.Shyam Mohan, TMH



EC-304 SIGNALS & SYSTEMS

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction

Signals and functions, classification of signals, Operations on Signals, Classification of Systems. Interconnection of systems, systems with and without memory, causality, stability, linearity and time invariance. Time-domain representation and analysis of LTI and LSI systems using input-output relationships and unit impulse response.

UNIT-II

LTI systems

Response of LTI systems: Convolution sum, convolution integral and their evaluation; Causality and stability considerations.

Continuous time Fourier series

Introduction, Fourier series representation for continuous time periodic signals, convergence of Fourier series, properties of continuous time Fourier series, Frequency Spectrum of Continuous periodic Signals, Parseval's Theorem.

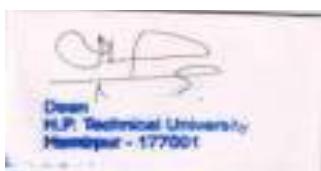
UNIT-III

Continuous time Fourier transform

Introduction, convergence of Fourier transform, Fourier transform evaluation of various continuous signals, properties of continuous time Fourier transform.

Laplace transform

Region of convergence, properties of Region of convergence, Analysis of continuous time systems, Transfer function, properties of Laplace transforms, Inverse Laplace transforms.



UNIT-IV

Z-Transform

Region of convergence, Properties of Region of convergence, Analysis of LSISystems, Transfer function, properties of Z-transforms, Inverse Z-transforms.

Signal sampling

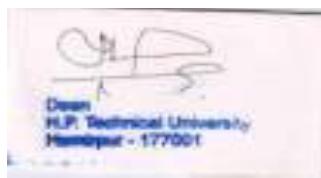
Introduction, Need for sampling, Sampling theorem, Impulse-train sampling, Data reconstruction of signal from its samples, Critical sampling, Over sampling and under sampling – Aliasing.

Text Books

1. Signals and Systems, Oppenheim, Willsky& Hamid Nawab, Pearson Education.
2. Signals & Systems,V.Krishnaveni and A. Rajeswari, Wiley India.

Reference Books

1. Signals and Systems,ANagoor, TMH.
2. Continuous Signals and Systems with MATLAB,TaanElAli, Mohammad A. Karim, CRC Press.
3. Fourier and Laplace Transforms, R. J. Beerends, Cambridge University Press.
4. Fundamentals of Signals & Systems, Roberts, TMH
5. Getting Started with MATLAB, RudraPratap, Oxford University Press.



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT- I

Introduction to sociological concepts - structure, system, organization, social institution, Culture social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT –II

Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

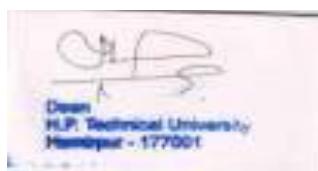
UNIT –III

Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.

UNIT - IV

From feudalism to colonialism -the coming of British; Modernity and struggle for independence.



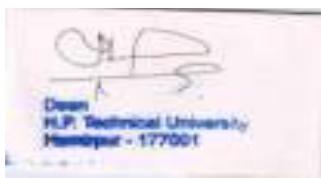
**Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India
2ndphase (LPG decade post 1991)**

Text Books:

10. Desai, A.R. (2005), *Social Background of Indian Nationalism*, Popular Prakashan.
11. Giddens, A (2009), *Sociology*, Polity, 6thEdition.
12. Chandoke, Neera& Praveen Priyadarshi(2009), *contemporary India: Economy, Society and Politics*, Pearson.

Reference Books:

13. Guha, Ramachandra(2007), *India After Gandhi*, Pan Macmillan.
14. Haralambos M, RM Heald, M Holborn (2000), *Sociology*, Collins.
15. Sharma R. S..(1965), *Indian feudalism*, Macmillan.
16. Gadgil, Madhab&RamchandraGuha(1999) - *This Fissured Land: An Ecological History of India*, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßige Verben im Präsens - “sein” und haben im Präsens - Personalpronomen im Nominativ.

UNIT- II

WichtigeSprachhandlungen: TelefonNummernverstehen und sprechen Uhrzeitenverstehen und sagen Verneinung “nicht und kein” (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notieren bestimmt und unbestimmter Artikel und Negativartikel im Nom. & Akkusativ

UNIT- III

WichtigeSprachhandlungen: Tageszeitenverstehen und überTermine sprechen- Verabredungen verstehen - Aufgaben im Haushalt verstehen

Grammatik: Personalpronomen im Akkusativ und Dativ - W-Fragen “wie, wer, wohin, wo, was usw.-Genitiv bei Personennamen - Modalverben im Präsens “können, müssen, möchten”



UNIT- IV

WichtigeSprachhandlungen:Sichaustauschen, was man kann, muss –BezeichnungenLebensmittel – Mengenangabenverstehen – PreiseverstehenundEinkaufzettelschreiben

Grammatik:Wortstellung in SätzenmitModalverben – Konnektor ”und” – “noch”-kein-----mehr – “wieviel, wieviele, wie alt, wie lange” –PossessivartikelimNominativ.

UNIT V

WichtigeSprachhandlungen:Freizeitanzeigenverstehen
HobbysundSportartenAnzeigenfürFreizeitpartnerschreibenbzw. daraufantworten –Vorlieben und Abneigungenausdrucken

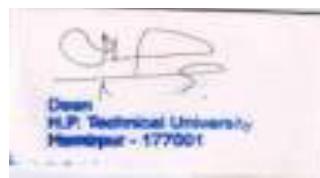
Grammatik:VerbenmitVokalwechselimPräsens – ModalverbenimPräsens“dürfen, wollen und mögen - “haben und sein” imPräteritum – regelmäßigeVerbenimPerfekt – Konnektoren “denn, oder, aber.

TEXT BOOK

1. Studio d A1. Deutsch alsFremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offer opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verb of self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the French alphabet and the accents that play a vital role in the pronunciation of the words.

Writing: Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subject pronouns.

Listening and Speaking: Pronunciation of words like Isabelle, presentez and la liaison – vous êtes, vousappelez and role play of introducing each other – group activity.

Writing: Particulars in filling an enrolment / registration form.

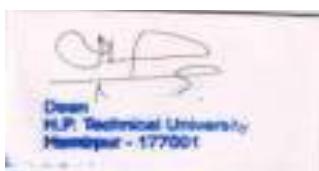
Reading Comprehension: reading a text of a famous scientist and answering questions.

UNIT – III

Grammar and Vocabulary: Verb of possession “avoir” and 1st group verbs “er”, possessive adjectives and pronouns of insistence- moi, lui..and numbers from 0 to 20.

Listening and Speaking: Nasal sounds of the words like feminine, ceinture, parfum and how to ask simple questions on one’s name, age, nationality, address, mail id and telephone number.

Writing: Conjugations of first group verbs and paragraph writing on self – introduction and introducing a third person.



Reading Comprehension: reading a text that speaks of one's profile and answering questions

UNIT – IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb "aimer" and seasons of the year and leisure activities.

Listening and Speaking: To express one's likes and dislikes and to talk of one's pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing: Conjugations of the irregular verbs: faire and savoir and their usage. Paragraph writing on one's leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one's way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs, a droite, la première à gauche and vocabulary relating to accommodation.

Listening and Speaking: To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing: Paragraph writing describing the accommodation using the different prepositions like en face de, derrière- to locate.

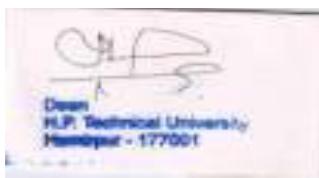
Reading Comprehension: A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliothèque?.....

TEXT BOOK

1. Tech French

REFERENCES

1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



EC-305ANALOG ELECTRONICS LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

1. To study the characteristics of different types of Diodes.
2. Find out h-parameters of BJT
3. Design and implement CE-BJT amplifier and verify various parameters
4. To study the two stage RC coupled transistor amplifier.
5. To study Class-B push pull amplifier at audio frequency.
6. To find the Efficiency of Class-A or Class AB Amplifier.
7. To plot frequency response of Single Tuned Amplifier.
8. To study the frequency response of BJT amplifier with and without feedback.
9. To study effects of Voltage Series Feedback.
10. To study effects of Voltage Shunt Feedback
11. To study modelling of circuits with optoelectronic devices using simulation software.
12. To study current voltage characteristics of LED.

NOTE :The above experiments may also be performed on simulation software



EC-306 DIGITAL ELECTRONICS LAB

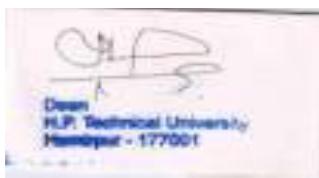
Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Digital Electronics lab.’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

27. To verify the truth table of logic gates realize AND, OR, NOT gates
28. To realize AND, OR gates using diodes and resistors
29. Implementation of X-OR and X-NOR using NAND and NOR gates.
30. Design of a digital circuit using K-map and realise by using NAND-NAND or NOR-NOR gates.
31. Design of an adder logic circuit.
32. Design of a subtractor logic circuit.
33. Implementation of logic equations using MUX, DEMUX
34. Design of an encoder logic circuit.
35. Design of a decoder logic circuit.
36. Conversion from one flip flop to another.
37. Design of a counter and its realization using FFs.
38. Design of a shift register and its realization using FFs.
39. Design BCD to seven-segment display using 7447 IC

NOTE: The above experiments may also be performed on simulation software



EC-307 MAT LAB & ITS APPLICATIONS IN SIGNALS AND SYSTEMS

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		I.A.	ESE	Total	
0	0	3	2	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Signals & Systems lab.’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

1. To implement various operations on matrices like rank, transpose, sparse, null matrix, zero padding etc.
2. To read & write various file formats like xls, png, jpeg etc.
3. To plot one dimensional and two dimensional graphs using various MATLAB 2-D plots types.
4. The teacher concerned will give at least 4 exercises like roots of a quadratic equation, guessing a number, unit conversion, factorial program etc. to demonstrate MATLAB environment.
5. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).
6. To study operations on signals.
7. To study convolution of continuous signals.
8. To study frequency spectrum of various signals.
9. To analyse different pulses to obtain relationship between time domain and frequency domain.
10. To study signal sampling & aliasing.
11. To study laplace transform and z-transform.
12. To study convolution of discrete signals.

NOTE: All the practicals must to be performed on MATLAB.



SEMESTER-IV



MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

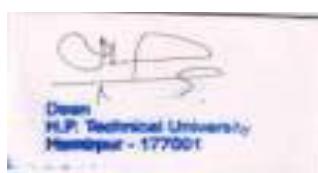
UNIT – II

Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.

UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.



Approximation methods for nonlinear programming: Line search methods, gradientmethods, conjugate gradient methods; Networkingtechniques – PERT and CPM.

UNIT - IV

Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and it's role in minimization, minimization under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

13. C. B. Gupta, "Optimization Techniques in Operation Research," I. K. International Publishing House Pvt. Ltd.
14. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
15. Mukesh Kumar Singh, "Calculus Of Variations" Krishna Prakashan Media (P) Ltd.
16. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

16. I. M.Gelf and S. V. Fomin, "Calculus of Variations" Dover Publications IncMineola, New York.
17. Purna Chand Biswal, "Optimization in Engineering, Scitech Publications India Pvt. Ltd.
18. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
19. G. Hadly, Linear Programming, Narosa Publishing House.
20. KantiSwarup, P. K. Gupta and Manmohan, "Operations Research," Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

3. Understanding the need , basic guidelines, content and process of value Education
4. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

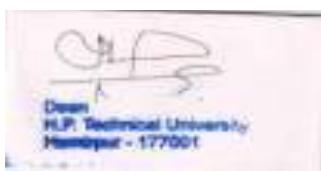
5. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
6. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
7. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
8. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

4. Understanding human being as a co-existence of the self and the body.
5. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
6. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

3. Understanding the characteristics and activities of ‘I’ and harmony in ’I’
4. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.



UNIT V: Harmony in Family, Society and Nature

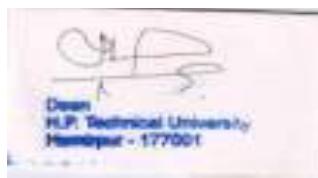
4. Understanding harmony in the family, society and nature.
5. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.
6. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

3. *R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).*
4. *R R Gaur, R Sangal and G P Bagaria, Teacher's Manual (English), 2009.*

Reference Books

7. *E.F. Schumacher, Small is Beautiful; a study of economics as if people mattered, Blond & Briggs, Bratain, 1973.*
8. *PL Dhar, RR Gaur, Science and Humanism, common wealth publishers, 1990.*
9. *A.N. Tripathy, Human values, New Age International Publishers, 2003.*
10. *E.G. Seebauer& Robert, L BERRY, Foundational of Ethics for Scientists &Engineers, Oxford University Press, 2000.*
11. *M. Govindrajran, S.Natrajan& V.S. Senthil Kumar, Engineering Ethics (including human Values), Eastern Economy Edition, Prentice hall of India Ltd.*
12. *B.L. Bajpai, 2004, Indian Ethos and Modern Management, New Royal book Co; Lucknow, 2004, Reprinted 2008.*



EC-401 ANALOG COMMUNICATION

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction

Information, Transmitter, Channel, Noise, Receiver.Modulation: Description, Need of modulation;Types of channels: Characteristics & modelling, Need for wireless communication, Electromagnetic spectrum range & applications.

Spectral density and correlation

Correlation, Cross correlation & auto-correlation, Energy spectral density, Correlation of energy signals, Power spectral density, Correlation of power signals, Properties of energy & power spectral density.

UNIT – II

Noise

External noise: Atmospheric, Extra-terrestrial, Industrial; Internal noise: Thermal, Shot, Flicker noise, Transit time, Partition noise; Voltage and current models of a noisy resistor, Noise figure: SNR, Definition of noise figure; Equivalent noise bandwidth, Noise temperature, White noise, Narrowband noise.

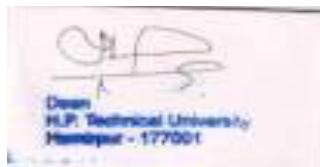
Probability theory and random processes

Probability theory, Random variables, Gaussian distribution, Random process, Stationary, Mean, Correlation, and covariance functions, Ergodic process, Gaussian process, Properties of cross-correlation & autocorrelation functions.

UNIT – III

AM theory

AM representation, DSB-FC, DSB-SC, SSB, VSB, Power & current calculations.



AM transmission

Introduction, Generation of amplitude modulation, Low level and high level modulation, Basic principle of AM generation, Generation of DSB-FC: Square law diode modulation, Switching modulation; Generation of DSB-SC: Balanced modulator, Ring modulator; Generation of SSB: Filter method, Phase shift method, Third method; VSB modulation and demodulation/ General theory of sideband filtering.

AM detector

DSB-FC detector: Square law detector, Envelope or diode detector; DSB-SC detector: Synchronous detector, Costa's receiver; SSB detector: Synchronous/ Coherent detector.

AM reception

Characteristics parameter of a receiver: Selectivity, Sensitivity and fidelity; Super heterodyne receiver: Basic elements of AM super-heterodyne receiver, Image frequency and its rejection, Tuning and tracking of SHD, Automatic gain control.

UNIT – IV

Angle modulation

Angle modulation – Representation of frequency modulation and phase modulation signal, Narrowband FM and sinusoidal FM(wideband FM), Frequency spectrum for sinusoidal FM, Average power and transmission bandwidth of FM, Non-sinusoidal modulation: Deviation ratio, Phase modulation; Equivalence between PM and FM, Sinusoidal phase modulation.

Angle generation of FM:

Direct method (Parameter variation method), Indirect method (Armstrong's method)

Angle modulation detectors

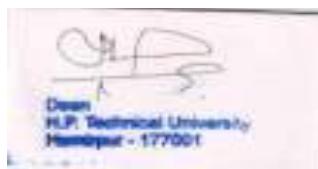
Slope detector, Balanced slope detector, Foster-Seeley discriminator, Ratio detector, Quadrature detector, PLL demodulator, Amplitude limiters, Pre-emphasis and de-emphasis, FM radio broadcasting and FM stereo broadcasting.

Text Books

1. Communication Systems, Singh & Sapre, TMH
2. Communication Systems, Kennedy, TMH
3. Communication Systems, Dennis Roddy, Pearson.

Reference Books

1. Electronic Communication Systems, Wayne Tomasi, Pearson.
2. Principles of Communication System, Taub and Schilling, McGraw Hill
3. Communication Systems, Simon Haykin, Wiley



EC-402MICROPROCESSORS & PERIPHERALS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Introduction

Evolution of microprocessor, 8085 microprocessor: Features, Architecture and pin configuration; 8085 instruction: Instruction word size, Opcode format, Data format, Addressing modes; 8085 machine cycles and timing diagrams.

Typical instruction set of 8085

Data transfer instructions, Arithmetic instructions, Logic and bit manipulation instructions, Branch instructions, Machine control instruction.

UNIT – II

Programming

Development of assembly language program.

Interrupts & data transfer

Interrupt system of 8085, Stack and subroutine.

Memory interfacing

Types of memory, Memory map and address range, Memory interfacing decoding techniques: absolute and partial.

UNIT – III

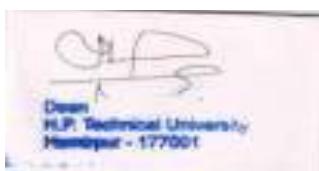
I/O interfacing

Basic interfacing concept using mapping techniques: I/O mapped I/O and memory mapped I/O

Serial I/O

Basic concepts in serial I/O, Asynchronous serial data communication using SOD and SID.

Peripheral devices & applications of microprocessor



Description of the 8251 programmable communication interface, The 8255 programmable peripheral interface, The 8257 DMA controller.

UNIT – IV

Trends in microprocessor technology

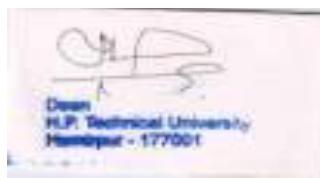
8086/8088 microprocessor: Main features, Architecture-the execution unit and bus interface unit, Memory segmentation, Memory addressing, 8086/8088 hardware pin signals, 8086 minimum and maximum modes of operation; Introduction to 8087 floating point coprocessor and its connection to host 8086.

Text Books

1. Microprocessor Architecture, programming and application with 8085, Gaonkar, PHI.
2. Microprocessors and Interfacing , D.V.HALL, McGraw Hill
3. Microprocessor and Microcontrollers, Senthil, Saravanam ,Oxford University Press

Reference Books

- 1 An introduction to microprocessor, A.P. Mathur, TMH.
- 2 The 8086 Microprocessor, Kenneth J Ayala, Cengage Learning
3. Fundamentals of microprocessor & microcomputers, B.Ram, Dhanpat Rai& Co.



EC-403LINEAR INTEGRATED CIRCUITS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction to Operational Amplifiers and Characteristics

Introduction, Block diagram, Characteristics and equivalent circuits of an ideal op-amp, Various types of operational amplifiers and their applications, Power supply configurations for OP-AMP applications, Inverting and non-inverting amplifier configurations.

Input offset voltage, Offset current, Thermal drift, Effect of variation in power supply voltage, Common-mode rejection ratio, Slew rate and its effect, PSRR and gain – bandwidth product, Frequency limitations and compensations, Transient response, Interpretation of TL082 datasheet.

UNIT-II

Amplifiers and Active Filters

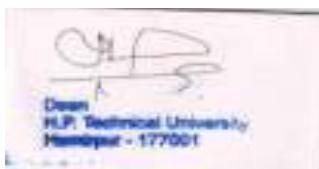
Summing amplifier, Integrators and differentiators, Instrumentation amplifier, Differential input and differential output amplifier, Voltage-series feedback amplifier, Voltage-shunt feedback amplifier, Log/ Antilog amplifier, Isolation amplifiers.

Characteristics of filters, Classification of filters, Magnitude and frequency response, Butter worth 1st and 2nd order low pass, high pass and band pass filters, Chebyshev filter characteristics, Band reject filters, Notch filter, All pass filters, Self-tuned filters

UNIT-III

Oscillators, Comparators and Converters

Triangular/rectangular wave generator, Phase-shift oscillators, Wein bridge oscillator, Comparator, Zero Crossing detector, Monostable and Astable multivibrator, Schmitt trigger, Voltage limiters, Clipper and clamps, Absolute value output circuit, Peak detector, Sample and hold circuit, Precision rectifiers, Voltage-to-current converter, Current-to-voltage converter.



UNIT-IV

Advanced applications and Power Supply

Design of frequency divider, PLL, AGC, AVC using OP-AMP and analog multipliers (MPY634),

Design of amplitude modulator and FSK circuit using OP-AMP and analog multiplier.

Unregulated power supplies, Zener diode voltage regulator, Simple OP-AMP voltage regulator, Fixed and adjustable voltage regulators, Dual power supply, Basic switching regulator and characteristics of standard regulator ICs – TPS40200, TPS40210, TPS 7A4901, TPS7A8300

Text Books

1. Linear integrated circuits Analysis, Design & Application, B. Somanathan Nair, Wiley India
2. OP-AMP and Linear IC's, Ramakant A.Gayakwad, PHI.

Reference Books

1. *Operational Amplifiers and Linear Integrated circuits*, Robert Coughlin and F Driscoll, Pearson Education Asia.
2. *Linear Integrated Circuits*, D. Roy Choudhry, Shail Jain, New Age International Pvt. Ltd.
3. *Op Amps and Linear Integrated circuits*, James M. Fiore, First reprint, Thomson Asia Pvt. Ltd.
4. *Operational Amplifier and LIC*, Bell, Oxford University Press.

Other References

1. Data sheet: <http://www.ti.com/lit/ds/symlink/tl082.pdf>
2. Application note: <http://www.ti.com/lit/an/sloa020a/sloa020a.pdf>
3. MPY634 data sheet: <http://www.ti.com/lit/ds/symlink/mpy634.pdf>
4. Application note: <http://www.ti.com/lit/an/sbfa006/sbfa006.pdf>
5. ASLK pro manual: ASLK manual
6. PMLK lab manual



EC-404PULSE SHAPING & WAVE GENERATION

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Linear Waveshaping

Introduction to high pass & low pass RC circuit, RC circuit as a differentiator and integrator (Implementing of step, pulse, square & ramp input), Attenuators, RL and RLC circuits, Ringing circuit.

Time Base Generators

General features of a time base signal, Methods of generating time base waveforms, Miller and Bootstrap time base generators, Current time base generators.

UNIT -II

Non-Linear Wave Shaping

A. Clippers

Diode clippers, Transistor clippers, Clipping at two independent levels, Transfer characteristics of clippers, Comparators, Applications of voltage comparators.

B. Clampers

Clamping operation, Clamping circuits using diode with different inputs, Effect of diode characteristics on clamping voltage, Transfer characteristics of clampers, Clamping circuit theorem.

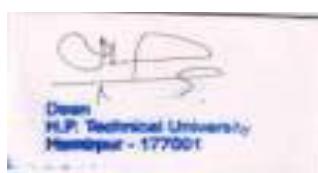
UNIT -III

SAMPLING GATES

Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Reduction of pedestal in gate circuits, Applications of sampling gates.

UJT & 555 Timer

UJT: Construction, Principle, UJT as relaxation amplifier, 555 timer – Basic structure, Pin description, Application of 555 timer as astable multivibrator.



UNIT -IV

Non-Sinusoidal Oscillators

Analysis and design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using transistors, Voltage controlled oscillator, Application of non-Sinusoidal oscillators.

Data Conversion Circuits

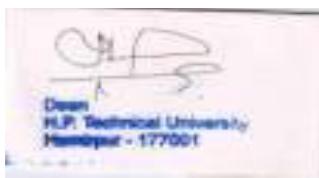
Digital to analog converters : Simple resistive network and binary ladder network, Analog to digital converter : counter type, Successive approximation type, flash type and dual slope integration type.

Text Books

1. *Pulse & Digital Circuits- Anand Kumar, PHI.*
2. *Pulse Digital & Switching Waveform- Jacob Millman, TMH.*
3. *Pulse & Digital Circuits- Rao. K Venkata, Pearson.*

Reference Books

1. *Fundamental of Electronics: Thomas, Morgan & Claypool Publishers.*
2. *Electronic Devices & Circuits- Salivahanan, TMH.*
3. *Electronic Devices & Circuit Theory- Boylestad, Pearson.*



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

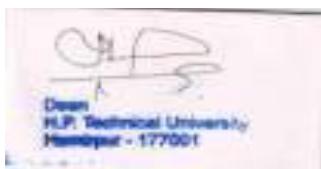
Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - GolakNath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.



UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial review of administrative actions, exclusion of judicial review and concept of “Ombudsman”; Right to Information Act, 2005 (Sub Section 1 - 20)

Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

10. D.D. Basu, *Shorter Constitution of India*, Prentice Hall of India, (1996)
11. MeenaRao, *Fundamental concepts in Law of Contract*, 3rd Edn. Professional Offset, (2006)
12. H.O.Agarwal, *International Law and Human Rights*, Central Law Publications, (2008)

Reference Books:

16. H.M. Seervai, *Constitutional Law of India*, Tripathi Publications, (1993).
17. S.K. Kapur, *Human Rights under International Law and Indian Law*, Central Law Agency, (2001)
18. NeelimaChandiramani, *The Law of Contract: An Outline*, 2nd Edn. Avinash Publications Mum, (2000)
19. Avtarsingh, *Law of Contract*, Eastern Book Co., (2002).
20. Anson W.R.(1979), *Law of Contract*, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verbenmituntrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

Wichtige Sprachhandlungen: Kleidung, Farben, Materialien.

Grammatik: formelle Imperativsätze mit "Sie" informelle Imperativsätze Vorschläge mit "wir" – "sollen/wollen wir" - Sollich? Modalpartikeln "doch" "mal" "doch mal".

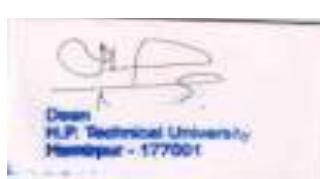
UNIT - III

Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ "alle", "man" Indefinitepronomen "etwas", "nichts".

UNIT - IV

Wichtige Sprachhandlungen: Essen und Trinken im Restaurant, Partyvorbereitung und Feier.



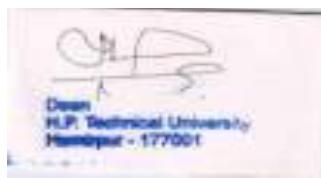
Grammatik: Nomen aus Adjektiven nach "etwas" und "nichts" Nomen aus dem Infinitiv von Verben, zusammengesetzte Nomen und ihre Artikel. Adjektive im Nom. und Akk. nach unbestimmten Artikel, Negativartikel und Possessivartikel.

TEXT BOOK

4. *Studio d A1. Deutsch als Fremdsprache with CD. (Kursbuch und Sprachtraining).*

REFERENCES

1. *German for Dummies*
2. *Schulz Griesbach*



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

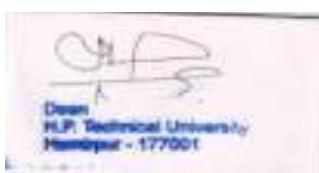
Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.

UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.



UNIT - IV

Grammar and Vocabulary –the verbs: manger, boire, the partitive articles

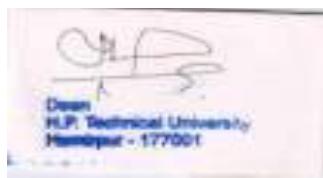
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading –reading a text.

TEXT BOOK

4. *Tech French*

REFERENCES

1. *French for Dummies*.
2. *French made easy: Goyal publishers*.
3. *Panorama*.



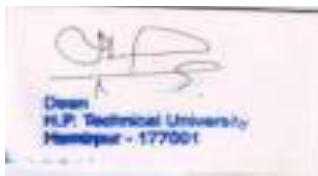
EC-405 MICROPROCESSOR & PERIPHERALS LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Microprocessor & peripherals lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

27. Addition and subtraction of two 8-bit numbers with programs based on different addressing modes of 8085A.
28. Addition and subtraction of two 16-bit numbers using 2's complement method.
29. Addition and subtraction of two 16-bit BCD numbers using DAA instruction.
30. Multiplication of two 8-bit numbers using the method of successive addition or shift & add method.
31. Division of two 8-bit numbers using the method of successive subtraction or shift & subtract method.
32. Program for block transfer and block exchange of data bytes.
33. Finding the smallest and largest element in a block of data.
34. Arranging the elements of a block of data in ascending and descending order.
35. Generating delays of different time intervals using delay subroutines.
36. To study the interfacing of 7 segment LED display with microprocessor.
37. To study the interfacing of ADC and DAC with microprocessor.
38. To study the interfacing of stepper motor with microprocessor.
39. To study and compare main features of Intel core i3, i5 and i7



EC-406 PULSE SHAPING, WAVE GENERATION AND LIC LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

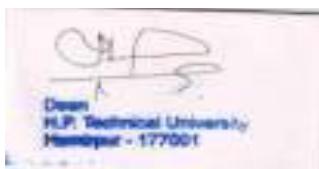
Experiments as per the topics in the syllabus for the course ‘Pulse shaping, wave generation and LIC lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

Hardware required

Required tools – Power supply, Function generator, Oscilloscope, TL082, MPY634, ASLKPRO, Standard regulator ICs – TPS40200, TPS40210, TPS 7A4901, TPS7A8300, PMLK and connecting wires.

List of Experiments

1. Study the characteristics of negative feedback amplifier using op-amp.
2. Design of an instrumentation amplifier using op-amp.
3. Study the characteristics of regenerative feedback system with extension to design an astable multivibrator.
4. Design low pass, high pass and band pass, stop band 2nd order Butterworth active filters using universal active filter topology.
5. Study Wein-bridge, phase shift oscillator and determine its frequency
6. Design of a function generator and VCO using op-Amp and MPY634
7. Examine the operation of a PLL designed using TL082 and MPY634 and to determine the free running frequency, the capture range and the lock in range of PLL
8. Design an AGC and AVC using TL082 and MPY634 for a given peak amplitude of sine wave.
9. Design a low drop out regulator using TL082 for a given voltage regulation characteristic and compare the characteristics with TPS7250 IC.
10. Design of a switched mode power supply that can provide a regulated output voltage for a given input range using the TPS40200 IC.
11. Design a DC-DC converter using TL082 and study the time and transient response.
12. With TPS7A4901 and TPS7A8300, study:
 - a. Impact of line and load conditions on drop out voltage
 - b. Impact of line and load conditions on efficiency
 - c. Impact of capacitor on PSRR
 - d. Impact of output capacitor on load-transient response



EC-407 ELECTRONIC WORKSHOP&ANALOG COMMUNICATION LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	3	2	30	20	50	3 hrs

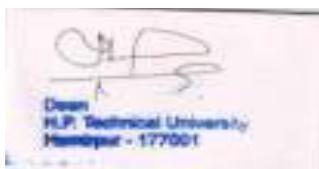
Experiments as per the topics in the syllabus for the course ‘PCB & Electronic workshop lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments

1. Art work and printing of simple PCB and visit to nearby silk screen printing facility.
2. Etching and drilling of PCB
3. Design and fabrication of DC regulated power supply using pre-fabricated PCB.
4. Introduction and hands on practice to use simulation software for circuit creation and simulation.
5. Design and fabrication of half adder circuit using PCB.
6. Design and fabrication of RLC resonant circuit using PCB.
7. To study Amplitude Modulation system.
8. Generation of DSB-SC signal using balanced modulator.
9. To study envelop detector for demodulation of AM signal and observe diagonal peak clipping effect.
10. To study Frequency Modulation system.
11. To study Pre-emphasis and De-emphasis.
12. To Study Super heterodyne receiver and measurement of receiver parameters like AGC, sensitivity, selectivity & fidelity.
13. Familiarization of PLL, measurement of lock and capture range, frequency demodulation.

Reference books

1. PCB Design, Walter Boshar TMH.
2. PCB Design, Coombs, McGraw Hill.
3. Integrated circuit Fabrication Technology Elliot, TMH.

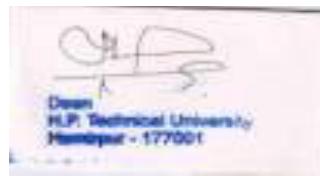


G. DETAILED SYLLABI OF COURSES

SCHEME OF TEACHING AND EXAMINATION B.TECH - ELECTRICAL ENGINEERING										
SEMESTER – III										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	EE-301	Electrical Machine -1	3	1	0	4	40	60	100
4	PC	EE-302	Power Electronics-I	3	1	0	4	40	60	100
5	PC	EC-302	Digital Electronics	3	0	0	4	40	60	100
6	PC	EC-303	Network Analysis & Synthesis	3	0	0	3	40	60	100
7	OE	-	Open Elective-I	2	0	0	2	40	60	100
Labs:										
1	PC	EE-311	Electrical Machine -1 Lab	0	0	2	1	30	20	50
2	PC	EE-312	Power Electronics-I Lab	0	0	2	1	30	20	50
3	PC	EE-313	Digital Electronics Lab	0	0	2	1	30	20	50
			Total	17	5	6	24+2	370	480	850

Open Elective-I

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS-306	Sociology & Elements of Indian History for Engineers	2	0	0	2	40	60	100
2	OE	HS-307	German Language - I	2	0	0	2	40	60	100
3	OE	HS-308	French Language - I	2	0	0	2	40	60	100



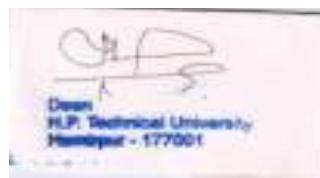
SCHEME OF TEACHING AND EXAMINATION
B.TECH - ELECTRICAL ENGINEERING

SEMESTER – IV

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Human Values and Professional Ethics	2	2	0	3	40	60	100
3	PC	EE-401	Electrical Machine-II	3	1	0	4	40	60	100
4	PC	EE-402	Electrical Measurement & Measuring Instruments	3	1	0	4	40	60	100
5	PC	EE-403	Transmission & Distribution of Electrical Power	3	1	0	4	40	60	100
6	PC	EE-404	Communication Engineering	3	1	0	4	40	60	100
7	OE	-	Open Elective-II	2	0	0	2	40	60	100
Labs:										
1	PC	EE-411	Electrical Machine-II Lab	0	0	2	1	30	20	50
2	PC	EE-412	Electrical Measurement & Measuring Instruments Lab	0	0	2	1	30	20	50
3	MC	EE-413	Electrical Simulation Lab-I	0	0	3	2	30	20	50
			Total	16	8	7	26+2	370	480	850

Open Elective-II

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS-410	Law for Engineers	2	0	0	2	40	60	100
2	OE	HS-411	German Language - II	2	0	0	2	40	60	100
3	OE	HS-412	French Language - II	2	0	0	2	40	60	100



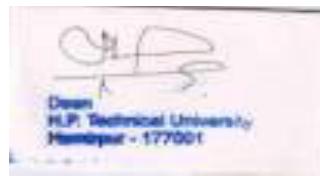
SCHEME OF TEACHING AND EXAMINATION
B.TECH - ELECTRICAL ENGINEERING

SEMESTER – V

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PC	EE-501	Power Electronics-II	3	1	0	4	40	60	100
2	PC	EE-502	Linear Control System	3	1	0	4	40	60	100
3	PC	EE-503	Electrical Power Generation	3	0	0	3	40	60	100
4	PC	EE-504	High Voltage Engineering	3	0	0	3	40	60	100
5	PC	EE-505	Electromagnetic Field Theory	3	1	0	4	40	60	100
6	PC	EE-506	Flexible AC Transmission System	3	1	0	4	40	60	100
7	OE	-	Open Elective-III	2	0	0	2	40	60	100
Labs:										
1	PC	EE-511	Power Electronics-II Lab	0	0	2	1	30	20	50
2	PC	EE-512	Linear Control System Lab	0	0	2	1	30	20	50
3	MC	EE-513	Electrical Simulation Lab-II	0	0	2	1	30	20	50
			Total	18	4	6	25	370	480	850

Open Elective-III

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS -501	Total Quality Management	2	0	0	2	40	60	100
2	OE	HS -502	Operating System	2	0	0	2	40	60	100
3	OE	HS -503	Remote Sensing & GIS	2	0	0	2	40	60	100

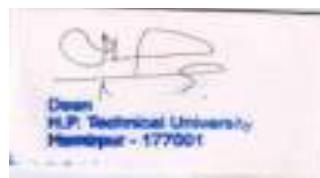


SCHEME OF TEACHING AND EXAMINATION B.TECH - ELECTRICAL ENGINEERING										
SEMESTER – VI										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	EE-601	Switchgear & Protection	3	0	0	3	40	60	100
2	PC	EE-602	Microprocessors & Its Applications	3	0	0	3	40	60	100
3	PC	EE-603	Power System Operation & Control	3	1	0	4	40	60	100
4	PC	EE-604	Electrical Drives	3	1	0	4	40	60	100
5	PC	EE-605	Digital Signal Processing	3	1	0	4	40	60	100
6.	PC	EE-606	Electrical Energy Utilization	3	0	0	3	40	60	100
7	OE	-	Programme Elective-I	3	0	0	3	40	60	100
Labs:										
1	PC	EE-611	Switchgear & Protection Lab	0	0	2	1	30	20	50
2	PC	EE-612	Microprocessors & Its Applications Lab	0	0	2	1	30	20	50
3	MC		Seminar	0	0	2	1	30	20	50
			Total	18	3	6	24	370	480	850

PROGRAMME ELECTIVE - I

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	EE-607	Advanced Control System	3	0	0	3	40	60	100
2	PE	EE-607	Illumination Engineering	3	0	0	3	40	60	100
3	PE	EE-608	Optical Fiber Communication Technology	3	0	0	3	40	60	100

Industrial /Practical Training after VIth Semester of six weeks duration



SCHEME OF TEACHING AND EXAMINATION
B.TECH - ELECTRICAL ENGINEERING

SEMESTER – VII

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	EE-701	Energy Management	3	0	0	3	40	60	100
2	PC	EE-702	Electrical Power Quality	3	0	0	3	40	60	100
3	PC	EE-703	Non-conventional Electrical Power Generation	3	0	0	3	40	60	100
4	PC	EE-704	Testing & Commissioning of Electrical Equipments	3	0	0	3	40	60	100
5	OE	-	Programme Elective-II	3	0	0	3	40	60	100
Labs:										
6	MC	EE-711	Project Work -I	0	0	4	2	30	20	50
7	PC	EE-712	Industrial /Practical Training(Viva-Voce)	0	0	4	2	30	20	50
8	MC	EE-713	Electrical Simulation Lab-III	0	0	2	1	30	20	50
			Total	12	0	10	17	290	360	650

PROGRAMME ELECTIVE-II

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	EE-705	Hydro Power Station Design	3	0	0	3	40	60	100
2	PE	EE-706	Electrical Machine Design	3	0	0	3	40	60	100
3	PE	EE-707	High Voltage DC Transmission System	3	0	0	3	40	60	100



SCHEME OF TEACHING AND EXAMINATION
B.TECH - ELECTRICAL ENGINEERING

SEMESTER – VIII

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PE		Programme Elective - III	3	0	0	3	40	60	100
2	PE		Programme Elective - IV	3	0	0	3	40	60	100
3	MC	EE-801	Project Work - II	0	0	16	8	40	60	100
			Total	6	0	16	8+6	120	180	300
OR										
4	MC	EE-802	Industrial Project	0	0	16	8	40	60	100
			Total	0	0	16	8	40	60	100

PROGRAMME ELECTIVE-III

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	EE-803	Power System Planning	3	0	0	3	40	60	100
2	PE	EE-804	Direct Energy Conversation	3	0	0	3	40	60	100
3	PE	EE-805	Neural Network & Fuzzy Logic	3	0	0	3	40	60	100

PROGRAMME ELECTIVE-IV

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	EE-806	Power System Stability	3	0	0	3	40	60	100
2	PE	EE-807	Optimization Techniques	3	0	0	3	40	60	100
3	PE	EE-808	Advanced Power Electronics	3	0	0	3	40	60	100

Note: Industrial Project of Four months duration is to be carried out by the student exclusively in industry under the joint supervision of faculty advisers from institution as well as from the industry.



SEMESTER III



MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties - Function of Random variables.

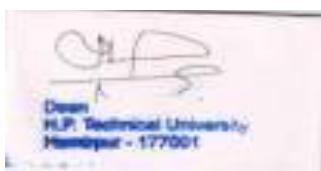
UNIT – III

Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

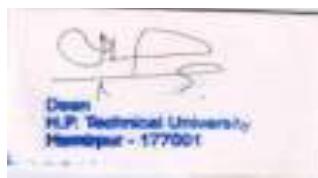


Text Books:

13. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
14. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
15. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers", 5th Edition, 2011.

Reference books:

13. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearson Education, Delhi, 2002.
14. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
15. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists" 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics - Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

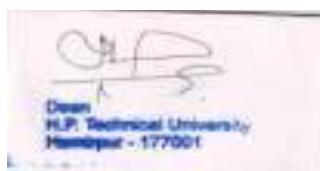
UNIT - II

Value Analysis - Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management; organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.



Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages,incentives, recruitment, training and industrial relations.

UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet, break evenanalysis - basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketingenvironment, marketing mix, advertising and sales promotion.

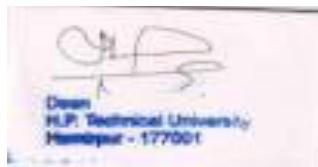
Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

Text Books:

9. PanneerSelvam, R, “*Engineering Economics*”, Prentice Hall of India Ltd, New Delhi.
10. Dwivedi, D.N., “*Managerial Economics, 7/E*”, Vikas Publishing House.

Reference Books:

41. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., “*Engg. Economy 15/E*”,Prentice Hall, New York, 2011.
42. Chan S. Park, “*Contemporary Engineering Economics*”, Prentice Hall of India, 2002.
43. F. Mazda, *Engg.Management*, Addison Wesley, Longman Ltd., 1998.
44. O. P. Khanna, *Industrial Engg.and Management*,DhanpatRai and Sons, Delhi, 2003.
45. P. Kotler, *Marketing Management, Analysis, Planning, Implementation and Control*,Prentice Hall, New Jersey, 2001.
46. VenkataRatnam C.S &Srivastva B.K,*Personnel Management and Human Resources*, Tata McGraw Hill.
47. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill.
48. Bhattacharya A.K., *Principles and Practice of Cost Accounting*, Wheeler Publishing.
49. Weist and Levy, *A Management guide to PERT and CPM*, Prantice Hall of India.
50. Koontz H,O'Donnell C.,&Weihrich H, *Essentials of Management*, McGraw Hill.



EE-301 ELECTRICALMACHINES-I

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Unit-I

Hours-8

Single-Phase

Transformers: principle of transformer operation, emf equation, voltage ratio and turns ratio, construction of single-phase transformers, ideal transformer, transformer on no load: phasor diagram and equivalent circuit, practical transformer: phasor diagram and equivalent circuit, voltage regulation, losses, open circuit, short circuit, back-to-back test, transformer efficiency, condition for maximum efficiency, per unit transformer values, all day efficiency.

Single-phase autotransformer, volt-ampere relation, step-up autotransformer, autotransformer efficiency, saving in conductor material, conversion of a two-winding transformer to an autotransformer, advantages & disadvantages of autotransformer, applications of autotransformer.

Unit-II

Hours-8

Three- phase Transformer:

Three-phase transformer,Comparison between three phase transformer bank and three phase transformer units,three-phase transformerconstruction,three-phase transformergroups,three-phase transformerconnections, factorsaffectingthe choiceofconnections,delta-deltaconnection,star-starconnection,star-deltaconnection,delta-star connection, open delta connection, scott three-phase/two phaseconnection, Comparison of Distribution and Power Transformer ,applicationoftransformers

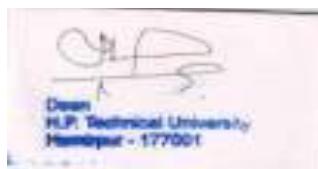
Three winding transformers: equivalent circuit, determination of parameters, voltage regulation, polarity of the transformers, parallel operation of single-phase transformers and Three-phase transformers, wave shape of no load (exciting) current, inrush of magnetizing current, construction of current transformers and voltage transformers, transformer cooling.

Unit-III

Hours-8

DCMachines-I:basicstructure

of electric machine, dc generator construction, equivalent circuit of dc machine, type of dc machine, emf equation of dc machine, armature reaction in dc generators, commutation, methods of improving commutation, demagnetizing and cross magnetizing ampere turns, characteristics of dc generator.

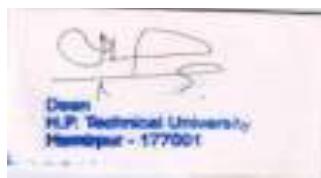


Unit-IV**Hours-8**

DC Machine-II: Motor principle, significance of back emf, equivalent circuit of a dc motor, torque equation of dc motor, types of dc motor, characteristics of shunt, series & compound motors, speed control of dc motors, starting of dc motors & starters, losses in dc machine, efficiency of a dc machine, testing of dc machines, application of dc machines.

Recommended Books:

1. "Electrical Machinery" by P.S. Bimbhra, Khanna Publishers, Delhi.
2. "Generalized theory of electrical machines" by P. S. Bimbhra, Khanna Publishers, Delhi.
3. "Electric Machinery" by Fitzgerald & Kingsley, MGH.



EE-302: POWERELECTRONICS-I

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Unit-I

Hours-06

Powerelectronicsdevices: Role of powerelectronics, construction and characteristics of power diode, power transistor, power MOSFET, SCR, GTO, TRIAC & DIAC. SCR: two transistor model, methods of turn-on, R, RC and UJT firing circuit, commutation techniques, series and parallel operation.

Unit-II

Hours-10

Phase-controlled converters (AC to DC converters): One, two, three, six pulse converters, fully and half controlled converters, load voltage waveforms with different types of loads, output voltage equations, continuous and discontinuous modes of operation, input power factor of converter, reactive power demand, effect of source inductance, introduction of four quadrant/dual converter.

Unit-III

Hours-08

Cycloconverters (AC to AC converters): basic principle of frequency conversion, types of cycloconverter, principle of operation of step up and step down cycloconverter, single-phase to single-phase cycloconverter with resistive and inductive load. Three-phase to single-phase cycloconverter, three-phase to three-phase cycloconverter, output voltage equation of cycloconverter.

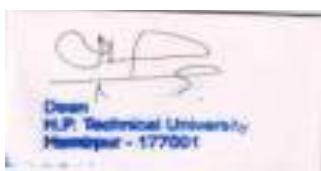
Unit-IV

Hours-08

Choppers (DC to DC converter): classification of choppers, principle of operation, steady state analysis of class-achoppers, step up chopper: steady state analysis, current commutated and voltage commutated chopper, output voltage control techniques, one, two and four quadrant choppers.

Recommended Books:

1. "Power Electronics: Circuits, Devices & Applications" by M.H. Rashid, Prentice Hall of India Ltd, 2004.
2. "Power Electronics" by P.S. Bimbhra, Khanna Publishers, 2006.
3. "Power Electronics" by M.D. Singh and K.B. Khanchandani, Tata McGraw Hill Pub, 2005.
4. "Power Electronics: Converters, Applications and Design" by Ned Mohan, T.M. Undeland.



EC-302 DIGITAL ELECTRONICS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Number system & codes:- Binary arithmetic (Addition, Subtraction, Multiplication and Division), Floating point numbers. Diminished radix and radix compliments, BCD codes, 8421 code, Excess-3 code, Gray code, Error detection and correction: Parity code, Hamming code.

Logic Gates:- Positive & negative logic, Tristate logic gates, Schmitt gates, Totem pole output and open collector output; Fan in and Fan out of logic gates, Buffer & trans-receivers, IEEE/ANSI standards symbols.

UNIT-II

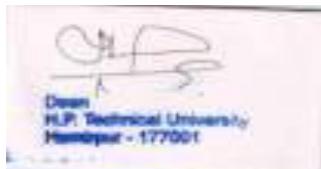
Boolean algebra simplification techniques:- Sum of products and product of sums simplification, NAND and NOR implementation,

Incompletely specified functions, Ex-OR functions, The map method: Two, Three, Four and Fivevariable maps; The tabulation method, Determination of prime implicants, Selection of essential prime implicants.

Logic families:- Classification of digital IC's, Significance & types, Characteristics parameters, TTL, ECL, CMOS logic families, NMOS & PMOS logic, Interfacing between TTL & CMOS.

UNIT-III:- Combinational logic circuits

Implementing combinational logic, Arithmetic circuits: Half adder, Full adder, Half subtractor, Full subtractor; Multiplexer, Encoder, Demultiplexer & Decoder.



Flip flops:- Introduction, S-R flip -flops, Level & edge triggered flip flops, JK flip-flop, D flip-flop, T flip-flop, Master slave JK flip-flop, Flip flop timing parameters & applications.

UNIT-IV

Shift Registers:- Shift register, Ring counter, Universal shift registers, SISO, PISO, SIPO & PIPO.

Counters:- Asynchronous ripple counter, Synchronous counter, Modulus of a counter, Binary ripple counter, Up& down, Decade counter.

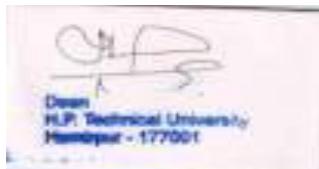
Semiconductor Memories:- Classification of memories, ROM, RAM, Static memory and Dynamic memory. Programmable logic arrays, Charged-coupled device memory

Text Books

10. Digital Electronics -Principle & Integrated circuits, Anil K Maini, Wiley India edition
11. Modern Digital Electronics, R.P.Jain, TMH
12. M. Morris Mano, Digital Design, Prentice Hall of India.

Reference Books

7. Digital Principle and Applications, Malvino and Leach, TMH
8. Digital Electronics, Kharate, Oxford University Press



Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Analysis of coupled circuits and application of network theorem in AC circuits

Active element conventions: Modelling of coupled circuits, Dot convention in coupled circuits; Network theorems in AC circuits: Thevenin's and Norton's theorems, Superposition theorem, Reciprocity and maximum power transfer theorem.

Graph theory and network equations

Introduction and graph of a network, The incidence matrix, Fundamental cut set matrix, Fundamental tie set matrix and loop currents, Relation between various matrices. Network equilibrium equations: using KVL and KCL; Networks with mutual inductance, Duality.

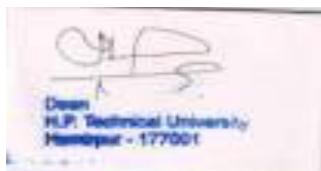
UNIT-II

Application of Laplace transform in circuit analysis

Review of Laplace transform: Definition of Laplace transform and its inverse, Laplace transform of basic functions, Properties of Laplace transform; Application of Laplace transforms in circuit analysis: Transformation of time domain circuit components to s- domain, Laplace transform to solution of network problems.

Transient response

Transient response of R-L, R-C, R-L-C circuits(series combinations only) for DC and sinusoidal excitations.



UNIT-III

Two port networks

Concept of two port networks, Classification of parameters: Open circuit and Short circuit parameters, Transmission and inverse transmission parameters, Hybrid and inverse hybrid parameters; Condition for reciprocity and symmetry, Inter-relationship between the parameters. Interconnection of two port networks: Series, Parallel, Cascade and series-parallel connection. T and pi representations.

UNIT-IV

Fundamentals of network synthesis

Network functions, Concept of poles and zeros, Necessary condition of a stability of a network function.

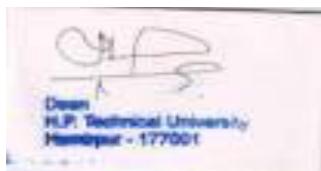
Hurwitz polynomial and its properties, Positive real function, Properties of positive real functions, Testing a positive real function, Synthesis of R-L, R-C and L-C driving point functions: Foster and Cauer forms.

Text Books

4. Fundamentals of Electric circuits, Charles K Alexander, Matthew N O Sadiku, TMH
5. Circuit Theory -Analysis and synthesis, A. Chakrabarti, Dhanpat Rai & co.
6. Network analysis and synthesis, Franklin F. Kuc, PHI.

Reference Books

5. Networks and Systems, D. Roy Choudhury, New Age International.
6. Network Analysis, Van Valkenberg, PHI
7. Engineering Circuit Analysis, William Hayt and Jack Kemmerly, TMH
8. Circuits and Networks- Analysis and Synthesis, A. Sudhakar and S.P. Shyam Mohan, TMH



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT- I

Introduction to sociological concepts - structure, system, organization, social institution, Culture social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT –II

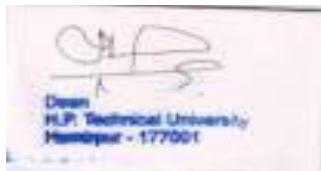
Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

UNIT –III

Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.



UNIT - IV

From feudalism to colonialism -the coming of British; Modernity and struggle for independence.

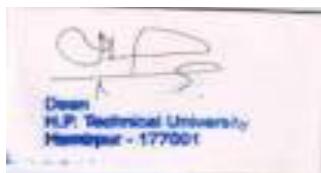
Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India
2ndphase (LPG decade post 1991)

Text Books:

13. Desai, A.R. (2005), Social Background of Indian Nationalism, Popular Prakashan.
14. Giddens, A (2009), Sociology, Polity, 6thEdition.
15. Chandoke, Neera& Praveen Priyadarshi(2009), contemporary India: Economy, Society and Politics, Pearson.

Reference Books:

17. Guha, Ramachandra(2007), India After Gandhi, Pan Macmillan.
18. Haralambos M, RM Heald, M Holborn (2000), Sociology, Collins.
19. Sharma R. S..(1965), Indian feudalism, Macmillan.
20. Gadgil, Madhab&RamchandraGuha(1999) - This Fissured Land: An Ecological Histry of India, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßigeVerbenimPräsens - “sein” und habenimPräsens - PersonalpronomenimNominativ.

UNIT- II

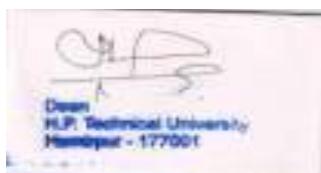
WichtigeSprachhandlungen: TelefonNummernverstehen und sprechenUhrzeitenverstehen und sagenVerneinung “nicht und kein” (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notierenbestimmter und unbestimmterArtikelundNegativartikelim Nom. &Akkusativ

UNIT- III

WichtigeSprachhandlungen: Tageszeitenverstehen und überTerminesprechen- Verabredungenverstehen - AufgabenimHaushaltverstehen

Grammatik: PersonalpronomenimAkkusativ und Dativ - W-Fragen “wie, wer, wohin, wo, was usw.-GenitivbeiPersonennamen - ModalverbenimPräsens “können, müssen,möchten”



UNIT - IV

WichtigeSprachhandlungen:Sichaustauschen, was man kann, muss –BezeichnungenLebensmittel – Mengenangabenverstehen – PreiseverstehenundEinkaufzettelschreiben

Grammatik:Wortstellung in SätzenmitModalverben – Konnektor ”und” – “noch”-kein-----mehr – “wieviel, wieviele, wie alt, wielange” –PossessivartikelimNominativ.

UNIT V

WichtigeSprachhandlungen:Freizeitanzeigenverstehen

HobbysandSportartenAnzeigenfürFreizeitpartnerschreibenbzw. daraufantworten –Vorlieben und Abneigungenausdrucken

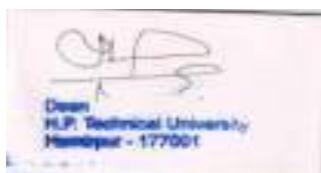
Grammatik:VerbenmitVokalwechselimPräsens – ModalverbenimPräsens“dürfen, wollen und mögen - “haben und sein” imPräteritum – regelmäßigeVerbenimPerfekt – Konnektoren “denn, oder, aber.

TEXT BOOK

1. Studio d A1. Deutsch alsFremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verbof self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the Frenchalphabet and the accents that play a vital role in the pronunciation of the words.

Writing:Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subjectpronouns.

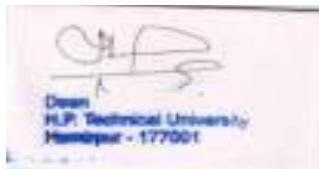
Listening and Speaking: Pronunciation of words like Isabelle, presentezandla liaison – vousetes, vousappelez and role play of introducing each other –group activity.

Writing:Particulars in filling an enrolment / registration form.

Reading Comprehension: reading a text of a famous scientist and answeringquestions.

UNIT – III

Grammar and Vocabulary:Verb of possession “avoir’ and 1st group verbs“er”, possessive adjectives and pronouns of insistence- moi, lui..andnumbers from 0 to 20.



Listening and Speaking: Nasal sounds of the words like feminine, ceinture,parfum and how to ask simple questions on one's name, age, nationality,address mail id and telephone number.

Writing:Conjugations of first group verbs and paragraph writing on self –introduction and introducing a third person.

Reading Comprehension: reading a text that speaks of one's profile andanswering questions

UNIT – IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb “aimer” and seasons of the year and leisure activities.

Listening and Speaking: To express one's likes and dislikes and to talk ofone's pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing-Conjugations of the irregular verbs: faire and savoir and their usage.Paragraph writing on one's leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one's way and to give directions, verbes-pouvoir and vouloir and 2nd group verbs, a droite, la premiere a gauche and vocabulary relating to accommodation.

Listening and Speaking:To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing:Paragraph writing describing the accommodation using the different prepositions like en face de, derriere- to locate.

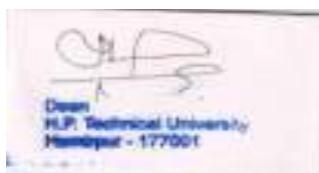
Reading Comprehension:A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliotheque?.....

TEXT BOOK

1. Tech French

REFERENCES

1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



EE-311: ELECTRICALMACHINES-ILAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

LISTOFEXPERIMENTS:

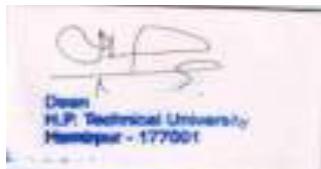
TRANSFORMERS

1. To find turns ratio & polarity of single-phase transformer.
2. To perform open & short circuit tests on single-phase transformer.
3. To perform Sumpner's (Back-to-Back) test on two identical 1-Φ transformers.
4. Parallel operation of two single-phase transformers & to study the load shared by each transformer.
5. To convert three-phase to Two-phase By Scott-connection of transformers.

DCMACHINES

6. To plot the magnetizing characteristics of a dc generator running at rated speed.
7. To obtain and plot the external characteristics of a dc shunt generators & to deduce the internal characteristics from the above.
8. To perform load test on DC shunt generator.
9. Speed control of DC shunt motor.
10. Swinburne's test of DC shunt motor.
11. To obtain and plot the characteristics of DC series motor.
12. To perform load test on DC series motor.

NOTE: At least eight experiments are to be performed in the semester from the above list.



Recommended Books:

“Experimentation and viva voice one electrical machines” by V.N.Mittal & A.Mittal,
Standard Publications.



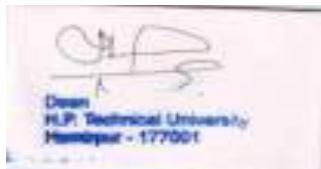
EE-312: POWER ELECTRONICS-ILAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

LIST OF EXPERIMENTS:

1. Experiment to study characteristics of diode, SCR and TRIAC.
2. Experiment to study characteristics of transistor and MOSFET.
3. Experiment to study R and R-C firing circuits.
4. Experiment to study UJT firing circuit.
5. Experiment to study AC phase control.
6. To study three-phase full-wave uncontrolled rectifier operation with R and R-L load and observe its input/output Wave form.
7. Experiment to study dc chopper.
8. Experiment to study single-phase cycloconverter characteristics.
9. To study single-phase full wave controlled rectifier using SCR and UJT with R and R-L load and observe its input/output Waveform with and without freewheeling (commutating) diode.
10. Experiment to study Lamp-Dimmer circuit using Diac & Triac with lamp load.

Note: At least eight experiments have to be performed in this semester from the above list.



EE-313 DIGITAL ELECTRONICS LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

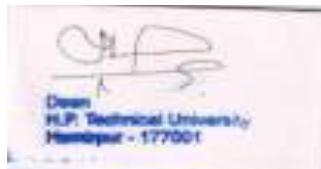
LIST OF EXPERIMENTS

1. Verify truth tables of AND, OR, NOT, NAND, NOR and XOR gates.
2. Implement (i) half adder (ii) full adder using AND-OR gates.
3. Implement full adder using NAND gates as two level realization.
4. Implement full subtractor using 8-to-1 multiplexer.
5. Verify truth tables of RS & JK flip flops and convert JK flip flops into D type & T type flip flops.
6. Use 555 timer as (i) monostable (ii) astable multivibrator.
7. (a) Use of 4-bit shift register for shift left and shift right operations. (b) Use 4-bit shift register as ring counter.
8. Implement mod-10 counter and draw its output waveforms.
9. Implement 4-bit DAC using binary weighted resistance technique / R-2R ladder network technique.
10. Implement 8-bit ADC using IC (ADC0800/0801).
11. a) Implement (i) Single level clipping circuit (ii) Two level clipping circuit.
b) Implement clamping circuit to clamp at peak+ve voltage/peak-ve voltage of an input signal.

ADDITIONAL EXERCISES:

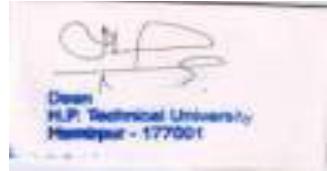
1. Construct bounce less switch.
2. Construct pulses of 1 Hz and 10 Hz, 1 kHz and manual.
3. Construct logic state detector.
4. Construct opto-sensor based.
 - a. Measurement of rotational speed of motor.
 - b. Measurement time elapsed between two events.
 - c. Measurement of linear velocity.
 - d. Measurement of acceleration.
5. Construct a memory using TTL Circuits. Read and write data onto a memory from bus.
6. Construct a security latch that can be operated by an identity card.

Note: At least eight experiments have to be performed in the semester from the above list.



SEMESTER IV

270



MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

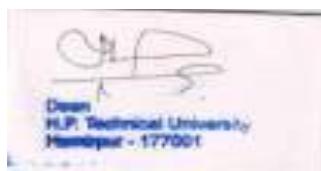
Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

UNIT – II

Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.



UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.

Approximation methods for nonlinear programming: Line search methods, gradient methods, conjugate gradient methods; Networking techniques – PERT and CPM.

UNIT - IV

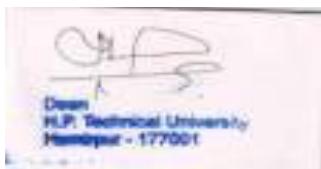
Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and its role in minimization, minimization under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

17. C. B. Gupta, “Optimization Techniques in Operation Research,” I. K. International Publishing House Pvt. Ltd.
18. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
19. Mukesh Kumar Singh, “Calculus Of Variations” Krishna Prakashan Media (P) Ltd.
20. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

21. I. M. Gelf and S. V. Fomin, “Calculus of Variations” Dover Publications IncMineola, New York.
22. Purna Chand Biswal, “Optimization in Engineering, Scitech Publications India Pvt. Ltd.
23. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
24. G. Hadly, Linear Programming, Narosa Publishing House.
25. KantiSwarup, P. K. Gupta and Manmohan, “Operations Research,” Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

5. Understanding the need , basic guidelines, content and process of value Education
6. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

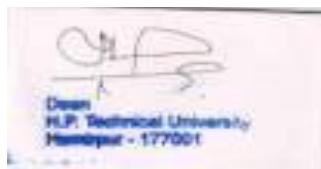
9. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
10. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
11. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
12. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

7. Understanding human being as a co-existence of the self and the body.
8. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
9. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

5. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’



6. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.

UNIT V: Harmony in Family, Society and Nature

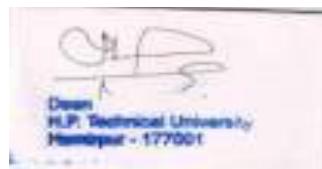
7. Understanding harmony in the family, society and nature.
8. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.
9. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

5. R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).
6. R R Gaur, R Sangal and G P Bagaria, Teacher's Manual (English), 2009.

Reference Books

13. E.F. Schumacher, Small is Beautiful; a study of economics as if people mattered, Blond & Briggs, Bratain, 1973.
14. PL Dhar, RR Gaur, Science and Humanism, common wealth publishers, 1990.
15. A.N. Tripathy, Human values, New Age International Publishers, 2003.
16. E.G. Seebauer& Robert, L BERRY, Foundational of Ethics for Scientists &Engineers, Oxford University Press, 2000.
17. M. Govindrajran, S.Natrajan& V.S. Senti Kumar, Engineering Ethics (including human Values), Eastern Economy Edition, Prentice hall of India Ltd.
18. B.L. Bajpai, 2004, Indian Ethos and Modern Management, New Royal book Co; Lucknow, 2004, Reprinted 2008.



EE-401: ELECTRICALMACHINES-II

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Unit-I

Hours-08

Three-phase Inductionmachine:Constructionalfeatures, Rotating magnetic field,production oftorque,phasordiagram,equivalentcircuit, performanceanalysis, torqueslip characteristics, no-loadandblockedrotor test, loadtest, effect ofrotor resistance, induction Generator.

Deep bar and doublecageinduction motor, starting method ofsquirrel cageand woundrotor inductionmotor, variousmethodsofspeedcontrolofsquirrelcage andwoundrotorinductionmotor.

Unit-II

Hours-07

Singlephaseinductionmotors:Introduction,productionofrotatingfields,principle,double revolvingfield theory,rotorslip,equivalentcircuit,determination ofequivalentcircuitparameters,starting methods,types of single-phaseinductionmotors,characteristics andapplicationsof single-phasemotors.

Unit-III

Hours-08

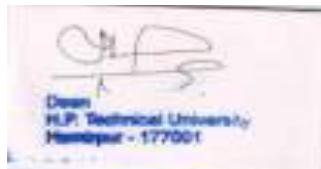
Synchronousgenerators:Introduction, synchronousmachines,emfequation,armature factor,distributionfactor,actualvoltagegenerated,armatureleakagereactance,armature reaction,synchronous impedance,equivalentcircuit&Phasordiagram,voltage regulation,measurementofsynchronousimpedance.

Twoactiontheory,salientpole synchronousmachine- twoactionmodel,torque anglecharacteristicof salientpolesynchronousmachine,maximumreactivepowerforasynchronousgenerator, determination of X_d and X_q ,paralleloperation of alternators,synchronizing powerand synchronizing torque coefficient,transientconditionssofarternators.

Unit-IV

Hours-07

Synchronous motors:Introduction,construction,principleofoperation,mainfeatures,equivalent circuitandphasordiagram ofcylindricalrotorsynchronousmotor,differenttorquesinsynchronous motor,effectofvarying excitation andloadchanges,synchronousmotorVcurvesand invertedVcurves,starting ofsynchronous motors,hunting,synchronous condenser,applicationsof synchronousmotors.



Recommended Books:

1. "Electrical Machinery" by P.S. Bimbhra, Khanna Publishers, Delhi.
2. "Generalized theory of electrical machines" by P.S. Bimbhra, Khanna Publishers, Delhi.
3. "Electric Machinery" by Fitzgerald & Kingsley, MGH.



EE-402 ELECTRICAL MEASUREMENTS AND MEASURING INSTRUMENTS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Unit-I

Hours-8

Measuring Systemfundamentals: Classification of Instruments (Absolute & Secondary Instruments; Indicating, Recording & Integrating instruments; Based upon Principle of operation), three forces in Electromechanical Indicating Instrument (Deflecting, controlling & damping forces), Comparison between gravity & spring controls, Comparison of damping methods & their suitability.

Units Standards & Errors: S.I units, Absolute standards (International, Primary, Secondary & Working Standards), True Value, Errors (Gross, Systematic, Random); Static Characteristic of Instruments (Accuracy, Precision, Sensitivity, Resolution & threshold).

Transducers : Classification of transducers (Active, Passive, Primary & secondary), Basic construction and principle of LVDT, Strain gauge and Thermocouple transducers.

Unit-II

Hours-8

Measuring instruments: Construction, operating principle, Torque equation, Shape of scale, use as Ammeter or as Voltmeter (Extension of Range), Use on AC/DC or both, Advantages & disadvantages, Errors (Both on AC/DC) of PMMC types, Electrodynamics Type, Moving iron type (attraction, repulsion & combined types), Hot wire type, Induction type & Electrostatic type Instruments.

Wattmeter & Energy Meters: Construction, operating principle, Torque equation, Shape of scale, Errors, Advantages & Disadvantages of Electrodynamics & Induction type Wattmeter & single phase induction type Energy meter, Compensation & Creep in energy meter.

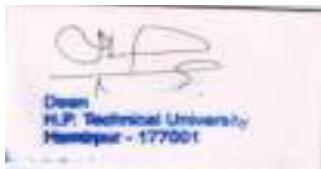
Unit-III

Hours-8

Power Factor & Frequency Meters: Construction, operation, principle, Torque equation, advantages & disadvantages of Single-phase power factor meters (Electrodynamics & Moving Iron types) & Frequency meters (Electrical Resonance, Ferrodynamic & Electrodynamictypes).

Resistance Measurement

Low & High Resistance Measurements: Limitations of Wheatstone bridge; Kelvin's double bridge method, Difficulties in high resistance measurements, Measurement of high resistance by direct deflection, loss of charge method, Megohm bridge & Meggar.

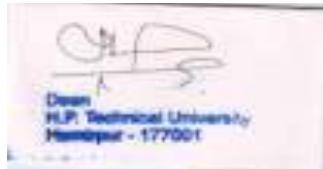


UNIT-IV**Hours-8**

A.C.Bridges: General balance equation, Circuit diagram, Phasor diagram, advantages, disadvantages, applications of Maxwell's inductance, inductance-capacitance, Hays, Anderson, Owens, De-Sauty's, Schering & Weins bridges, Shielding & earthing.

Recommended**books**

1. A Course in Elect. & Electronic Measurement & Instrumentation by A. K. Sawhney; Khanna Pub.
2. Electronic & Elect. Measurement & Instrumentation by J. B. Gupta; Kataria & Sons.
3. Electrical Measurements by E. W. Golding
4. Electronic Measurement and Measuring technique by W. D. Cooper & A. D. Helfrick.
5. Measuring Systems by E. O. Doeblin; TMH Publishers.



EE-403: TRANSMISSION& DISTRIBUTION OF ELECTRICAL POWER

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Unit-I

Hours-8

Introduction: Structure

of a power system, indoor and outdoor substations, equipment for substation layout, auxiliary supply.

Distribution Systems:

Radial, ring mains and network distribution system, comparison of various types of Supply systems (overhead).

Unit-II

Hours-8

Transmission Lines Parameters: Introduction: inductance of a conductor due to internal flux and external flux, inductance of a single phase two-wire line, inductance of three-phase line, capacitance of three-phase line, charging current due to capacitance, skin effect, Ferranti effect, proximity effect.

Performance of Lines: Models of short, medium and long transmission lines, performance of transmission lines, capacity of synchronous condenser, tuned lines, voltage control

Unit-

III Hours-8

Corona: Corona phenomenon, formation, Calculation of potential gradient, corona loss, factor affecting corona, method of reducing corona.

Insulators: Types of insulator and application, voltage distribution over insulator string, Method of equalizing the potential gradient, String efficiency, insulator failures, testing of the insulators.

UnitIV

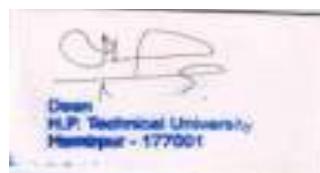
Hours-8

Mechanical Design: Sag and stress calculations, effect of ice and wind, string chart, line supports, conductor material, dampers

Cables: Types of cables, construction of cables, grading of cables, capacitance, ratings, power factor in cables, thermal characteristics and applications.

Recommended Books:

1. Power System Engg: by I.J.Nagrath and D.P.Kothari (TMH)
2. A Course in Electrical Power by Gupta, Soni & Bhatnagar (Dhanpat Rai & Sons).
3. Power system by Aqshaf Hussain, Dhanpat Rai, Delhi
4. Elements of power system analysis by W.D. Stevenson (MGH)
5. Electric Power by S.L.Uppal (Khanna Pub.)
6. Electrical power by J.B.Gupta (S.K.Kataria & Sons).
7. Power System Engineering by B.R. Gupta.
8. Electric Power System by B.M. Weedy, John Wiley & Sons.
9. Transmission & Distribution of Electrical Engineering by H.Cotton.



EE-404: COMMUNICATION ENGINEERING

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Unit-I Hours-8

Frequency BandsAndSignals: Variousfrequency bandsusedforcommunicationand theirspecial features,Need forwirelesscommunication,Typesofcommunication basedonmodulation systems,typesof varioussignals.

ModulationTechniques: Introduction to AM, FM, PM, PCM, PPM, DSBSC, SSB,,vestigialside bandsystem.

comparisonbetweenanaloganddigitalmodulation,frequencydivisionmultiplexingandtimedivisionmultiplexing.

Unit-II Hours-9

Amplitude Modulation: RepresentationsofAM, Frequency spectrumofAMWaves, need anddescriptionsofSSB,suppressionofcarrier.

AMTRANSMITTERS:generationof AM, LowLevelandHigh-level modulation,Comparisonof levels,AMtransmitterblockdiagram, collectorclassC modulator, andBasemodulator,DSBS/CModulator.

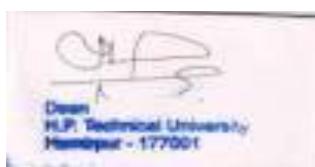
AMRECEVIER:Tuned radio frequency (TRF)receiver,Superheterodyne receiver,RFsection and characteristics,mixers,frequencychangingandtracking,IFrejection andIFamplifiers,detection and automatic gaincontrol(AGC),AM receivercharacteristics.

Unit-III Hours-8

Frequency Modulation: MathematicalrepresentationofFM,Frequency spectrumoftheFMwaves, wideband andnarrowbandFM.

FMTRANSMITTERS:Basicrequirementsandgenerationof FM,
FModulationmethods:Directmethods,varacterdiodemethods,FETreactancemodulator,Transistor reactancemodulation,Pre-emphasis,directFMmodulator,AFMin reactancemodulation,RCPhase modulation,ArmstrongFMsystems. Shift

FMRECIVERS:Limiters,singleanddouble tuneddemodulator,balancedslopedetector,fosterseelyofphase discriminator,de-emphasis,ratiotdetector,blockoffMreceiver,RFamplifiers, FMreceivercharacteristics.



Unit-IV

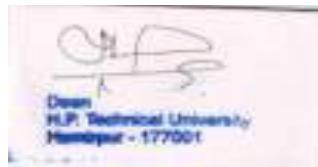
Hours-9

Digital Modulation: Broad overview of PCM, DM, and ADM. Review of sampling, flat top sampling, quantization, Analog to digital conversion, overview of performance of an long modulation scheme in presence of noise. Digital modulation techniques (ASK, FSK, BPSK, QPSK, M-ary PSK).

An introduction to satellite communication.

Recommended Books:

1. Electronic communication systems by Kennedy/TMH
2. Communication systems by Taub & Schilling/TMH
3. Communications systems by Simon Haykins/John Wiley & sons
4. Communications systems by Bruce Carlson
5. Communications systems by Singh & Sapre/TMH



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

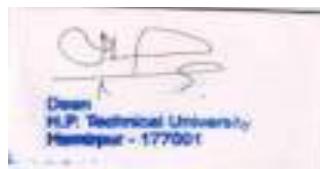
Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - GolakNath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.



UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial review of administrative actions, exclusion of judicial review and concept of “Ombudsman”; Right to Information Act, 2005 (Sub Section 1 - 20)

Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

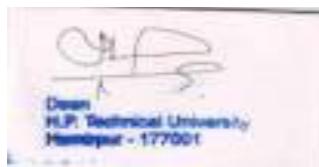
Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

13. D.D. Basu, Shorter Constitution of India, Prentice Hall of India, (1996)
14. MeenaRao, Fundamental concepts in Law of Contract, 3rd Edn. Professional Offset, (2006)
15. H.O.Agarwal, International Law and Human Rights, Central Law Publications, (2008)

Reference Books:

21. H.M. Seervai, Constitutional Law of India, Tripathi Publications, (1993).
22. S.K. Kapur, Human Rights under International Law and Indian Law, Central Law Agency, (2001)
23. NeelimaChandiramani, The Law of Contract: An Outline, 2nd Edn. Avinash Publications Mum, (2000)
24. Avtarsingh, Law of Contract, Eastern Book Co., (2002).
25. Anson W.R.(1979), Law of Contract, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verbenmituntrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

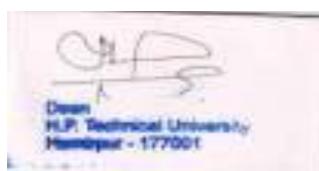
Wichtige Sprachhandlungen: Kleidung, Farben, Materialien.

Grammatik: formelle Imperativsätze mit "Sie" informelle Imperativsätze Vorschläge mit "wir" – "sollen/wollen wir" - Sollich? Modalpartikeln "doch" "mal" "doch mal".

UNIT - III

Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ "alle", "man" Indefinitepronomen "etwas", "nichts".



UNIT - IV

WichtigeSprachhandlungen: Essen und TrinkenimRestaurant,Partyvorbereitung und Feier.

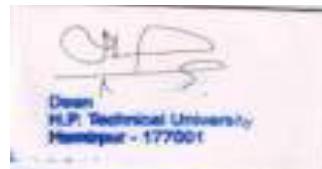
Grammatik: NomenausAdjektivennach “etwas”und “nichts” NomenausdemInfinitiv von Verben, zusammegesetzteNomen und ihreArtikel. AdjektiveimNom.undAkk.nachunbestimmtenArtikel, Negativartikel und Possessivartikel.

TEXT BOOK

5. Studio d A1. Deutsch alsFremdsprache with CD.(KursbuchundSprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

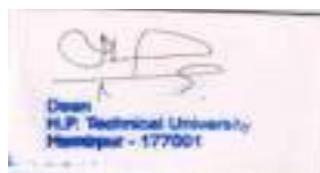
Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.



UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.

UNIT - IV

Grammar and Vocabulary – the verbs: manger, boire, the partitive articles

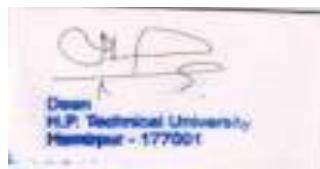
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading – reading a text.

TEXT BOOK

5. Tech French

REFERENCES

1. French for Dummies.
2. French made easy: Goyal publishers.
3. Panorama.



EE-411: ELECTRICALMACHINES-II LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

LIST OF EXPERIMENTS:

INDUCTION MOTORS

1. To perform no load test & block rotortest on three-phases squirrel cage induction motor.
2. To perform no load test & block rotortest on three-phases slip ring induction motor.
3. To study the starting methods of three-phase induction motors.
4. To study the cascading of two induction motors.
5. To conduct the load test to determine the performance characteristics of the induction motor.
6. To study speed changing by pole changing method.

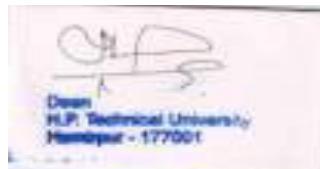
SYNCHRONOUS MACHINES

1. To draw characteristics of alternator under different loading condition.
2. To find out regulation by synchronous impedance method.
3. To find out regulation by ZPF method.
4. To draw characteristics of alternator under different loading condition.
5. To plot V-Curves of a synchronous motor.
6. To measure steady state reactances (X_d, X_q) of a synchronous machine.

NOTE: At least eight experiments are to be performed in the semester from the above list.

Recommended Books:

“Experimentation and vivavoce on electrical machines” by V.N. Mittal & A. Mittal, Standard Publications



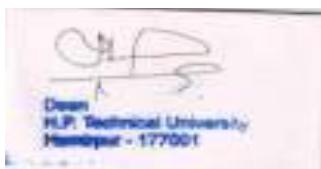
EE-412 ELECTRICAL MEASUREMENTS AND MEASURING INSTRUMENTS LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

LIST OF EXPERIMENTS

1. To identify meters from the given lot.
2. To calibrate an energy meter with the help of a standard wattmeter & a stopwatch.
3. To measure power & power factor by 3-Ammeter method.
4. To measure power & power factor by 3-Voltmeter method.
5. To measure power & power factor in 3-phase circuit by 2-Wattmeter method.
6. To measure capacitance by De Sauty's bridge.
7. To measure inductance by Maxwell's bridge.
8. To measure frequency by Wein's bridge.
9. To measure the power with the help of C.T & P.T.
10. To measure low resistance by Kelvin's double bridge.

Note: At least eight experiments to be performed from above list



EE-413:- Electrical Simulation Lab-1

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	3	2	30	20	50	3 hrs

List of Experiments

Software to be used: SimPower Systems (MATLAB Simulink)

1. At least eight computer simulation based electrical models to be studied on SimPower Systems.
2. To verify Kirchhoff's Current and Voltage laws in ac circuit.
3. To verify Superposition and Maximum-Power transfer theorem for a linear electrical system.
4. To study voltage and current relations in a balanced three-phase electrical system for star and delta Load.
5. To simulate no-load and open circuit tests of a two-winding transformer.
6. To simulate speed-torque characteristics of a dc shunt motor
7. To simulate variation of power factor and efficiency of a 3-phase induction motor with load.
8. To simulate ABCD constants of a transmission line.
9. To simulate performance of a long line at various loading conditions.
10. To study the dynamic characteristics of an SCR.
11. To simulate string efficiency of series and parallel connected SCRs.



H. DETAILED SYLLABI OF COURSES

SCHEME OF TEACHING AND EXAMINATION B.TECH MECHANICAL ENGINEERING										
SEMESTER – III										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	ME-301	Strength of Materials-I	3	1	0	4	40	60	100
4	PC	ME-302	Fluid Mechanics	3	1	0	4	40	60	100
5	PC	ME-303	Engineering Thermodynamics	3	0	0	3	40	60	100
6	PC	ME-304	Machine Drawing	2	0	3	3	40	60	100
7	OE	-	Open Elective-I	2	0	0	2	40	60	100
Labs:										
1	PC	ME-305	Strength of Materials Lab	0	0	2	1	30	20	50
2	PC	ME-306	Fluid Mechanics Lab	0	0	2	1	30	20	50
3	MC	ME-307	Computer Aided Design(CAD) Lab-I	0	0	3	2	30	20	50
			Total	16	4	10	24+2			

OPEN ELECTIVE – I										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS-306	Sociology & Elements of Indian History for Engineers	2	0	0	2	40	60	100
2	OE	HS-307	German Language - I	2	0	0	2	40	60	100
3	OE	HS-308	French Language - I	2	0	0	2	40	60	100



SCHEME OF TEACHING AND EXAMINATION
B.TECH MECHANICAL ENGINEERING

SEMESTER – IV

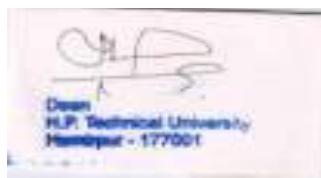
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Human Values and Professional Ethics	2	2	0	3	40	60	100
3	PC	ME-401	Manufacturing Technology-I	3	0	0	3	40	60	100
4	PC	ME-402	Strength of Material-II	3	1	0	4	40	60	100
5	PC	ME-403	I.C Engines	3	0	0	3	40	60	100
6	PC	ME-404	Turbo Machines	3	1	0	4	40	60	100
7	OE	-	Open Elective-II	2	0	0	2	40	60	100

Labs:

1	PC	ME-405	I.C. Engine Lab	0	0	2	1	30	20	50
2	PC	ME-406	Turbo Machines Lab	0	0	2	1	30	20	50
3	MC	ME-407	Manufacturing Practice Lab-I	0	0	3	2	30	20	50
			Total	16	6	7	24+2			

OPEN ELECTIVE – II

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS-410	Law for Engineers	2	0	0	2	40	60	100
2	OE	HS-411	German Language – II	2	0	0	2	40	60	100
3	OE	HS-412	French Language – II	2	0	0	2	40	60	100



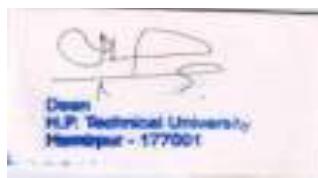
SCHEME OF TEACHING AND EXAMINATION
B.TECH MECHANICAL ENGINEERING

SEMESTER – V

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PC	ME-501	Kinematics of Machines	2	2	0	3	40	60	100
2	PC	ME-502	Manufacturing Technology-II	3	0	0	3	40	60	100
3	PC	ME-503	Heat Transfer	3	1	0	4	40	60	100
4	PC	ME-504	Machine Design-I	3	1	0	4	40	60	100
5	PC	ME-505	Computer Aided Design	2	2	0	3	40	60	100
6	PC	ME-506	Materials Technology	3	0	0	3	40	60	100
7	OE	-	Open Elective-III	2	0	0	2	40	60	100
Labs:										
1	MC	ME-507	CAD Lab-II	0	0	3	2	30	20	50
2	PC	ME-508	Manufacturing Practice Lab-II	0	0	2	1	30	20	50
3	PC	ME-509	Heat Transfer Lab	0	0	2	1	30	20	50
			Total	16	6	7	24			

OPEN ELECTIVE – III

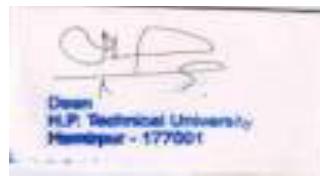
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	ME-510	Robotics	2	0	0	2	40	60	100
2	OE	ME-511	Automobile Technology	2	0	0	2	40	60	100
3	OE	ME-512	Rural Technology & Community Development	2	0	0	2	40	60	100



SCHEME OF TEACHING AND EXAMINATION B.TECH MECHANICAL ENGINEERING										
SEMESTER – VI										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	ME-601	Computer Aided Manufacturing (CAM)	3	1	0	4	40	60	100
2	PC	ME-602	Measurement and Control	3	0	0	3	40	60	100
3	PC	ME-603	Machine Design-II	3	1	0	4	40	60	100
4	PC	ME-604	Operation research	2	2	0	3	40	60	100
5	PC	ME-605	Thermal Engineering	2	2	0	3	40	60	100
6.	PC	ME-606	Dynamics of Machinery	3	0	0	3	40	60	100
7	PE	-	Programme Elective-I	3	0	0	3	40	60	100
Labs:										
1	PC	ME-607	Computer Aided Manufacturing (CAM)	0	0	2	1	30	20	50
2	PC	ME-608	Theory of Machine Lab	0	0	2	1	30	20	50
3	MC	ME-609	Seminar	0	0	3	2	30	20	50
			Total	16	6	6	24			

PROGRAM ELECTIVE –I										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	ME-610	Modern Manufacturing processes	3	0	0	3	40	60	100
2	PE	ME-611	Maintenance and Reliability	3	0	0	3	40	60	100
3	PE	ME-612	Composite Materials	3	0	0	3	40	60	100

Industrial /Practical Training after VI Semester of six weeks duration



**SCHEME OF TEACHING AND EXAMINATION
B.TECH MECHANICAL ENGINEERING**

SEMESTER – VII

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	ME-701	Industrial automation and Robotics	3	0	0	3	40	60	100
2	PC	ME-702	Refrigeration & Air Conditioning	3	1	0	4	40	60	100
3	PC	ME-703	Power Plant Engineering	3	0	0	3	40	60	100
4	PC	ME-704	Industrial Engineering & Production Management	2	2	0	3	40	60	100
5	PE	-	Programme Elective-II	3	0	0	3	40	60	100
Labs:										
6	MC	ME-705	Project Work -I	0	0	4	2	30	20	50
7	MC	ME-706	Automation and Robotics Lab	0	0	3	2	30	20	50
8	PC	ME-707	Thermal Engineering Lab	0	0	2	1	30	20	50
9	PC	ME-708	Industrial /Practical Training(Viva-Voce)	0	0	4	2	30	20	50
			Total	11	3	13	20			

PROGRAM ELECTIVE –II

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PE	ME-709	Material handling and Plant layout	3	0	0	3	40	60	100
2	PE	ME-710	Industrial Tribology	3	0	0	3	40	60	100
3	PE	ME-711	Automobile Engineering	3	0	0	3	40	60	100



SCHEME OF TEACHING AND EXAMINATION
B.TECH MECHANICAL ENGINEERING

SEMESTER – VIII

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PE		Programme Elective - III	3	0	0	3	40	60	100
2	PE		Programme Elective - IV	3	0	0	3	40	60	100
3	MC	ME-807	Project Work - II	0	0	16	8	40	60	100
			Total	6	0	16	14			
OR										
4	MC	ME-808	Industrial Project	0	0	16	8	40	60	100
			Total	0	0	24	8			

PROGRAM ELECTIVE –III

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	ME-801	Industrial Robotics	3	0	0	3	40	60	100
2	PE	ME-802	Non-Conventional Energy resources	3	0	0	3	40	60	100
3	PE	ME-803	Production Planning and control	3	0	0	3	40	60	100

PROGRAM ELECTIVE –IV

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	ME-804	Mechatronics	3	0	0	3	40	60	100
2	PE	ME-805	Gas Dynamics	3	0	0	3	40	60	100
3	PE	ME-806	Vibrations	3	0	0	3	40	60	100

Note: Industrial Project of Four months duration is to be carried out by the student exclusively in industry under the joint supervision of faculty advisers from institution as well as from the industry.



SEMESTER-III



MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties - Function of Random variables.

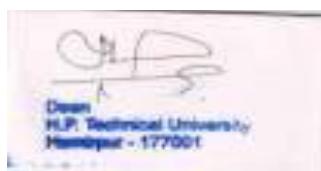
UNIT – III

Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

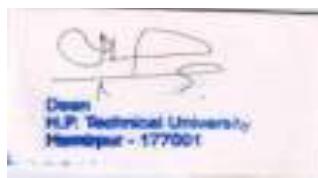


Text Books:

16. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
17. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
18. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers", 5th Edition, 2011.

Reference books:

16. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearson Education, Delhi, 2002.
17. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
18. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists" 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics - Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

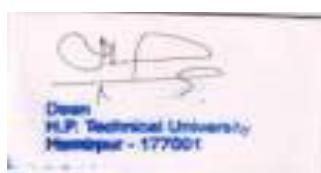
UNIT - II

Value Analysis - Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management, organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.



Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages,incentives, recruitment, training and industrial relations.

UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet,

break evenanalysis - basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketingenvironment, marketing mix, advertising and sales promotion.

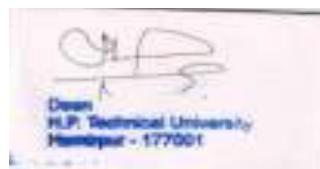
Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

Text Books:

11. PanneerSelvam, R, “*Engineering Economics*”, Prentice Hall of India Ltd, New Delhi.
12. Dwivedi, D.N., “*Managerial Economics, 7/E*”, Vikas Publishing House.

Reference Books:

51. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., “*Engg. Economy 15/E*”,Prentice Hall, New York, 2011.
52. Chan S. Park, “*Contemporary Engineering Economics*”, Prentice Hall of India, 2002.
53. F. Mazda, *Engg.Management*, Addison Wesley, Longman Ltd., 1998.
54. O. P. Khanna, *Industrial Engg.and Management*,DhanpatRai and Sons, Delhi, 2003.
55. P. Kotler, *Marketing Management, Analysis, Planning, Implementation and Control*,Prentice Hall, New Jersey, 2001.
56. VenkataRatnam C.S & Srivastva B.K, *Personnel Management and Human Resources*, Tata McGraw Hill.
57. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill.
58. Bhattacharya A.K., *Principles and Practice of Cost Accounting*, Wheeler Publishing.
59. Weist and Levy, *A Management guide to PERT and CPM*, Prantice Hall of India.
60. Koontz H.,O'Donnell C.,&Weihrich H, *Essentials of Management*, McGraw Hill.



ME-301: STRENGTH OF MATERIALS-I

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semesteter	Total	
3	1	0	4	40	60	10	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

UNIT-I

Simple Stresses and Strains: Stress & Strain, Types of stresses and strains, elastic limit, Hooke's law, Stress-Strain diagram for ductile and brittle, Factor of Safety, Poisson's ratio, Elastic constants, Young's Modulus, Shear Modulus, and Bulk Modulus, Relationship between elastic constants. Introduction to thermal stresses and strains.

Compound stresses & strains: Concept of surface and volumetric strains, two -dimensional stress system, complementary shear stresses at a point on a plane. Principal stresses & strains and principal planes. Mohr's circle of stresses, Numerical problems.

UNIT-II

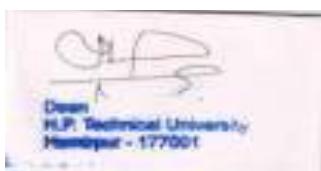
Bending Stresses in Beams: Bending stresses in Beams with derivation of Bending equation and its application to beams of circular, rectangular, I & T sections, Composite Beams.

Torsion of Circular Shaft: Theory of Pure Torsion, Derivation of Torsion equation for a circular shaft subjected to torsion, assumptions, derivation of maximum torque transmitted by a solid shaft, and hollow shaft.

UNIT-III

Shear and combined stresses in beams: Shear stresses in beams with derivation of shear stress in rectangular I, T, circular and hollow circular sections. Combined bending, torsion & axial loading of beams. Numerical problems.

Slope & Deflection: Relationship between bending moment, slope & deflection, Method of integration, Macaulay's method, Mohr's theorem-moment area method, .. Calculations for slope & deflection of (1) cantilevers and (2) simply supported beams with or without overhang, under concentrated loads, uniformly distributed loads, uniformly distributed loads, or combination of any two or all of these types of loads. Numerical problems.



UNIT-IV

Theories of Elastic Failure: Various theories of elastic failure with derivations and graphical representations, applications to problems of two-dimensional stress systems with (i) Combined direct loading and bending and (ii) combined torsional and direct loading. Numerical problems.

Strain Energy & Impact Loading: Definitions, expressions for strain energy stored in a body when load is applied (i) gradually, (ii) suddenly and (iii) with impact. Strain energy of beams in bending, beam deflections. Strain energy of shafts in twisting. Energy methods in determining spring deflection, Castiglano's & Maxwell's theorems, Numerical problems.

Textbooks :

1. Mechanics of Materials-Vol.-1, & Vol. 2, E.J. Hearn, Elsevier Publications.
2. Strengths of Materials – R.K. Rajput, S.Chand & Sons.
3. Strength of Materials- R.K. Bansal, Laxmi Publications.

Reference Books:

1. Mechanics of Materials-R.C.Hibbeler, Pearson India.
2. Mechanics of Solids-James Goodno, Thomson Publishers.
3. Strength of Materials-Popov , PHI, New Delhi.
4. Strength of Materials-G.H. Ryder- Third Edition in S.I. units 1969 Macmillan India.



ME 302: FLUID MECHANICS

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semester	Total	
3	1	0	4	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

UNIT-I

Introduction: Fluid Definition and properties, Newton's law of viscosity concept of continuum, Classification of fluids

Fluid Statics: Definition of body and surface forces, Pascal's law, Basic hydrostatic equation, Forces on surfaces due to hydrostatic pressure, Buoyancy and Archimedes' principle, Metacenter, stability of floating and submerged bodies

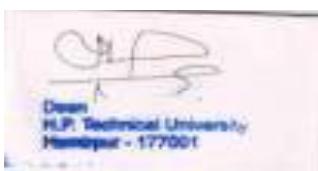
UNIT-II

Fluid Kinematics: Eulerian and Lagrangian approach to solutions; Velocity and acceleration in an Eulerian flow field; Definition of streamlines, path lines and streak lines; Definition of steady/unsteady, uniform/non-uniform, one-two and three dimensional flows; Definition of control volume and control surface, stream function, velocity potential function , irrotational flows; Definition and equations for source, sink, irrotational vortex, circulation

Fluid Dynamics I : Integral equations for the control volume: Reynold's Transport theorem, equations for conservation of mass, energy and momentum, Momentum and Energy correction factors, Bernoulli's equation and its application in flow measurement, mouth pieces , pitot tube, venture, orifice and nozzle meters.

UNIT-III

Fluid Dynamics II: Differential equations for the control volume: Mass conservation in 2 and 3 dimension in rectangular and cylindrical co-ordinates, Euler's equations in 2,3dimensions and subsequent derivation of Bernoulli's equation; Navier-Stokes equations, Couette flow, plane Poiseuille flow



Real fluid flows: Definition of Reynold's number, Laminar flow through a pipe (Hagen Poiseuille flow), velocity profile and head loss; Prandtl mixing length theory; velocity profiles for turbulent flows, Velocity profiles for smooth and rough pipes Darcy's equation for head loss in pipe, Moody's diagram, pipes in series and parallel, major and minor losses in pipes

UNIT-IV

Boundary Layer Flows: Concept of boundary layer and definition of boundary layer thickness, displacement, momentum and energy thickness; laminar and turbulent boundary layers, laminar sub-layer; Von Karman Momentum Integral equation for boundary layers, analysis of laminar and turbulent boundary layers, drag, boundary layer separation and methods to control it, streamlined and bluff bodies

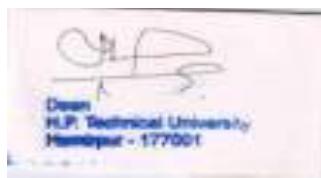
Dimensional analysis: Buckingham's Pi theorem, Non – dimensional numbers and their application, similitude, scale effects

Text Books:

1. Introduction to Fluid Mechanics and Machines, S. K Som , McGraw Hill
2. P.N.Modi and S.M.Seth (1999), Hydraulics and Fluid Mechanics including Hydraulic Machines, Standard Book House, Naisarak, Delhi

Reference Books:

1. Fluid Mechanics: F.M.White, McGraw Hill
2. Fluid Mechanics: Cengel and Cimbala
3. Fluid Mechanics and Fluid Power Engineering – D.S.Kumar, S.K.Kataria and Sons.
4. Mechanics of Fluids: Irving Shames



ME 303: ENGINEERING THERMODYNAMICS

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semester	Total	
3	0	0	3	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

UNIT-I

Introduction and Basic Concepts: Application areas of thermodynamics, Systems and Control volumes, Properties of system, Continuum, State and equilibrium, Processes and cycles, Temperature and Zeroth law of thermodynamics, Heat and thermodynamic, concept of work.

First Law of Thermodynamics: Statement, Heat and work calculations, Application of first law to non-flow and flow systems, steady flow energy equation as applied to boiler, condenser, throttle, nozzle and turbine

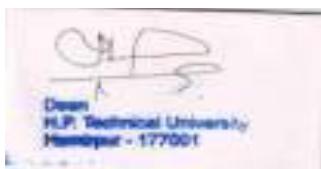
UNIT-II

Second Law of Thermodynamics: Statements and their equivalence, thermal energy reservoirs, concept of heat engine, refrigerator, heat pump and perpetual motion machines, Carnot cycle and principles.

Entropy: Concept of entropy, Temperature- entropy plot, Clausius inequality theorem, Principle of Increase of entropy, entropy balance, entropy generation in daily life, first and second law combined, entropy changes of an ideal gas during reversible processes, Available and unavailable energy, Irreversibility, second law efficiency

UNIT-III

Property Relations: Introduction to Maxwell relations, Clausius-Clapeyron equation, volume expansivity and isothermal compressibility, Mayer relation, Joule-Thomson coefficient.



Properties of Steam: Dryness fraction, enthalpy, internal energy and entropy, steam table, polynomial form of steam equations and Mollier chart, First law applied to steam processes

UNIT-IV

Power Cycles: Vapor power Cycles: Carnot vapour cycle, Rankine cycle, Ideal reheat Rankine cycle, Introduction to co-generation. **Gas Power Cycles:** Air standard assumptions, Otto cycle, Diesel cycle, dual cycle, Stirling cycle, Ericsson cycle, Brayton cycle

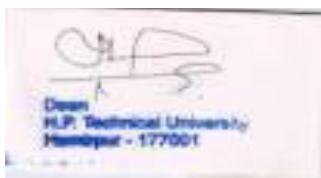
Reactive Systems: Combustion, theoretical and actual combustion processes, enthalpy of formation and enthalpy of combustion, adiabatic flame temperature, first law analysis of reactive system

Text Books

1. Thermodynamics by P K Nag, TMH, 5TH Edition
2. Fundamentals of Classical Thermodynamics by Van Wylen G.H. & Sonntag R.E., John Wiley & Sons.

Reference Books:

1. Thermodynamics: An Engineering Approach by Yunus A. Cengel and Michael A Boles, 7e, TMH.
2. Thermodynamics and Heat Engines by R Yadav, Central Publishing house.
3. Holman, J.P. Thermodynamics. McGraw- Hill
4. Thermal Engineering by Mahesh Rathod, McGrawHill Publications
5. Engineering Thermodynamics- A Generalized Approach by P L Dhar, ELSEVIER
6. Fundamentals of Thermodynamics by Moran & Shapiro.
7. Schaum's Outlines: Thermodynamics for Engineers by Merle C. Potter



ME 304: MACHINE DRAWING

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semester	Total	
2	0	3	3	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

UNIT-I

Introduction: Introduction to BIS Specification sp: 46- 1988 Code of engineering drawing – Limits. Fits and Tolerance (dimensional and Geometrical tolerance), Surface finish representation.

UNIT-II

Gear: Gear terminology. I.S convention of assembly of spur gears, helical gear, bevel gears, worm and worm wheel.

Fasteners: Drawings of various views of Screw threads, metric and BSW threads, Square thread and multi start threads. Nut bolts, Washers, Setscrew, Locknuts and foundation bolts.

UNIT-III

Orthographic view: Orthographic view from isometric views of machine parts / components. Dimensioning- Sectioning. Exercises on coupling, crankshaft, pulley, piston and connecting rod, cotter and knuckle joints. Riveted joints and Welded joints.

UNIT-IV

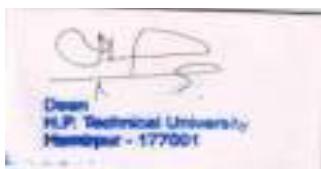
Assembly drawing: Assembly drawings with sectioning and bill of materials from given detail drawings of assemblies: Lathe tail stock, machine vice, pedestal bearing, Steam stop valve, drill jigs and milling fixture.

Text Books:

1. Machine Drawing: N D Bhat and V M Panchal, Pub: Charotar Publishing House.
2. A text book of machine drawing: PS Gill, Pub: S.K.Kataria& Sons.

Reference Books:

1. A text books of machine Drawing: Laxminarayana and Mathur, Pub: M/S Jain Brother. New Delhi.
2. Machine Drawing: N Sidheshwar, P Kannaieh, V S Sastry, Pub: Tata McGraw Hill.



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT- I

Introduction to sociological concepts - structure, system, organization, social institution, Culture social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT –II

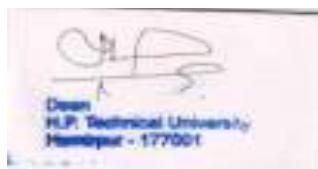
Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

UNIT –III

Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.



UNIT - IV

From feudalism to colonialism -the coming of British; Modernity and struggle for independence.

Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India 2ndphase (LPG decade post 1991)

Text Books:

16. Desai, A.R. (2005), Social Background of Indian Nationalism, Popular Prakashan.
17. Giddens, A (2009), Sociology, Polity, 6thEdition.
18. Chandoke, Neera& Praveen Priyadarshi(2009), contemporary India: Economy, Society and Politics, Pearson.

Reference Books:

21. Guha, Ramachandra(2007), India After Gandhi, Pan Macmillan.
22. Haralambos M, RM Heald, M Holborn (2000), Sociology, Collins.
23. Sharma R. S..(1965), Indian feudalism, Macmillan.
24. Gadgil, Madhab&RamchandraGuha(1999) - This Fissured Land: An Ecological Histry of India, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßige Verben im Präsens - “sein” und haben im Präsens - Personalpronomen im Nominativ.

UNIT- II

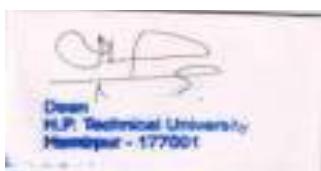
WichtigeSprachhandlungen: TelefonNummernverstehen und sprechen Uhrzeitenverstehen und sagen Verneinung “nicht und kein” (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notieren bestimmt und unbestimmter Artikel und Negativartikel im Nom. & Akkusativ

UNIT- III

WichtigeSprachhandlungen: Tageszeitenverstehen und überTermine sprechen- Verabredungen verstehen - Aufgaben im Haushalt verstehen

Grammatik: Personalpronomen im Akkusativ und Dativ - W-Fragen “wie, wer, wohin, wo, was usw.-Genitiv bei Personennamen - Modalverben im Präsens “können, müssen, möchten”



UNIT- IV

WichtigeSprachhandlungen:Sichaustauschen, was man kann, muss –BezeichnungenLebensmittel – Mengenangabenverstehen – PreiseverstehenundEinkaufzettelschreiben

Grammatik:Wortstellung in SätzenmitModalverben – Konnektor ”und” – “noch”-kein-----mehr – “wieviel, wieviele, wie alt, wie lange” –PossessivartikelimNominativ.

UNIT V

WichtigeSprachhandlungen:Freizeitanzeigenverstehen

HobbysandSportartenAnzeigenfürFreizeitpartnerschreibenbzw. daraufantworten –Vorlieben und Abneigungenausdrucken

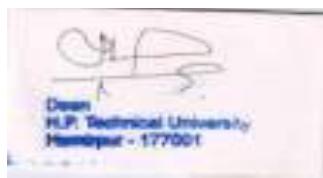
Grammatik:VerbenmitVokalwechselimPräsens – ModalverbenimPräsens“dürfen, wollen und mögen - “haben und sein” imPräteritum – regelmäßigeVerbenimPerfekt – Konnektoren “denn, oder, aber.

TEXT BOOK

1. Studio d A1. Deutsch alsFremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verbof self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the Frenchalphabet and the accents that play a vital role in the pronunciation of the words.

Writing:Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subjectpronouns.

Listening and Speaking: Pronunciation of words like Isabelle, presentezandla liaison – vousetes, vousappelez and role play of introducing each other –group activity.

Writing:Particulars in filling an enrolment / registration form.

Reading Comprehension: reading a text of a famous scientist and answeringquestions.

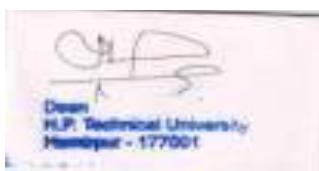
UNIT – III

Grammar and Vocabulary:Verb of possession “avoir’ and 1st group verbs“er”, possessive adjectives and pronouns of insistence- moi, lui..andnumbers from 0 to 20.

Listening and Speaking: Nasal sounds of the words like feminine, ceinture,parfum and how to ask simple questions on one’s name, age, nationality,address mail id and telephone number.

Writing:Conjugations of first group verbs and paragraph writing on self –introduction and introducing a third person.

Reading Comprehension: reading a text that speaks of one’s profile andanswering questions



UNIT – IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb “aimer” and seasons of the year and leisure activities.

Listening and Speaking: To express one’s likes and dislikes and to talk of one’s pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing: Conjugations of the irregular verbs: faire and savoir and their usage. Paragraph writing on one’s leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one’s way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs, a droite, la premiere a gauche and vocabulary relating to accommodation.

Listening and Speaking: To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing: Paragraph writing describing the accommodation using the different prepositions like en face de, derriere- to locate.

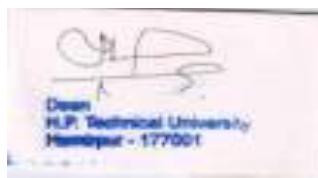
Reading Comprehension: A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliotheque?.....

TEXT BOOK

1. Tech French

REFERENCES

1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



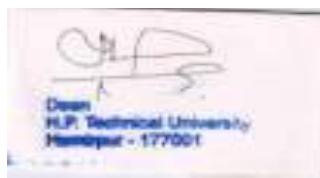
ME-305: STRENGTH OF MATERIALS – LAB.

Teaching Scheme			Credits	Marks			Duration Semester Examination	End
L	T	P/D	C	I.A.	ESE	Total		
0	0	2	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF EXPERIMENTS:

1. To study the Brinell and Rockwell hardness testing machine & compare hardness of atleast two types of materials/alloys,
2. To study the Vickers hardness testing machine & perform Vickers hardness test& compare hardness of atleast two types of materials/alloys,
3. To study the Impact Testing Machine and perform the Impact tests (Izod&Charpy),
4. To study the Universal testing machine and perform the tensile test for comparing graphs of atleast two types of materials/alloys,
5. To perform compression test on UTM,
6. To perform bending/shear test on UTM,
7. To perform the torsion test on mild steel/aluminium alloy,
8. To perform fatigue test on mild steel/aluminium alloy,
9. To find Young’s Modulus of a beam (rectangular/triangular/circular section) using deflection of beam apparatus,
10. To find Modulus of Rigidity of a specimen using Searl’s Apparatus



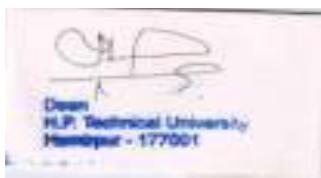
ME306: FLUID MECHANICS LAB

Teaching Scheme			Credits	Marks			Duration	End Semester
L	T	P/D	C	I.A.	ESE	Total		Examination
0	0	2	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

1. To determine the coefficient of impact for vanes.
2. To determine the coefficient of discharge of Notch (V and Rectangular types)
3. To determine the friction factor for the pipes.
4. To determine the coefficient of discharge of venturimeter /orifice meterpitot tube.
5. To determine the coefficient of discharge, contraction & velocity of an orifice.
6. To find critical Reynolds number for a pipe flow.
7. To study the effect of pressure surge in pipes.
8. To determine the minor losses due to sudden enlargement, sudden contraction and bends.
9. To show the velocity and pressure variation with radius in a forced vertex flow
10. To determine lift and drag of an aerofoil.
11. To determine the static pressure and dynamic pressure distribution around an aerofoil using wind tunnel apparatus
12. To determine the meta-centric height of a floating body
13. To perform the calibration of pressure gauge



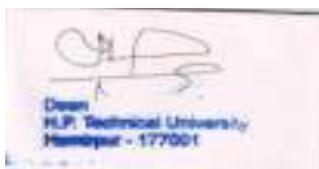
ME307: COMPUTER AIDED DESIGN (CAD) LAB-I

Teaching Scheme			Credits	Marks			Duration	End Semester Examination
L	T	P/D	C	I.A.	ESE	Total		
0	0	3	1	30	20	50	3 hrs	

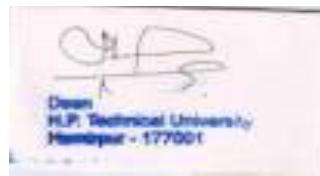
Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF EXPERIMENTS:

1. Setting up of drawing environment by setting drawing limits, drawing units, naming the drawing naming layers, setting line types for different layers using various type of lines in Engineering drawing, saving the file with dwg. extension.
2. Layout drawing of a building using different layer and line colors indicating all Building details name the details using text commands, Make a title Block.
3. To Draw Orthographic projection drawings (Front, Top and side) of boiler safety valve giving name the components of the valve.
4. Make an Isometric dimensioned drawing of a connecting Rod using Isometric grid and snap.
5. Draw quarter sectional isometric view of a cotter joint.
6. Draw different types of bolts and nuts with internal and external threading in Acme and square threading standards. Save the bolts and nuts as blocks suitable for insertion.
7. Draw a 3D model of a machine component using 3D primitives and using commands like Union, Subtraction, Revolve, Slice, Rotate 3D etc. Calculate surface Area, Mass, Centre of Gravity and Mass moment of inertia using inquiry commands render the figure made and attach a material to the figure.
8. Draw 3D model of protected type flange coupling.
9. Draw a spiral by extruding a circle.
10. Draw an assembly of Jigs & Fixture in 3D.



SEMESTER-IV



MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

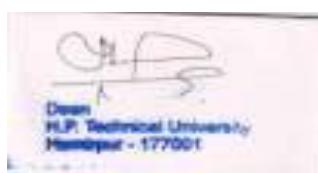
UNIT – II

Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.

UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.



Approximation methods for nonlinear programming: Line search methods, gradientmethods, conjugate gradient methods; Networkingtechniques – PERT and CPM.

UNIT - IV

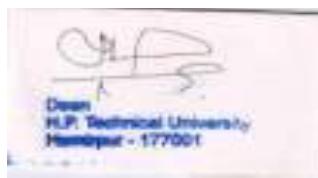
Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and it's role in minimization, minimization under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

21. C. B. Gupta, "Optimization Techniques in Operation Research," I. K. International Publishing House Pvt. Ltd.
22. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
23. Mukesh Kumar Singh, "Calculus Of Variations" Krishna Prakashan Media (P) Ltd.
24. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

26. I. M.Gelf and S. V. Fomin, "Calculus of Variations" Dover Publications IncMineola,New York.
27. Purna Chand Biswal, "Optimization in Engineering, Scitech Publications India Pvt. Ltd.
28. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
29. G. Hadly, Linear Programming, Narosa Publishing House.
30. KantiSwarup, P. K. Gupta and Manmohan, "Operations Research," Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

7. Understanding the need , basic guidelines, content and process of value Education
8. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

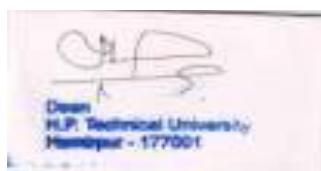
13. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
14. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
15. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
16. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

10. Understanding human being as a co-existence of the self and the body.
11. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
12. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

7. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
8. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.



UNIT V: Harmony in Family, Society and Nature

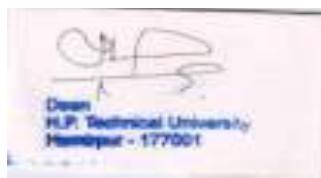
10. Understanding harmony in the family, society and nature.
11. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.
12. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

7. R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).
8. R R Gaur, R Sangal and G P Bagaria, Teacher's Manual (English), 2009.

Reference Books

19. E.F. Schumacher, Small is Beautiful; a study of economics as if people mattered, Blond & Briggs, Bratain, 1973.
20. PL Dhar, RR Gaur, Science and Humanism, common wealth publishers, 1990.
21. A.N. Tripathy, Human values, New Age International Publishers, 2003.
22. E.G. Seebauer& Robert, L BERRY, Foundational of Ethics for Scientists &Engineers, Oxford University Press, 2000.
23. M. Govindrajan, S.Natralan& V.S. Senthil Kumar, Engineering Ethics (including human Values), Eastern Economy Edition, Prentice hall of India Ltd.
24. B.L. Bajpai, 2004, Indian Ethos and Modern Management, New Royal book Co; Lucknow, 2004, Reprinted 2008.



Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semester	Total	
3	0	0	3	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks.

Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

UNIT-I

Introduction to Manufacturing and Manufacturing Processes, Classification of Manufacturing Processes, Metal Casting Processes: Introduction, Basic steps in Casting Processes, Advantage and limitations, sand mold making procedure, Patterns and Cores. Pattern materials, pattern allowances, types of pattern, colour coding, Moulding material, Moulding sand composition, and preparation, sand properties and testing type of sand moulds. Types of cores, core prints, chaplets, chills. Gating systems and Casting Defects, Gates and gating systems risers, melting practice, Cupola, charge calculations.

Casting cleaning and casting defects Fettling, defects in castings and their remedies, methods of testing of castings for their soundness. **Special Casting Processes:** Shell molding, precision investment casting, permanent mold casting, die casting, centrifugal casting, and continuous casting.

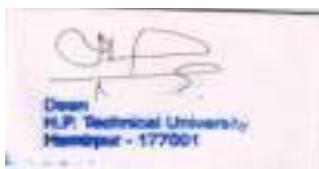
UNIT-II

Metal forming Processes: Introduction to Forming, Nature of plastic deformation, hot working and cold working. Principles of rolling roll passes roll pass sequences. Forging: Forging operations, smith forging, drop forging, press forging, forging defects.

Extrusion and other processes: Extrusion principle, hot extrusion, cold extrusion, wire drawing, swaging, tube making, **Sheet metal operation:** Press tool operations, shearing action, drawing dies, spinning, punching, piercing, bending, stretch forming, embossing and coining.

UNIT-III

Welding and Welding Defects: Introduction to Welding, Gas and Arc Welding, Classification: Oxyacetylene welding equipment and techniques. Electric arc welding: Electrodes, Tungsten inert gas



welding (TIG), metal inert gas welding (MIG), submerged arc welding (SAW), Resistance Welding: Principle & types, Welding Defects and Remedies.

Other Joining Processes: Thermit welding, electro slag welding, electron beam welding, forge welding, friction welding, diffusion welding, brazing and soldering and Mechanical joining,Joining Plastic

UNIT-IV

Plastic Manufacturing Processes Classification of plastic materials, Manufacturing of plastic products, casting, compression moulding, transfer moulding, Injection Moulding, Extrusion, calendering, blow moulding, forming shaping methods, laminating methods, reinforced plastic moulding.

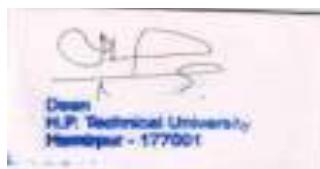
Powder Metallurgy: Introduction, Operation in powder metallurgy, Production of Metal powders, Properties of metal powder, Blending of metal powders, Compaction of metal powders, Sintering and secondary operation, Application of powder Metallurgy.

Text Books:

1. Materials and Manufacturing Processes—Kalpak Jain-Pearson Publication
2. Manufacturing Science – Ghosh A., Malik A.K. Affiliated East-West Press Pvt. Ltd., New Delhi.
3. Manufacturing Processes-J.P.Kaushish PHI Publication

Reference Books:

1. Production Technology: R.K.Jain, Khanna Publishers.
2. Manufacturing Technology: Vol I & Vol II, P.N.Rao, Tata McGraw Hill.
3. Manufacturing Technology: R.K. Rajput, Laxmi Publications.
4. Welding and Welding Technology: Richard L.Little, Tata McGraw Hill.
5. Principle of Metal casting- Rosenthal, Tata McGraw Hill.
6. Manufacturing Processes and Systems: Ostwald Phillip F., Munoz Jairo, John Wiley & Sons (Asia) Pvt. Ltd.



ME 402: STRENGTH OF MATERIALS-II

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D		Sessional	End Semester	Total	
3	1	0	4	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

Unit-I

Thin Walled Vessels: Derivation of Hoop & Longitudinal stresses & strains in cylindrical & spherical vessels under internal pressure. Change in volume of vessel under pressure, Numerical problems.

Thick Cylinders & Spheres: Derivation of equations for radial & hoop stresses and strains in thick cylinders and spherical shells. Compound cylinders and spherical shells subjected to internal fluid pressure only, hub shrunk on solid shaft. Wire-wound cylinders. Numerical problems.

Unit-II

Rotating Rims, Discs & Cylinders: Stresses and strains in (i) rotating rims, neglecting the effect of spokes, (ii) rotating discs, including disc of uniform strength and disc shrunk on hub (iii) rotating cylinders (solid & hollow). Numerical problems.

Unit-III

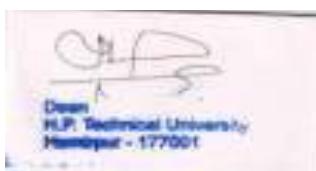
Columns & Struts: Columns under axial load, concept of instability and buckling, slenderness ratio. Derivation of Euler's formulae for the elastic buckling load. Euler's, Rankine Gordon's formulae, Johnson's empirical formula for axial loading of columns and their applications, eccentric compression of a short strut of rectangular & circular sections, Numerical problems.

Springs: Stresses in closed and open coiled helical springs subjected to axial loads and twisting couples. Leaf springs, flat spiral springs. Numerical Problems.

Unit-IV

Bending of Curved Bars: Stresses in bars of initial large radius of curvature, bars of initial small radius of curvature. Stresses in crane hooks, rings and chain links of circular & trapezoidal sections. Numerical Problems.

Unsymmetrical bending: Introduction to unsymmetrical bending, Shear Center, Numerical problems.



Textbooks :

1. Mechanics of Materials-Vol.-1, & Vol. 2, E.J. Hearn, Elsevier Publications.
2. Strengths of Materials – R.K. Rajput, S.Chand& Sons.
3. Strength of Materials- R.K. Bansal, Laxmi Publications.

Reference Books:

1. Mechanics of Materials-R.C.Hibbeler, Pearson India (9th Edition).
2. Mechanics of Solids-James Goodno, Thomson Publishers.
3. Strength of Materials-Popov , PHI, New Delhi.
4. Strength of Materials-G.H. Ryder- Third Edition in S.I. units 1969 Macmillan India.



ME 403: I.C.ENGINES

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semester	Total	
3	0	0	3	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

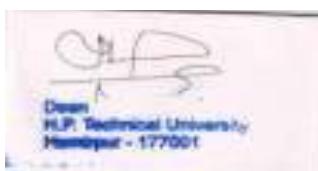
UNIT-I

Introduction Heat engines; Internal and external combustion engines; Classification of I.C. Engines; Cycle of operations in four strokes and two-stroke IC engines and their comparative study; Fuels: SI and CI engine fuels, Rating of fuels, Scavenging and scavenging blowers, Air standard cycles and Fuel air cycles, Variable specific heat and its effects, Dissociation and other losses, Actual cycles, Deviation of actual engine cycle from ideal cycle, TDC, BDC, Torque, Power.

Compression Ignition Engines Combustion phenomenon in C I engines, Stages of combustion, Delay period, Knocking, Pressure-Crank angle diagram, Factors affecting combustion and knocking, Types of combustion chambers. **Spark Ignition Engines** Combustion: Combustion phenomenon in SI Engines, Ignition delay, Flame propagation, Pressure-Crank angle diagram, Abnormal combustion, Auto ignition, Detonation and Knocking, Factors affecting combustion and detonation, Types of combustion chambers

UNIT-II

Fuel System – SI Engines: Theory of carburetion, Simple carburettor, Essential parts of modern carburettor, Types of carburettors, Types of fuel injection systems in SI engines, Continuous injection system, Timed injection system, Electronic Fuel Injection systems (EFIs)/MPFi, Working of Sensors, Functions of ECU in Petrol Engine. Spark Plug and its requirements, Battery, Magneto, Electronic ignition systems. GDI Technology, Turbo in Petrol Engines.



Fuel System – CI Engines: Fuel Injection Systems:Unit Pump, Inline Pump, Rotary Pump, Engine Governors: necessity and characteristics, Types of nozzle, Electronic Diesel Control, CRDi Technology, System Layout, Function of ECU in diesel engine, Working of Sensors, Turbocharger and its types, VGT, Twin-turbo.

UNIT-III

Engine lubrication: Types of lubricants and their properties, SAE rating of lubricants, Types of lubrication systems, **Engine Cooling:** Necessity of engine cooling, disadvantages of overcooling, Cooling systems and their comparison: Air cooling, Liquid cooling, **Supercharging/Turbo-charging:** Objectives, Effects on power output and engine efficiency

Engine Testing and Performance: Measurement of Break Horse Power, Indicated Power, Fuel Consumption, Air flow, BMEP, Performance characteristic of SI and CI Engines, Effect of load and Speed on mechanical, indicated thermal, break thermal and volumetric efficiencies, Heat balance sheet

UNIT-IV

After-treatment technologies: -Working of Catalytic Converter & its types, SCR, DPF, DOC, POC, LNT.**Exhaust Emissions:**Homologation, Emission Standards, Applicable Standards in India, Future Norms, and Significance of Fuel in meeting emissions. Classification of Segments, Emission Test Cycles, COP, Emission Measurement Techniques, On board Diagnosis, OBDI, OBDII.

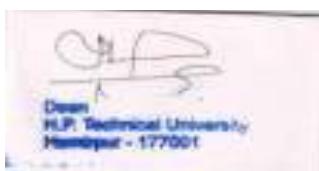
Alternate Fuels: Alcohol - Hydrogen - Natural Gas and Liquefied Petroleum Gas – Biodiesel- Biogas Properties - Suitability - Engine Modifications - Merits and Demerits as fuels.

Text Books

1. Ganesan V., (1999), Internal Combustion Engines, Tata McGraw Hill.
2. John B. Heywood, (2000), Internal Combustion Engine Fundamentals, McGraw Hill.

Reference Books

1. Rowland S.Benson and N.D.Whitehouse, (2000) Internal combustion Engines, Vol. I and II, Pergamon Press.
2. Colin R.Feriguson, and Allan.T.Kirkpatrick, (2000), I.C.engines Applied Thermosciences
3. Richard.L.Bechfold, Alternative Fuels Guide Book, SAEInternational Warrendale,1997.
4. “Alcohols as motor fuels progress in technology” - Series No.19 - SAE Publication USE - 1980.
- 5.Heisler Heinz, Advanced Engine Technology, Hodder & Stoughton Ltd



ME 404: TURBO MACHINES

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semester	Total	
3	1	0	3	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

UNIT-I

Impact of Jets and Water Turbines Impact of jet on flat and curved plates Types of hydro turbines - impulse and reaction, definition of various turbine parameters like gross head, discharge, work done, input power, output power, efficiencies etc., Euler's equation applied to a turbine, turbine velocities and velocity triangles, expression for work done.

Pelton Turbine: Components of Pelton turbine, definition of design parameters like speed ratio, jet ratio, and estimation of various parameters like head, discharge, and efficiency etc., determination of number of buckets, Performance Characteristic curves.

UNIT-II

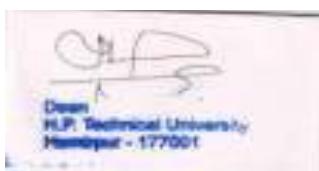
Reaction Turbines: Types of reaction turbines – Francis Turbine, Kaplan Turbine, inward and outward flow, radial mixed and axial; elements of the turbine, estimation of various working and design parameters, Performance Characteristic curves of reaction turbines

Similarity relations in turbines: definition of unit quantities and specific quantities, selection of turbines, Cavitation in turbines - causes, effects and remedies, Thomas cavitation parameter, specific speed graphs, Determination of safe height of installation for the turbine, Draft Tube, types of draft tube, governing of turbines.

UNIT-III

Centrifugal Pumps: Classification, velocity vector diagrams and work done, hydraulic and manometric efficiency, vane shape, head capacity relationship and pump losses, pressure rise impeller, minimum starting speed, multi-stage pumps, Similarity relations and specific speed, net positive suction head, cavitation and maximum suction lift, performance characteristics.

Reciprocating Pumps: Construction and operational details, discharge coefficient, volumetric efficiency and slip, work and power input, effect of acceleration and friction on



indicator diagram (pressure – stroke length plot) air vessels and their utility. Centrifugal v/s reciprocating pumps.

UNIT-IV

Centrifugal fans - Blowers and Compressors - construction details - Inducers – Backward and Radial blades - Diffuser - volute casing stage work - Stage pressure rise – Stage pressure co-efficient - Stage efficiency - Degree of reaction - Various slip factors H-S diagram for centrifugal compressor.

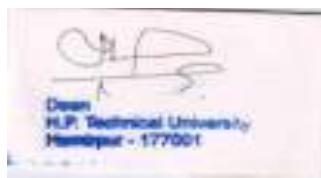
Axial flow Fans and Compressors –Construction detail - Stage velocity triangles - Blade loading and flow coefficient - Static pressure rise - H-S diagram - Degree of reaction - Work done factors -Free and Forced Vortex flow performance - Stalling and Surging

Text Books:

1. Fluid Mechanics and Fluid Power Engineering – D.S.Kumar, S.K.Kataria and Sons.
2. Fluid Mechanics and Hydraulic Machinery, Modi and Seth, Standard Book House

Reference Books

1. Turbines, Compressors & Fans, S M Yahya, TMH
2. Thermal Engineering, R K. Rajput, Laxmi Publication
3. Steam and gas turbine, R Yadav
4. Hydraulic Machinery, JagdishLal



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - Golak Nath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

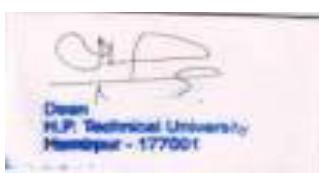
UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.

UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial



review of administrative actions, exclusion of judicial review and concept of “Ombudsman”; Right to Information Act, 2005 (Sub Section 1 - 20)

Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

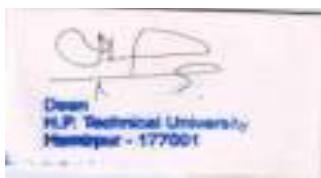
Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

16. D.D. Basu, Shorter Constitution of India, Prentice Hall of India, (1996)
17. MeenaRao, Fundamental concepts in Law of Contract, 3rd Edn. Professional Offset, (2006)
18. H.O.Agarwal, International Law and Human Rights, Central Law Publications, (2008)

Reference Books:

26. H.M. Seervai, Constitutional Law of India, Tripathi Publications, (1993).
27. S.K. Kapur, Human Rights under International Law and Indian Law, Central Law Agency, (2001)
28. NeelimaChandiramani, The Law of Contract: An Outline, 2nd Edn. Avinash Publications Mum, (2000)
29. Avtarsingh, Law of Contract, Eastern Book Co., (2002).
30. Anson W.R.(1979), Law of Contract, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verbenmituntrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

Wichtige Sprachhandlungen: Kleidung, Farben, Materialien.

Grammatik: formelle Imperativsätze mit "Sie" informelle Imperativsätze Vorschläge mit "wir" – "sollen/wollen wir" - Sollich? Modalpartikeln "doch" "mal" "doch mal".

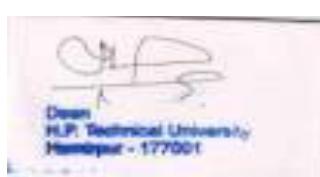
UNIT - III

Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ "alle", "man" Indefinitepronomen "etwas", "nichts".

UNIT - IV

Wichtige Sprachhandlungen: Essen und Trinken im Restaurant, Partyvorbereitung und Feier.



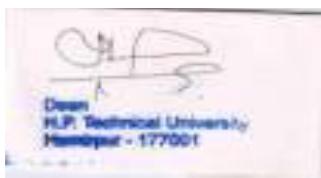
Grammatik: Nomen aus Adjektiven nach "etwas" und "nichts" Nomen aus dem Infinitiv von Verben, zusammengesetzte Nomen und ihre Artikel. Adjektive im Nom. und Akk. nach unbestimmten Artikel, Negativartikel und Possessivartikel.

TEXT BOOK

6. Studio d A1. Deutsch als Fremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

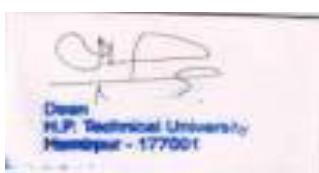
Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.

UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.



UNIT - IV

Grammar and Vocabulary –the verbs: manger, boire, the partitive articles

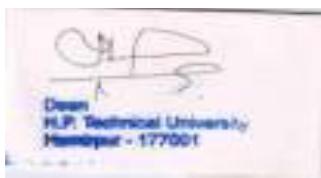
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading –reading a text.

TEXT BOOK

6. Tech French

REFERENCES

1. French for Dummies.
2. French made easy: Goyal publishers.
3. Panorama.



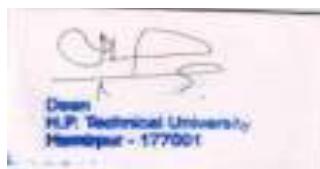
ME-405: I.C. ENGINE LAB

Teaching Scheme			Credits	Marks			Duration	End Semester
L	T	P/D	C	I.A.	ESE	Total	Examination	
0	0	2	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

1. To study the construction details of 2 Stroke and 4 Stroke Engines.
2. To study the valve timing diagram of engine. (4 stroke petrol/diesel engine)
3. To perform Morse Test on engine(4 stroke petrol/diesel engine)
4. To perform Speed Test on engine (4 stroke petrol/diesel engine)
5. To perform Load Test(Rope Brake/Eddy Current/hydraulic dynamometer) on engine (4 stroke petrol/diesel engine)
6. To perform Heat Balance test on engine (4 stroke petrol/diesel engine)
7. To perform experimental determination of Air fuel ratio and volumetric efficiency of the engine (4 stroke petrol/diesel engine)
8. To study the effects of Supercharging/turbo charging on Performance Characteristics of an engine (4 stroke petrol/diesel engine)
10. To study the difference between Carburettors based fuel system & EFI.
11. To study the difference between Inline Pump, Rotary Pump &CRDi System for a four cylinder diesel engine.
11. To study the effect of Injection Timing & Pressure on Single Cylinder Diesel Engine using Open ECU & perform Exhaust Gas/Smoke analysis of engine.
12. To study the effect of Spark Timing & Lambda on Single Cylinder Petrol Engine using Open ECU & perform Exhaust Gas/Smoke analysis of engine.
13. To study the construction details of Ignition system (Battery, Magneto, Electronic).



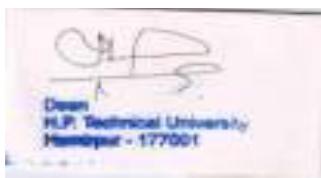
ME406: TURBO MACHINES LAB

Teaching Scheme			Credits	Marks			Duration End Semester
L	T	P/D	C	I.A.	ESE	Total	Examination
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF EXPERIMENTS:

1. To study the constructional details of a Pelton turbine and draw its fluid flow circuit.
2. To draw the performance characteristics of Pelton turbine constant head, constant speed and constant efficiency.
3. To study the constructional details of a Francis turbine and draw its fluid flow circuit.
4. To draw the constant head, constant speed and constant efficiency performance characteristics of Francis turbine.
5. To study the constructional details of a Kaplan turbine and draw its fluid flow circuit.
6. To draw the constant head, speed and efficiency curves for a Kaplan turbine.
7. To study the constructional details of a Centrifugal Pump (rated variable speed) and draw its characteristic curves.
8. To study the constructional details of a Reciprocating Pump and draw its characteristic curves.
9. To study the constructional details of a Hydraulic Ram and determine its various efficiencies.
10. To study the constructional details of a Centrifugal compressor.
11. To study the constructional details of a submersible Pump and draw its characteristic curves.

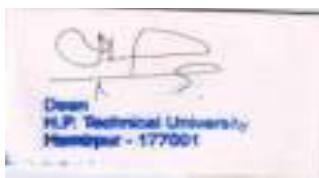


Teaching Scheme			Credits	Marks			Duration	End
L	T	P/D	C	I.A.	ESE	Total	Semester	Examination
0	0	3	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF EXPERIMENTS:

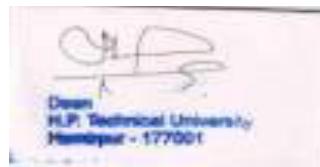
1. To make a pattern for a given casting with all the necessary allowances, parting line, running system details. Prepare the mould and make the casting. Investigate the casting defects and suggest the remedial measures.
2. To prepare the Aluminium Metal Matrix Composites using permanent mould casting and study the physical, mechanical characteristics and microstructure using metallurgical Microscope.
3. To prepare the Aluminium Metal Matrix Composites using centrifugal casting and study the physical, mechanical characteristics and microstructure using metallurgical Microscope.
4. To study design for welding and make a component involving horizontal and vertical welding and study the welding defects and suggests their remedies.
5. To make a component involving horizontal /vertical welding and determine the weld quality using destructive testing such as tension test/ bend test/fracture toughness test.
6. To make a component involving horizontal and vertical welding and determine the weld quality using Non-destructive testing such as liquid-penetrant/Ultrasonic testing/magnetic particles/radiographic tests.
7. To study design for brazing, soldering and perform the soldering and brazing operations of metals.
8. To perform the MIG/TIG operation on metals and determining the strength of weld using UTM.
9. To study design for mechanical fastening and perform joining of sheet metal by riveting.
10. Development and manufacturing of complex sheet metal components such as funnel etc.
11. To prepare the plastic composites using hand layup technique and study of physical, mechanical characteristics and microstructure.



I. DETAILED SYLLABI OF COURSES

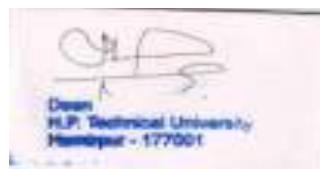
SCHEME OF TEACHING AND EXAMINATION B.TECH TEXTILE ENGINEERING										
SEMESTER – III										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	TE - 301	Textile Machines and Processes	2	2	0	3	40	60	100
4	PC	TE - 302	Natural Fibre	3	0	0	3	40	60	100
5	PC	TE - 303	Yarn Manufacture-I	2	2	0	3	40	60	100
6	PC	TE - 304	Fabric Manufacture-I	3	2	0	4	40	60	100
7	OE	-	Open Elective-I	2	0	0	2	40	60	100
Labs:										
1	PC	TE – 305	Introduction to Textile Engineering Laboratory	0	0	2	1	30	20	50
2	PC	TE – 306	Textile Fibre Laboratory	0	0	2	1	30	20	50
3	PC	TE – 307	Yarn Manufacture-I Laboratory	0	0	2	1	30	20	50
4	PC	TE – 308	Fabric Manufacture-I Laboratory	0	0	2	1	30	20	50
			Total	16	6	8	23+2			

OPEN ELECTIVE – I				Teaching Hours Per Week			Credits	Examination		
S. N.	Cat.	Subject Code	Title	L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS-306	Sociology & Elements of Indian History for Engineers	2	0	0	2	40	60	100
2	OE	HS-307	German Language - I	2	0	0	2	40	60	100
3	OE	HS-308	French Language - I	2	0	0	2	40	60	100



SCHEME OF TEACHING AND EXAMINATION B.TECH TEXTILE ENGINEERING										
SEMESTER – IV										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credit s	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Human Values and Professional Ethics	2	2	0	3	40	60	100
3	PC	TE - 401	Man Made Fibre	2	2	0	3	40	60	100
4	PC	TE - 402	Textile Chemical Processing-I	3	0	0	3	40	60	100
5	PC	TE - 403	Yarn Manufacture-II	2	2	0	3	40	60	100
6	PC	TE - 404	Fabric Manufacture-II	3	0	0	3	40	60	100
7	OE	-	Open Elective-II	2	0	0	2	40	60	100
Labs:										
1	PC	TE-405	Textile Chemical Processing- I Laboratory	0	0	2	1	30	20	50
2	PC	TE -406	Yarn Manufacture-II Laboratory	0	0	2	1	30	20	50
3	PC	TE -407	Fabric Manufacture-II Laboratory	0	0	2	1	30	20	50
4	MC	MC- 401	Oral and Written Communication Skills Laboratory -II	0	0	2	1	30	20	50
5	MC	TE -408	Extra-curricular activity(viva-voice)	0	0	2	1	30	20	50
			Total	14	8	10	23+2			

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS-410	Law for Engineers	2	0	0	2	40	60	100
2	OE	HS-411	German Language - II	2	0	0	2	40	60	100
3	OE	HS-412	French Language - II	2	0	0	2	40	60	100

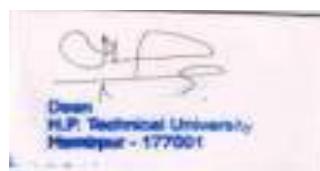


SCHEME OF TEACHING AND EXAMINATION B.TECH TEXTILE ENGINEERING										
SEMESTER – V										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Cred its	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PC	TE - 501	Theory of Textile Machines	3	2	0	4	40	60	100
2	PC	TE - 502	Textile Testing-I	3	0	0	3	40	60	100
3	PC	TE - 503	Textile Chemical Processing-II	3	0	0	3	40	60	100
4	PC	TE - 504	Non-Conventional Yarn Manufacture	3	0	0	3	40	60	100
5	PC	TE - 505	Non-Conventional Fabric Manufacture	3	0	0	3	40	60	100
6	PC	TE -506	Properties of Fibre	3	0	0	3	40	60	100
7	OE	-	Open Elective-III	2	0	0	2	40	60	100
Labs:										
1	PC	TE -507	Textile Testing-I Laboratory	0	0	2	1	30	20	50
2	PC	TE-508	Textile Chemical Processing-II Laboratory	0	0	2	1	30	20	50
3	PC	TE-509	Non-Conventional Yarn Manufacture Laboratory	0	0	2	1	30	20	50
4	PC	TE- 510	Non-Conventional Fabric Manufacture Laboratory	0	0	2	1	30	20	50
5	MC	TE -511	Community Project	0	0	2	1	30	20	50
6	MC	TE-512	Special Module in Textile Engineering	0	2	0	1	30	20	50
			Total	18	4	10	25			

OPEN ELECTIVE – III (For Students of Other Departments)

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE		Operating Systems	2	0	0	2	40	60	100
2	OE		Numerical Methods	2	0	0	2	40	60	100
3	OE		Rural Technology & Community Development	2	0	0	2	40	60	100
4	OE	TE- 513	Fashion Designing	2	0	0	2	40	60	100

Note: The course (Special Module in Textile Engineering) aims at introducing new or highly specialized technological aspects in Textile Engineering. The course topic and content is likely to change with each offering depending upon the current requirement and expertise available with the department including that of the visiting professionals.



SCHEME OF TEACHING AND EXAMINATION
B.TECH TEXTILE ENGINEERING

SEMESTER – VI

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	TE – 601	Textile Testing-II	3	0	0	3	40	60	100
2	PC	TE – 602	Textile Design and Analysis	3	0	0	3	40	60	100
3	PC	TE – 603	Garment Technology	3	0	0	3	40	60	100
4	PC	TE – 604	Non-Woven Technology	3	0	0	3	40	60	100
5	PC	TE – 605	Theory of Textile Structure	3	2	0	4	40	60	100
6.	PC	TE - 606	Mechanics of Textile Process	3	2	0	4	40	60	100
7	PE	-	Program Elective-I	3	0	0	3	40	60	100
Labs:										
1	PC	TE -608	Textile Testing-II Laboratory	0	0	2	1	30	20	50
3	PC	TE –609	Textile Design and Analysis Laboratory	0	0	2	1	30	20	50
4	PC	TE- 610	Garment Technology Laboratory	0	0	2	1	30	20	50
5	MC	TE- 611	Technical Seminar	0	0	2	1	30	20	50
			Total	18	4	8	24			

PROGRAM ELECTIVE – I

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	TE- 607(A)	Post Spinning Operation	3	0	0	3	40	60	100
2	PE	TE –607(B)	Process and Quality Control in Spinning & Weaving	3	0	0	3	40	60	100
3	PE	TE –607(C)	Apparel Marketing & Merchandising	3	0	0	3	40	60	100
4	PE	TE 607(D)	Woolen Technology	3	0	0	3	40	60	100
5	PE	TE-607 (E)	Advanced Fabric Structure and Design	3	0	0	3	40	60	100
6	PE	TE-607 (F)	Advances in Chemical Processing	3	0	0	3	40	60	100

Note:

1. *Technical Seminar: In the beginning of the semester, every student of the class will be assigned a seminar topic in the emerging / perspective field in the area of textiles such as Spinning, Weaving, Fibres, Testing, Chemical processing and alike. Seminar should be based on the literature survey on any topic of textiles.*
2. *Industrial /Practical Training after VI Semester of six weeks duration*



SCHEME OF TEACHING AND EXAMINATION
B.TECH TEXTILE ENGINEERING

SEMESTER – VII

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	TE - 701	Knitting Technology	3	0	0	3	40	60	100
2	PC	TE -702	Technical Textile	3	0	0	3	40	60	100
3	PC	TE -703	Mill Management and Maintenance	2	2	0	3	40	60	100
4	PC	TE -704	Statistics and Quality Control for Textile Industry	3	2	0	4	40	60	100
4	PE	-	Program Elective-II	3	0	0	3	40	60	100
Labs:										
6	PC	TE - 706	Knitting Technology Laboratory	0	0	2	1	30	20	50
7	MC	TE - 707	Industrial /Practical Training(Viva-Voce)	0	0	4	2	30	20	50
8	MC	TE - 708	Project Work -I	0	0	4	2	30	20	50
	MC	TE - 709	Special Module in Textile Engineering	1	2	0	2	30	20	50
9	MC	TE - 710	Technical Seminar	0	0	2	1	30	20	50
			Total	12	6	12	21			

PROGRAM ELECTIVE – II

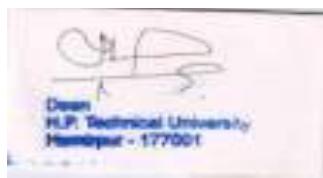
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PE	TE – 705(A)	Process and Quality Control in Apparel Manufacture	3	0	0	3	40	60	100
2	PE	TE – 705(B)	Functional Finishes	3	0	0	3	40	60	100
3	PE	TE – 705(C)	Processing of Man Made Fibres and Blended Textiles	3	0	0	3	40	60	100
4	PE	TE – 705(D)	Fashion Art and Design	3	0	0	3	40	60	100
5	PE	TE – 705(E)	Textured Yarn Technology	3	0	0	3	40	60	100

Note:

1. The course (**Special Module in Textile Engineering**) aims at introducing new or highly specialized technological aspects in Textile Engineering. The course topic and content is likely to change with each offering depending upon the current requirement and expertise available with the department including that of the visiting professionals



2. **Technical Seminar:** In the beginning of the semester, every student of the class will be assigned a seminar topic in the emerging / perspective field in the area of textiles such as Spinning, Weaving, Fibres, Testing, Chemical processing and alike. Seminar should be based on the literature survey on any topic of textiles.



SCHEME OF TEACHING AND EXAMINATION B.TECH TEXTILE ENGINEERING										
SEMESTER – VIII										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	MC	TE – 803(A)	Project Work - II	0	0	16	8	40	60	100
			Total	6	2	16	8			
OR										
2	MC	TE – 803(B)	Industrial Project	0	0	16	8	40	60	100
			Total	0	0	16	8			

PROGRAM ELECTIVE – III										
S. N.	Category	Subject Code	Title	Teaching Hours Per Week			Credit s	Examination		
				L	T	P/ D		I.A Marks	ESE Marks	Total Marks
1	PE	TE – 801(A)	Textile Reinforced Composite	3	0	0	3	40	60	100
2	PE	TE – 801 (B)	High Performance and Speciality fibres	3	0	0	3	40	60	100
3	PE	TE – 801 (C)	Application of CAD/ CAM in Textile	3	0	0	3	40	60	100
4	PE	TE – 801 (D)	Application of Nanotechnology in textile	3	0	0	3	40	60	100
5	PE	TE – 801 (E)	Smart Textile	3	0	0	3	40	60	100

PROGRAM ELECTIVE – IV										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Cre dits	Examination		
				L	T	P/ D		I.A Marks	ESE Marks	Total Marks
1	PE	TE – 802 (A)	Waste Management and Pollution Control in Textile	3	0	0	3	40	60	100
2	PE	TE – 802 (B)	Energy Management and Conservation in Textile Industry	3	0	0	3	40	60	100
3	PE	TE – 802 (C)	Clothing Comfort	3	0	0	3	40	60	100
4	PE	TE – 802 (D)	Green Processing Of Textiles	3	0	0	3	40	60	100
5	PE	TE – 802 (E)	Financial Management In Textile Industry	3	0	0	3	40	60	100

Note: Industrial Project of Four month's duration is to be carried out by the student exclusively in industry under the joint supervision of faculty advisers from institution as well as from the industry.



SEMESTER-III

MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties - Function of Random variables.

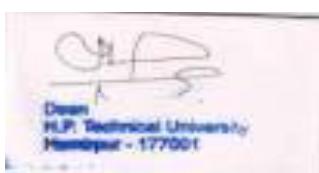
UNIT – III

Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

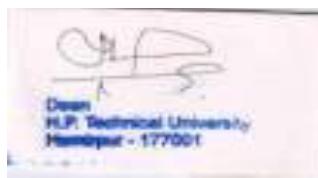


Text Books:

19. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
20. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
21. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers", 5th Edition, 2011.

Reference books:

19. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearson Education, Delhi, 2002.
20. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
21. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists" 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics - Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

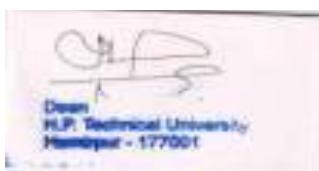
UNIT - II

Value Analysis - Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management; organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.



Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages,incentives, recruitment, training and industrial relations.

UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet, break evenanalysis - basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketingenvironment, marketing mix, advertising and sales promotion.

Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

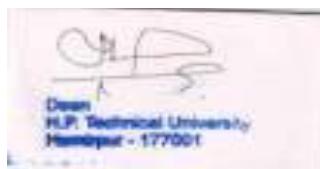
Text Books:

13. PanneerSelvam, R, “*Engineering Economics*”, Prentice Hall of India Ltd, New Delhi.

14. Dwivedi, D.N., “*Managerial Economics, 7/E*”, Vikas Publishing House.

Reference Books:

61. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., “*Engg. Economy 15/E*”,Prentice Hall, New York, 2011.
62. Chan S. Park, “*Contemporary Engineering Economics*”, Prentice Hall of India, 2002.
63. F. Mazda, *Engg.Management*, Addison Wesley, Longman Ltd., 1998.
64. O. P. Khanna, *Industrial Engg.and Management*,DhanpatRai and Sons, Delhi, 2003.
65. P. Kotler, *Marketing Management, Analysis, Planning, Implementation and Control*,Prentice Hall, New Jersey, 2001.
66. VenkataRatnam C.S & Srivastva B.K,*Personnel Management and Human Resources*, Tata McGraw Hill.
67. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill.
68. Bhattacharya A.K., *Principles and Practice of Cost Accounting*, Wheeler Publishing.
69. Weist and Levy, *A Management guide to PERT and CPM*, Prantice Hall of India.
70. Koontz H.,O'Donnell C.,&Weihrich H, *Essentials of Management*, McGraw Hill.



TE – 301 TEXTILE MACHINES AND PROCESSES

Teaching Scheme				Marks			Duration of End Semester Examination	
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total		
2	2	0	3		40	60	100	3 Hrs

Note: - The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks. Apart from this, paper setter will set question No 9 which will be compulsory and cover the entire syllabus. The question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

General and Numbering Systems: - Topic including job and entrepreneurial opportunities of textile technologist, general nomenclature related to textile. Flow chart of conversion of fiber into finished garment. Direct and indirect system, relationship among different numbering systems.

Fibres: Classification of natural and manmade fiber, basic requirement of fiber forming polymer and fibres. Elementary idea of polymerization, crystallinity and orientation.

UNIT- II

Yarn formation: Objectives of spinning, conventional and non-conventional methods of yarn formation. Elementary idea of conversion of fiber into yarn, the objectives all the processes and machineries involved in it viz. blow room, card, comber, draw frame, speed frame, ring frame. Function of twist on plied yarns. Different methods for the production of synthetic yarn. Difference between staple and filament yarn.

Preparatory process: Objectives of winding, doubling, warping, beam and sectional warping, sizing drawing in process.

UNIT – III

Fabric formation: Weaving, knitting and non-woven. Idea of conventional and non-conventional weaving, basic motions of weaving, basic weaves and designs.

Chemical processing: Elementary ideas of singeing, desizing, scouring, bleaching, mercerization. Dyeing: classification and brief methodology its type. Printing: various methods and styles of printing, introduction to J-box, padding mangle, jigger, winch.

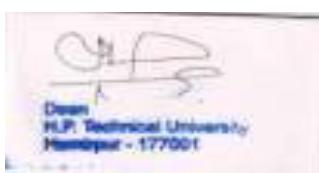
UNIT-IV

Finishing: classification of finishes, elementary idea of calendering, sanforization, softening, easy care, flame retardant, anti-static, anti-pilling, water repellent, oil repellent, anti-bacterial and uv protective finish.

Garment manufacturing: Garment industry and general nomenclature of garment industry. Main processes required for conversion of fabric into finished garment.

TEXT BOOKS

1. Gohl E P G and Valensky, "Textile Science," 2nd Ed., CBS Publisher, New Delhi (1999).
2. Shenai V A, "Textile fiber", Vol.1, 2nd Ed., Sevak Publication, Bombay (1991)



REFERENCE BOOKS

1. Pattabhiram T K, "Essential Elements of Textile calculations", 3rd Ed., Mahajan Publishers Ahmedabad (1985).
2. Klein W, "Manual of Textile Technology", Vol.1, 1st Ed., The Textile Institute, Manchester (1995).
3. Trotman E R, "Dyeing and Chemical Technology of Textile Fibres", Charles Griffin and Co. Ltd, London (1975)



TE – 302 NATURAL FIBRE

Teaching Scheme				Marks			Duration of End Semester Examination	
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total		
3	0	0	3		40	60	100	3 Hrs

Note: - The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks. Apart from this, paper setter will set question No 9 which will be compulsory and cover the entire syllabus. The question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction: Historical Evolution of Textiles. Definition of Textiles, Fibre, Staple fibre, Filament, Yarn, Thread, Fabric and Clothing. Essential and desirable properties of textile fibres. Requirement of fibre forming polymers. Classification of textile fibres.

Polymers: Degree of Polymerization. Types of polymer, Orientation and crystallinity in fibres. Micro-structure of textile fibre and filament.

UNIT-II

Cotton – Varieties: Genetically modified Cotton, Organic Cotton & Coloured Cotton, Cultivation and harvesting, Chemical composition, Chemical structure, Morphological structure, Physical properties, Chemical properties and uses.

Bast Fibres: Jute: Cultivation, Retting, Fibre Extraction and Properties. Sisal: Chemical composition, Properties, Fibre structure, Production and early processing. Ramie: Chemical composition, properties and processing of Ramie fibre. Hemp: Physical and chemical properties, Structure, Primary processing of Hemp stalk and Retting. Mudar fibre: Properties and composition. Varieties and uses –Kenaf, Banana and coir fibre.

UNIT-III

Protein Fibres: Wool – Types, Fibre extraction, Chemical Composition, Chemical structure, Morphological structure, Physical properties, Chemical properties and uses.

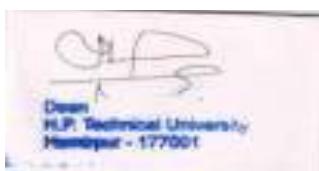
Silk – Types, Production of Raw silk, Wild silk, Spun silk, Chemical composition, Chemical structure, Physical properties, Chemical properties and uses. Spider Silk: Types and Properties.

Regenerated Protein Fibres-Principle of manufacture. Casein fibre. Vicara fibre. Ardil fibre. General properties.

UNIT-IV

Regenerated Cellulosic Fibres-Principle of manufacture, Viscose rayon production, Purification of viscose fibre, Physical properties, Chemical properties & Uses. Modification of viscose rayon. Other regenerated cellulosic fibres – Tencel, Modal and Bamboo. Unconventional natural fibres.

Identification of Fibres: Feeling Test. Burning test. Microscopic test Staining Test. Chemical test and Density measurement.

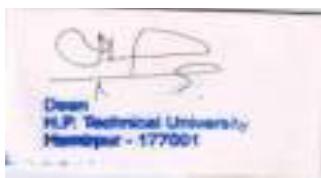


TEXT BOOKS

1. Mishra S P, "A Text Book of Fibre Science and Technology," New Age. International (P) Ltd., Pub., New Delhi, (2000).
2. Sreenivasamurthy H V "Introduction to Textile Fibres", The Textile Association India, Mumbai, (1998).
3. Gohl E.P.G & Valensky "Textile Science" CBS Publishers and Distributors, New Delhi, 2nd EdReprint- (2005).

REFERENCE BOOKS

1. Bernard P Corbman, "Textiles: Fibre to Fabric," McGraw Hill Book Co., Singapore, (1983). ISBN:0070131376
2. Marjory L Joseph, "Essentials of Textiles", CBS College Publishing, New York, (1984), ISBN:0030627389



TE – 303 YARN MANUFACTURE – I

Teaching Scheme				Marks			Duration of End Semester Examination	
L	T	P/D	Credit s	Sessional/ Internal Assessment	End Semester Exam	Total		
2	2	0	3		40	60	100	3 Hrs

Note: - The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks. Apart from this, paper setter will set question No 9 which will be compulsory and cover the entire syllabus. The question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Ginning: Objective of ginning, study of ginning machineries, Pre and post ginning, baling of fibers, latest developments.

Blow Room: Objectives, principles of mixing and blending, types of mixing and blending, mixing and blending machineries, blending performance, latest developments in blending machinery.

UNIT-II

Blow room Principles of opening and cleaning and its machinery, classification, study of opening and cleaning machine and its modern developments. Details of lap forming mechanism, feed regulating motion, calendar roller pressure, length measuring device, lap build, lap defects and its remedies. Chute feed to card.

Single line processing. Degree of opening and clearing. Performance assessment of blow room line. Machine and labour productivity. Norms. Calculations pertaining to blow room.

UNIT-III

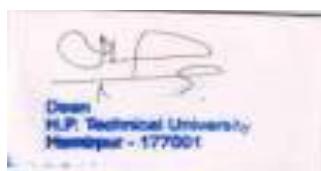
Carding: Objectives, principles of roller and clearer card, flat card, detail study of flat card and its components. Licker-in, cylinder, doffer and flats. Transfer of fiber. Card clothing. Web stripping and coiler system.

Semi high production card. High production card. Neps in carding web. Autoleveller in card. Latest developments. Machine and labour productivity. Norms. Performance assessment and calculations pertaining to carding.

UNIT-IV

Drawing: Objectives, principles of drawing and doubling. Detailed study of draw frame machine. Top and bottom rollers, top roller cots, roller weighting, drafting wave, roller slip and roller eccentricity.

Various drafting system, modern drawframe, autoleveller in drawframe, Machine and labour productivity. Norms. Performance assessment and calculation pertaining to draw frame machine.

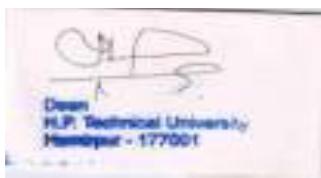


TEXT BOOKS

1. Klein W, "Manual of Textile Technology", Vol. I – III, The Textile Institute, UK (1987)
2. Oxtoby E, "Spun Yarn Technology", Butterworth and Co. Ltd. (1987).

REFERENCE BOOKS

1. Foster G A K, "Manual of Cotton Spinning", Vol. I –IV, The Textile Institute, Manchester (1958).
2. Salhotra K R, "Spinning of Man Made Fibres and Blends on Cotton Spinning System", The Textile Association, Mumbai (1989).
3. Khare A R, "Elements of Blowroom, Carding and Drawframe", Sai book Centre, Mumbai (1999).



TE – 304 FABRIC MANUFACTURE – I

Teaching Scheme				Marks			Duration of End Semester Examination	
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total		
3	2	0	4		40	60	100	3 Hrs

Note:- The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks. Apart from this, paper setter will set question No 9 which will be compulsory and cover the entire syllabus. The question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction to weaving: weaving process flow chart, Winding: Objectives, types of packages, types of winding machines, uniform buildup of cones, Mechanical and electronic type yarn clearer. Yarn tensioner: Additive, multiplicative, combined and compensating type.

Patterning: Reasons and remedies. Yarn path with different traverse ratio, Auto winders Autoconer: Objective, machine parameters.

Doubling: objective and types, TFO: Objectives, machine parameters, properties of TFO yarn, Yarn fault classifying systems, Pirn winding: Objectives, types of pirns, Hacooba pirn winding machine.

UNIT-II

Warping: Objectives, types of warping, conditions for warping, comparison of beam warping with sectional warping, basic features of warping machine, different types of creels, reeds, leasing systems, derivation for volume of yarn to be stored on beam, actors effecting warp quality on beam. Calculations related to warping

Sizing: Objectives, flow chart of sizing process with different zones, sizing machines: Twin and multi cylinder, Features of sizing machine, machine elements, sizing ingredients, size preparation, control points, Latest developments. Performance assessment and calculations.

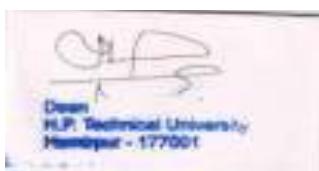
UNIT-III

Drawing In: Importance, manually and automatic drawing process, design with its drawing and lifting plan. Calculation of heald and read count. Weaving: History of weaving with manual and automatic loom, and modern loom revolutions. Overall concept about looms and its elements. Different motions of looms: Primary, secondary and auxiliary motions.

Shedding: Objective, Different types of shedding: Tappet, dobby, jacquard with advantage and disadvantages. Tappet shedding: its limitations, positive and negative shedding, types of shed, early and late shedding, shed timing, importance of bending factor.

UNIT-IV

Picking: Objective, Types of conventional picking: over picking and under picking with its mechanism, advantages and disadvantages, different picking accessories and their functions, Calculation of shuttle velocity and derivation for energy of picking, picking force. Picking timing such as late picking and early picking, reasons of false picking and shuttle fly.



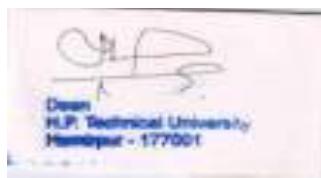
Beat up: Objective, Movement of sley, beat up, sley eccentricity and the factors which influence it, derivation for kinematic movement of sley, effects of distance, velocity and acceleration with respect to sley eccentricity on beat up force and timing available for shuttle passage. Calculation based on shedding, picking, sley movement, production, efficiency.

TEXT BOOKS

1. Talukdar M K, Srirammulu P K and Ajgaokar D B, "Weaving – Machine, Mechanism and Management", Mahajan Publisher Private Ltd., Ahmedabad, India (1998).
2. Mark R, Robinson A T C, "Principles of Weaving", The Textile Institute, Manchester (1986).

REFERENCE BOOKS

1. Booth J E, "Textile Mathematics", Part III, Textile Institute, Manchester (1977).
2. Dr.Sabit Adanur, "Hand book of weaving" Technomic Publishing Company Inc Lancaster, Basel, UK (2001)
3. Winding, BITRA Monograph Series, Bombay Textile Research Association, Bombay (1981).
4. Warping and Sizing", BTRA Monograph Series, Bombay Textile Research Association, Bombay (1981).
5. Woven Fabric, Manufacture – I, NCUTE, New Delhi (2002)
6. Lord P R and Mohamad M H, "Weaving: Conversion of Yarn to Fabric", Merrow Technical Library, UK (1988).



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT - I

Introduction to sociological concepts - structure, system, organization, social institution, Culture social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT -II

Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

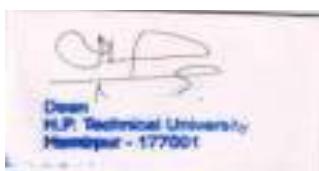
UNIT -III

Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.

UNIT - IV

From feudalism to colonialism -the coming of British; Modernity and struggle for independence.



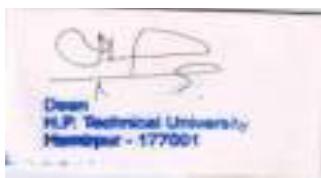
**Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India
2ndphase (LPG decade post 1991)**

Text Books:

1. Desai, A.R. (2005), Social Background of Indian Nationalism, Popular Prakashan.
2. Giddens, A (2009), Sociology, Polity, 6thEdition.
3. Chandoke, Neera& Praveen Priyadarshi(2009), contemporary India: Economy, Society and Politics, Pearson.

Reference Books:

1. Guha, Ramachandra(2007), India After Gandhi, Pan Macmillan.
2. Haralambos M, RM Heald, M Holborn (2000), Sociology, Collins.
3. Sharma R. S..(1965), Indian feudalism, Macmillan.
4. Gadgil, Madhab&RamchandraGuha(1999) - This Fissured Land: An Ecological History of India, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßige Verben im Präsens - "sein" und haben im Präsens - Personalpronomen im Nominativ.

UNIT- II

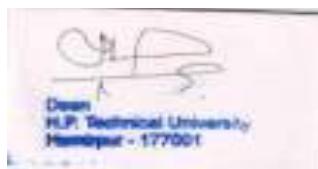
WichtigeSprachhandlungen: TelefonNummernverstehen und sprechen Uhrzeitenverstehen und sagen Verneinung "nicht und kein" (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notieren bestimmt und unbestimmter Artikel und Negativartikel im Nom. & Akkusativ

UNIT- III

WichtigeSprachhandlungen: Tageszeitenverstehen und überTermine sprechen- Verabredungen verstehen - Aufgaben im Haushalt verstehen

Grammatik: Personalpronomen im Akkusativ und Dativ - W-Fragen "wie, wer, wohin, wo, was usw.-Genitiv bei Personennamen - Modalverben im Präsens "können, müssen, möchten"



UNIT- IV

WichtigeSprachhandlungen:Sichaustauschen, was man kann, muss –BezeichnungenLebensmittel – Mengenangabenverstehen – PreiseverstehenundEinkaufzettelschreiben

Grammatik:Wortstellung in SätzenmitModalverben – Konnektor ”und” – “noch”-kein-----mehr – “wieviel, wieviele, wie alt, wie lange” –PossessivartikelimNominativ.

UNIT V

WichtigeSprachhandlungen:Freizeitanzeigenverstehen

HobbysundSportartenAnzeigenfürFreizeitpartnerschreibenbzw. daraufantworten –Vorlieben und Abneigungenausdrucken

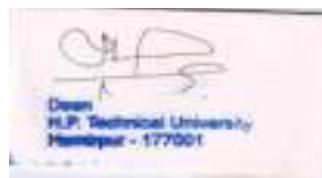
Grammatik:VerbenmitVokalwechselimPräsens – ModalverbenimPräsens“dürfen, wollen und mögen - “haben und sein” imPräteritum – regelmäßigeVerbenimPerfekt – Konnektoren “denn, oder, aber.

TEXT BOOK

1. Studio d A1. Deutsch alsFremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verbof self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the Frenchalphabet and the accents that play a vital role in the pronunciation of the words.

Writing:Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subjectpronouns.

Listening and Speaking: Pronunciation of words like Isabelle, presentezandla liaison – vousetes, vousappelez and role play of introducing each other –group activity.

Writing:Particulars in filling an enrolment / registration form.

Reading Comprehension: reading a text of a famous scientist and answeringquestions.

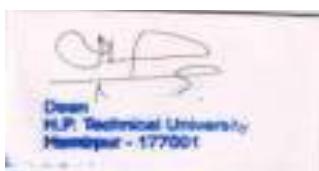
UNIT – III

Grammar and Vocabulary:Verb of possession “avoir’ and 1st group verbs“er”, possessive adjectives and pronouns of insistence- moi, lui..andnumbers from 0 to 20.

Listening and Speaking: Nasal sounds of the words like feminine, ceinture,parfum and how to ask simple questions on one’s name, age, nationality,address mail id and telephone number.

Writing:Conjugations of first group verbs and paragraph writing on self –introduction and introducing a third person.

Reading Comprehension: reading a text that speaks of one’s profile andanswering questions



UNIT – IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb “aimer” and seasons of the year and leisure activities.

Listening and Speaking: To express one’s likes and dislikes and to talk of one’s pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing: Conjugations of the irregular verbs: faire and savoir and their usage. Paragraph writing on one’s leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one’s way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs, a droite, la premiere a gauche and vocabulary relating to accommodation.

Listening and Speaking: To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing: Paragraph writing describing the accommodation using the different prepositions like en face de, derrière- to locate.

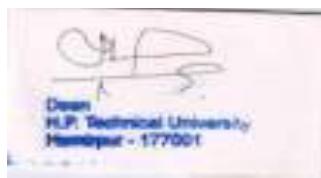
Reading Comprehension: A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliothèque?.....

TEXT BOOK

1. Tech French

REFERENCES

1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



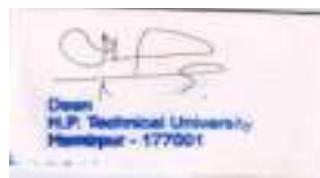
TE – 305 INTRODUCTION TO TEXTILE ENGINEERING LABORATORY

Teaching Scheme				Marks			Duration of End Semester Examination
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total	
0	0	2	1	30	20	50	3 Hrs

Note: Practical as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 10 experiments must be performed by a student during the semester:

List of Experiments

1. Preparation of lea and hank and calculation of fineness
2. Calculation of count of yarn using different instruments
3. Determination of twist.
4. To study the objects of different beaters/openers.
5. To study the working principle of trash analyzer.
6. To study the working principle and path of the material in a carding machine.
7. To study the working principle and path of the material in a drawing frame.
8. To study the working principle and path of the material in a roving frame
9. To study the working principle and path of the material in a spinning frame.
10. To study the working principle and path of the material in a winding machine.
11. To study the working principle of conventional weaving machine.
12. To study the working principle of non-conventional weaving machine.
13. To study the working principle and yarn path of circular and flat knitting machine.
14. Study of all the processing machines.
15. Dyeing of fabric/yarn with direct dyes.
16. Study of different techniques of printing.
17. Study of Non-Conventional spinning machine used in Textile industry.



TE – 306 TEXTILE FIBRE LABORATORY

Teaching Scheme				Marks			Duration of End Semester Examination
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total	
0	0	2	1	30	20	50	3 Hrs

Note: Practicals as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 10 experiments must be performed by a student during the semester:

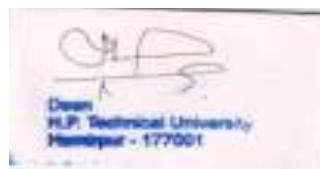
List of Experiments

Physical and Chemical identification of following Textile fibre(s)

1. Identification of cotton
2. Identification of wool
3. Identification of silk
4. Identification of Bast fibres
5. Identification of polyester
6. Identification of nylon
7. Identification of Acrylic
8. Identification of Polypropylene

Identification of fibres in blend and % fibre content in blend

9. Analysis of P/C blended fabric
10. Analysis of P/V blended fabric
11. Analysis of P/W blended fabric
12. Estimation of fibre/filament fineness using projection microscope.
13. Determine the thermal behavior of fibre by using DSC and TGA.
14. Identification of physical structure of fibre by XRD, SEM and NMR.
15. Identification of chemical structure of fibre by FTIR and spectrophotometer.



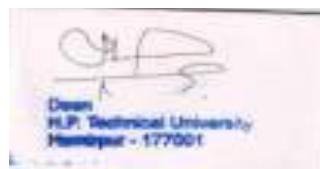
TE – 307 YARN MANUFACTURE - I LABORATORY

Teaching Scheme				Marks			Duration of End Semester Examination
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total	
0	0	2	1	30	20	50	3 Hrs

Note: Practical as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 10 experiments must be performed by a student during the semester:

List of Experiments

1. Study of general outline of opener and clearer machine employed in B/R line process.
2. Study of following in shirley trash analyser machine.
 - Chief organs.
 - Gearing arrangements.
 - Teeth inclination and teeth per inch.
3. Determination of trash content and analysis of waste by using trash analyzer machine.
4. Study of carding machine with technical details.
5. Study of gearing mechanism calculation of the speed of different organs of carding machine.
6. Calculation of draft between different zone and production of carding machine.
7. Study of card settings for different fibre lengths and types.
8. Maintenance and overhauling of carding machine.
9. Study of distribution of fibrous waste in a carding machine.
10. Study of the 'NEP -COUNT' in a card.
11. Study of drafting arrangement and top roller weighting system of draw frame machine.
12. Calculation of the total draft and its distribution in draw frame machine.
13. Effects of break draft and roller settings on sliver uniformity.
14. Measurement of nip-load pressure, roller eccentricity and shore hardness of top roller drafting rollers.
15. Maintenance and overhauling of draw frame machine.



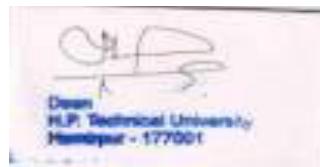
TE – 308 FABRIC MANUFACTURE - I LABORATORY

Teaching Scheme				Marks			Duration of End Semester Examination
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total	
0	0	2	1	30	20	50	3 Hrs

Note: Practical as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 10 experiments must be performed by a student during the semester:

List of Experiments

1. Study of the motion transmission system in winding machine.
2. Study of the effect of slub catcher, yarn tensioner and yarn guide on package formation.
3. Study of Package stop motion in cone winding machine.
4. Calculation of winding speed on grooved drum winding system and study of anti- patterning system incorporated to it.
5. Study of precision winding machine and mechanism of package building.
6. Study of the motion transmission system in Pirn winding machine.
7. Study of working principle of TFO machine and silent features of machine with yarn characteristics.
8. Study of working of Autoconer automatic winding machine with its machine elements.
9. Analysis of various fabric design with its drafting and lifting plan.
10. Construction of sections in sectional working machine and plan the width of a section according to the give striped fabric keeping in view the pattern.
11. To study the passage of yarn on a sizing machine and the features of various parts/ mechanism of the sizing machine.
12. To select the proper reed and heald for a weaver's beam keeping in mind the beam, loom size and fabric construction.
13. Study of shedding mechanism of shuttle loom and cam positioning with respect to loom cycle.
14. Study of picking mechanism of shuttle loom with picker movement in relation with crank shaft rotation and calculation of average velocity of shuttle.
15. Study of sley movement, construction and calculation of sley eccentricity



SEMESTER-IV

MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

UNIT – II

Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.



UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.

Approximation methods for nonlinear programming: Line search methods, gradient methods, conjugate gradient methods; Networking techniques – PERT and CPM.

UNIT - IV

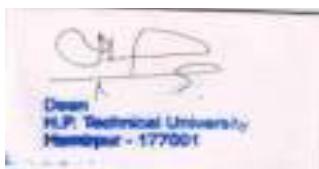
Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and its role in minimization, minimization under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

25. C. B. Gupta, "Optimization Techniques in Operation Research," I. K. International Publishing House Pvt. Ltd.
26. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
27. Mukesh Kumar Singh, "Calculus Of Variations" Krishna Prakashan Media (P) Ltd.
28. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

31. I. M. Gelf and S. V. Fomin, "Calculus of Variations" Dover Publications IncMineola, New York.
32. Purna Chand Biswal, "Optimization in Engineering, Scitech Publications India Pvt. Ltd.
33. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
34. G. Hadly, Linear Programming, Narosa Publishing House.
35. KantiSwarup, P. K. Gupta and Manmohan, "Operations Research," Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

9. Understanding the need , basic guidelines, content and process of value Education
10. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

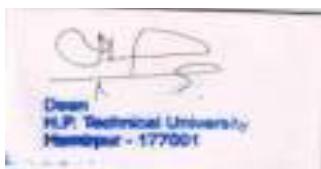
17. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
18. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
19. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
20. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

13. Understanding human being as a co-existence of the self and the body.
14. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
15. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

9. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
10. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.



UNIT V: Harmony in Family, Society and Nature

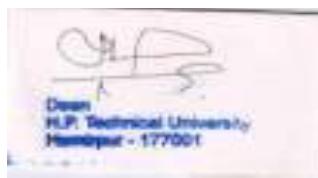
13. Understanding harmony in the family, society and nature.
14. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.
15. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

9. R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).
10. R R Gaur, R Sangal and G P Bagaria, Teacher's Manual (English), 2009.

Reference Books

25. E.F. Schumacher, Small is Beautiful; a study of economics as if people mattered, Blond & Briggs, Bratain, 1973.
26. PL Dhar, RR Gaur, Science and Humanism, common wealth publishers, 1990.
27. A.N. Tripathy, Human values, New Age International Publishers, 2003.
28. E.G. Seebauer& Robert, L BERRY, Foundational of Ethics for Scientists &Engineers, Oxford University Press, 2000.
29. M. Govindrajan, S.Natralan& V.S. Senthil Kumar, Engineering Ethics (including human Values), Eastern Economy Edition, Prentice hall of India Ltd.
30. B.L. Bajpai, 2004, Indian Ethos and Modern Management, New Royal book Co; Lucknow, 2004, Reprinted 2008.



TE – 401 MAN MADE FIBRE

Teaching Scheme				Marks			Duration of End Semester Examination	
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total		
2	2	0	3		40	60	100	3 Hrs

Note:- The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks. Apart from this, paper setter will set question No 9 which will be compulsory and cover the entire syllabus. The question should have objective or short answer type questions and shall be of 20 marks.

UNIT- I

Introduction to man-made fibres: Definition of man-made fibres. Brief history of manmade fibres. Relative merits and demerits of manmade fibres and natural fibres. Synthesis of raw materials from petrochemicals: elementary idea of synthesis of raw materials viz. DMT, TPA, MEG, Caprolactam, Acrylonitrile, propylene. Raw materials for rayons.

Polymer Production: PET through TPA and DMT route, Nylon 66 and Nylon 6 - Acrylic - Polypropylene - Elastomeric - Polyvinyl and Aramid fibres.

UNIT- II

Fundamentals of the fibre spinning process: Physical fundamentals of the fibre spinning process - spinnability of liquids, rheology of spinning, mechanics of spinning, formation of fibre structure .

Melt Spinning Equipments: Melting device, Grid and extruder, Static mixer, Pre-filtration, Manifold, Spin pack, Spinneret, Quenching chamber, Spin finish application, Take-up winding. Staple fibre line production details, high speed spinning - Polyester, Polyamide and Polypropylene.

UNIT- III

Wet and Dry Spinning: Preparation of dope, extrusion and fibre formation. Comparison of wet and dry spinning processes. Dry-jet-wet spinning, Gel spinning. Viscose rayon and variants.

Drawing and Heat Setting: Neck drawing, drawing systems, influence of drawing on structure and properties of fibres. Types of heat setting, influencing parameters on heat setting, influence of heat setting on fibre behaviour.

UNIT- IV

High performance fibres: polymerization, spinning of high performance fibres and their applications.



Modified Synthetic Fibres: Differentially dyeable fibres, Antistatic fibres, Flame retardant fibres, Micro fibres Bicomponent fibres - Cationic dyeable polyester, Polyblend fibres, Tencel .

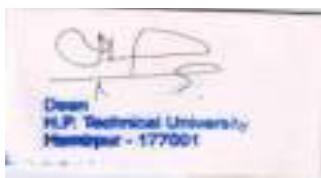
Quality Control: Methods for Molecular weight measurements, Thermal characteristic measurements. Testing of filament yarns and staple fibres- denier, tenacity, elongation modulus. - draw force, shrinkage force.

TEXT BOOKS:

1. Vaidya A A, "Production of Synthetic fibres", Prentice-Hall of India Pvt. Limited., New Delhi (1988).
2. McIntyre.J.E, " Synthetic Fibres", Univ of Leeds, UK,(2000)

REFERENCE BOOKS

1. Gupta V R and Kothari V K, "Manufactured fibre Technology", Chapman & Hall Publication, (1997).
2. Klein W, "Man Made Fibres and their processing", Vol.6, The Textile Institute, (1996)



TE- 402 TEXTILE CHEMICAL PROCESSING-I

Teaching Scheme				Marks			Duration of End Semester Examination	
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total		
3	0	0	3		40	60	100	3 Hrs

Note: - The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks. Apart from this, paper setter will set question No 9 which will be compulsory and cover the entire syllabus. The question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction: Overview, flowsheet and justification of chemical processing of textile materials and blend, prelims of preparation: grey testing-stamping-mending-stitching,. Overview on the chemical processing of knitted fabrics.

Singeing and Desizing: Objectives, suitability of material. Singeing methods: plate, roller and gas singeing, merits and demerits, precautions, advancement, bio-singeing. Objectives and methods of desizing: hydrolytic & oxidative processes, viz. rot, acid, enzyme, chlorine. Chlorite and bromire methods, influence of controlling parameters, merits and demerits of each method; mechanism of removal of starch in all these processes, evaluation of desizing efficiency.

Unit-II

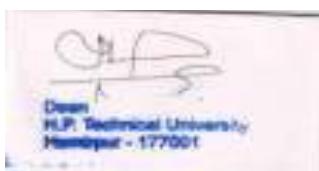
Scouring: Objective, impurities in cotton and their chemical nature and possible methods of removal, importance of alkali scouring, surfactants, enzymatic scouring. Factors affecting scouring, methods of scouring, different scouring equipment e.g., High pressure kier, steamer, their construction, working principle, capacity, solvent scouring, scouring of colored cotton, method of evaluation of scouring efficiency

Bleaching: Objective, classification of bleaching methods, different bleaching agents, their relative merits and demerits, hypochlorite, chlorite, peroxide bleaching, their mechanisms, bleaching parameters, methods of bleaching, role of chemicals used in bleaching, method of evaluation of bleaching efficiency, principle/mechanism, properties, and method of application of optical whitening agents.

UNIT-III

Mercerization:

Objectives, mechanism related to various physical and chemical changes in cotton during merce- rization.Process parameters and operation,causticization. Barium activity number, its determination an d interpretation. Wet and hot mercerization. Ammonia treatment of cotton. Performance of



different mercerization processes. Treatment with liquid ammonia: Objective, methods, relative merits and demerits, evaluation.

Heat setting: Objectives, types, mechanism of setting in each type. Heat setting conditions, controls and efficiency. Heat setting of polyester, nylon, acetate and their blends, machines involved in heat setting, Evaluation of heat setting efficiency.

UNIT-IV

Mechanical Finishes: introduction to finishing, its importance and classification. Physical and chemical softening processes, selection of chemical and evaluation of softening., Calendering – objectives, its types, construction and function of various calendering m/cs; Influencing parameters of calendaring. Sanforizing – objectives, method, mechanism and machineries involved. Evaluation of sanforizing.

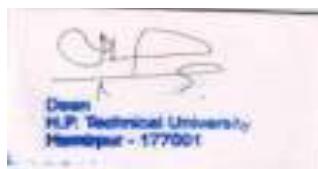
Chemical finishes : Problem of creasing, anti-crease finish on cotton. Choice of chemical, catalyst and process parameters. Drawback and advantages associated with use of various anti-crease chemicals. Measures to reduce release of formaldehyde. Water repellency and water repellent finishes on cotton. Evaluation of water repellency, flame retardant finish, anti static, anti pilling , Novel finishing techniques: elementary idea of Enzymatic finish, plasma treatment, nano finishing and micro-encapsulation

TEXT BOOKS

1. Shenai V.A, "Technology of Bleaching and Mercerisation", Sevak Publications, Mumbai (1991)
2. Peters R. H, "Textile Chemistry", Vol - II, Elsevier Publishing Company, London (1967).
3. Karmakar S R, Chemical Technology in Pre-Treatment Processes of Textiles, Elsevier, Publishing Company, London (1999).

REFERENCE BOOKS

1. Nunn D M, "The Dyeing of Synthetic Polymer and Acetate Fibres", Dyers Company Publication Trust, London (1979).
2. Mittal R M and Trivedi S S, "Chemical Processing of polyester / cellulosic Blends", AhmedabadTextile Industries Research Association, Ahmedabad, India.



TE – 403 YARN MANUFACTURE-II

Teaching Scheme				Marks			Duration of End Semester Examination	
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total		
2	2	0	3		40	60	100	3 Hrs

Note:- The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks. Apart from this, paper setter will set question No 9 which will be compulsory and cover the entire syllabus. The question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Combing process: Objectives, combing for shorter and medium varieties of cotton, cottons suitable for combing, preparation of stock for combing, combing cycle, role of machine components and settings.

Noil extraction at backward feed and forward feed comber, mathematical problems, norms, performance assessment. Machine and labour productivity. Recent developments.

UNIT-II

Process related to roving formation: Objectives, functions of different machine components and high drafting system, roving twist in speed frame, winding principles and equations related to bobbin leading and flyer leading,

Building motion, cone profile, numerical problems, norms, performance assessment. Machine and labour productivity. Developments in speed frame.

UNIT-III

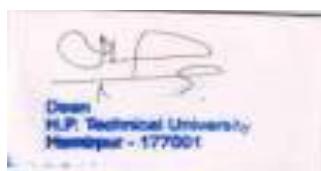
Ring spinning Process: Function and mode of operation of ring frame, role of drafting system, yarn guiding devices, forces acting between ring and traveler, yarn tension variation, balloon tension at maximum diameter, tasks of traveller, limiting speed, classification, form of traveler, traveler mass and material, different ring-traveller combinations, fiber lubrication, running on new-ring,

Winding process, cop building, cylinder and conical tip, spinning geometry, causes of end breaks, numerical problems, norms, performance assessment. Machine and labour productivity. Latest developments including compact spinning.

UNIT-IV

Non-conventional spinning processes: Principle of open end spinning, rotor spinning, chief organs and their functions, yarn properties in comparison with ring-spun yarn,

Friction and air jet spinning: principle of friction spinning, function of chief organs, yarn properties and comparison of Dref-II and Dref-III friction spinning machines, basic principle to air jet spun yarn, functions of chief organs, yarn properties, numerical problems, norms, performance assessment. Machine and labour productivity.

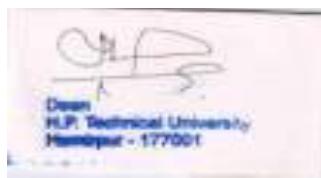


TEXT BOOKS

1. Klein W, "Manual of Textile Technology", The Textile Institute (1995).
2. Khare A R, "Elements of Combing", Sai book center, Mumbai (1999).

REFERENCE BOOKS

1. Khare A R "Elements of Ring Frame and Doubling", Sai book Centre, Mumbai (2000).
2. Salhotra K R, "Spinning of Man Mades and Blends on Cotton System", The Textile Association of India, Mumbai (1989).
3. Chattopadhyay R and Rengasamay R, "Spinning: Drawing, Combing and Roving", NCUTE-Pilot Programme (1999).



Teaching Scheme				Marks			Duration of End Semester Examination	
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total		
3	0	0	3		40	60	100	3 Hrs

Note:- The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks. Apart from this, paper setter will set question No 9 which will be compulsory and cover the entire syllabus. The question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Let-off System: Objective and types, types of tension variation, Warp and cloth control, different types of let-off systems, control of tension variation.

Take-up: Objective, Types of take-up and their mechanisms, periodic faults, anti crack motion, dividend calculation, and control of pick density, calculation related to it.

UNIT-II

Warp Stop: Objective, Types of warp stop motions and their functioning, mechanism, advantage and disadvantage. **Weft Stop:** objective, Types of weft stop motions and their functioning, mechanism, advantage and disadvantage.

Warp protector: Objective, Types of warp protector motions and their functioning, mechanism, advantage and disadvantage. **Temple:** objective, importance and types.

UNIT-III

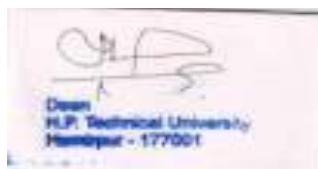
Weft Replenishment System: Pirn replenishment mechanism: Cimmco and Ruti C, its limitations, different types of feelers used for it. Shuttle changing mechanism, bobbin loader mechanism and automatic loom winder.

Box changing motion: Objective, types, its advantage and disadvantage, Working mechanism of multiple box motions: weft mixing, cow burn, sliding gear box, pick at will.

UNIT-IV

Dobby: Scope of dobby, different types of dobby: Keighley, climax, cam, paper, rotary, positive, cross border and their mechanism pegging system as per design of weave.

Jacquard: Scope of jacquard, working of different types of jacquards: single lift single cylinder, double lift single cylinder, double lift double cylinder, electronic jacquard. Harness ties and design ties, card punching machine.

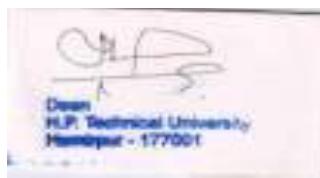


TEXT BOOKS

1. Mark R and Robinson A T C, "Principles of Weaving", The Textile Institute, Manchester (1986).
2. Talukdar M K, Srirammulu P K and Ajgaokar D B, "Weaving – Machine, Mechanism and Management", Mahajan Publisher Private Ltd., Ahmedabad, India (1998).

REFERENCE BOOKS

1. Aswani K T, "Fancy Weaving mechanism", Mahajan Publisher Private Ltd., Ahmedabad, India (1990)
2. Lunenschloss J and Albrecht W, "Non-woven Bonded Fabric", Ellis and Horwood Ltd, U.K. (1985).
3. Lord P R and Mohamad M H, "Weaving: Conversion of Yarn to Fabric", Merrow Technical Library, UK (1988).



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - Golak Nath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

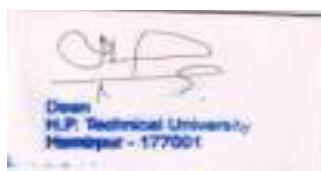
UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.

UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial



review of administrative actions, exclusion of judicial review and concept of “Ombudsman”; Right to Information Act, 2005 (Sub Section 1 - 20)

Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

19. D.D. Basu, Shorter Constitution of India, Prentice Hall of India, (1996)
20. MeenaRao, Fundamental concepts in Law of Contract, 3rd Edn. Professional Offset, (2006)
21. H.O.Agarwal, International Law and Human Rights, Central Law Publications, (2008)

Reference Books:

31. H.M. Seervai, Constitutional Law of India, Tripathi Publications, (1993).
32. S.K. Kapur, Human Rights under International Law and Indian Law, Central Law Agency, (2001)
33. NeelimaChandiramani, The Law of Contract: An Outline, 2nd Edn. Avinash Publications Mum, (2000)
34. Avtarsingh, Law of Contract, Eastern Book Co., (2002).
35. Anson W.R.(1979), Law of Contract, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verbenmituntrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

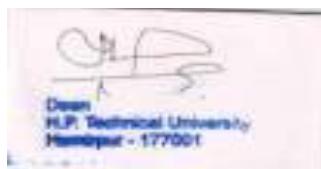
Wichtige Sprachhandlungen: Kleidung, Farben, Materialien.

Grammatik: formelle Imperativsätze mit "Sie" informelle Imperativsätze Vorschläge mit "wir" – "sollen/wollen wir" - Sollich? Modalpartikeln "doch" "mal" "doch mal".

UNIT - III

Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ "alle", "man" Indefinitepronomen "etwas", "nichts".



UNIT - IV

Wichtige Sprachhandlungen: Essen und Trinken im Restaurant, Partyvorbereitung und Feier.

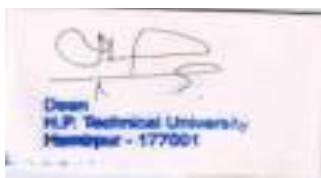
Grammatik: Nomen aus Adjektiven nach "etwas" und "nichts" Nomen aus dem Infinitiv von Verben, zusammengesetzte Nomen und ihre Artikel. Adjektive im Nom. und Akk. nach unbestimmten Artikel, Negativartikel und Possessivartikel.

TEXT BOOK

7. Studio d A1. Deutsch als Fremdsprache with CD. (Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

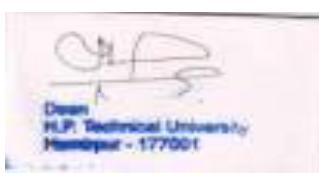
Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.

UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.



UNIT - IV

Grammar and Vocabulary –the verbs: manger, boire, the partitive articles

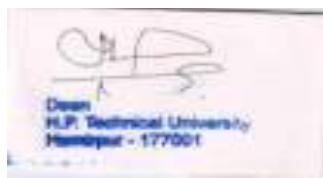
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading –reading a text.

TEXT BOOK

7. Tech French

REFERENCES

1. French for Dummies.
2. French made easy: Goyal publishers.
3. Panorama.



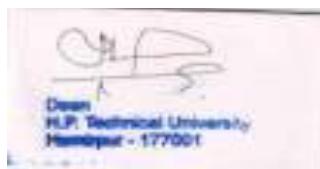
TE- 405 TEXTILE CHEMICAL PROCESSING-I LABORATORY

Teaching Scheme				Marks			Duration of End Semester Examination
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total	
0	0	2	1	30	20	50	3 Hrs

Note: Practical as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 10 experiments must be performed by a student during the semester:

List of Experiments

1. Desizing of cotton material.
2. Scouring of cotton goods
3. Scouring of polyester goods
4. Scouring of P/C blended goods
5. Scouring of wool fibre
6. Scouring of woven cotton fabric using Jigger
7. Bleaching of cotton with H₂O₂
8. Bleaching of cotton with NaClO₂
9. Bleaching of cotton with NaOCl
10. Bleaching of Polyester
11. Bleaching of P/C blend
12. Bleaching of jute yarns / fabric
13. Bleaching of knitted cotton fabric using Winch
14. Degumming of silk
15. Mercerisation of cotton material

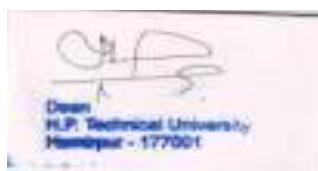


Teaching Scheme				Marks			Duration of End Semester Examination
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total	
0	0	2	1	30	20	50	3 Hrs

Note: Practical as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 10 experiments must be performed by a student during the semester:

List of Experiments

1. To estimate head to head difference in noil level & study the effect of feed per nip on percentage in nep level during combing. (mill based study).
2. To study the drafting, twisting and winding zone of speed frame.
3. To study the building motion in speed frame & the differential motion of speed frame.
4. Calculation of bobbin speed, break draft constant, draft constant and twist constant and production of speed frame.
5. To study the influence of machine and process parameters on roving unevenness (mill based study).
6. To study the drafting, twisting, winding zone and the building motion in ring frame.
7. Calculation of draft constants, twist constant, coils per inch and production of ring frame.
8. To ascertain the effect of break draft and total draft on yarn unevenness and strength (mill based study).
9. Estimation of spinning tension as a function of traveller weight, yarn count and balloon height (mill based study).
10. To perform various settings and maintenance operation on ring frame such as:
 - ❖ Ring rail levelling
 - ❖ Spindle gauging
 - ❖ Spindle eccentricity
 - ❖ Lappet eccentricity
11. To study the influence of spindle speed and traveller weight on hairiness.
12. Study the chief organs, mechanism and calculations of open end and friction spinning machines.
13. To study the timing diagram of a comber and the nature of movement of nipper assembly
14. To study the function of top comb and its depth of penetration with reference to noil extraction and fractionating efficiency (mill based study).
15. To study the effect of type of feed and detachment setting on noil percentage and fractionating efficiency.



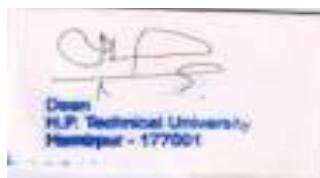
TE – 407 FABRICMANUFACTURE - II LABORATORY

Teaching Scheme				Marks			Duration of End Semester Examination
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total	
0	0	2	1	30	20	50	3 Hrs

Note: Practical as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 10 experiments must be performed by a student during the semester:

List of Experiments

1. Study of take up motion and calculation of loom take up constant.
2. Study of let-off system in a loom.
3. Study of warp stop motion in a loom.
4. Study of weft stop mechanism.
5. Study of Warp protection motion in a loom.
6. Study of temple motions in a loom.
7. Study of selvedge formation in shuttle loom.
8. Study of pirn changing mechanism in a loom.
9. Study of loom winder mechanism in a loom.
10. Study of shuttle changing mechanism in a loom.
11. Study of multiple box motion in a loom.
12. Identification of fabric faults by fabric inspection machine.
13. Study of Dobby loom
14. Study of Jacquard loom.
15. Preparation of various designs by using Jacquard Punching Machine.



MC – 401: ORAL AND WRITTEN COMMUNICATION SKILLS LABORATORY-II

Teaching Scheme				Marks			Duration of End Semester Examination
L	T	P/D	Credits	Sessional/ Internal Assessment	End Semester Exam	Total	
0	0	2	1	30	20	50	3 Hrs

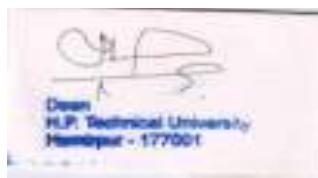
Note: Practical as per the topics in the syllabus for the course will be conducted in the laboratory class. Following is the suggested list of exercises out of which a minimum of 7 experiments must be performed by a student during the semester:

List of Practicals:

1. Phonetics: Organs of speech, speech sounds, symbols, articulation of speech sounds- stress and intonation.
2. SWOT analysis (Personal / Organization)
3. Group discussion
4. Debate
5. Vocabulary improvement programs
6. Technical write up based on critical thinking (On subject allocated by coordinator)
7. Telephonic etiquettes: Preparing, Controlling and Follow up.

RECOMMENDED BOOKS:

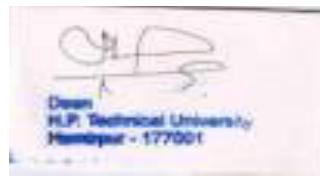
1. Developing Communication Skills: by Krishan Mohan & Meera Bannerji
2. Group Discussions by Sudha Publications And Ramesh Publishing House, New Delhi
3. Vocabulary Improvement: Words Made Easy: by Diana Bonet
4. Word Power Made Easy: by Norman Lewis



J. DETAILED SYLLABI OF COURSES

SCHEME OF TEACHING AND EXAMINATION B.TECH AUTOMOBILE ENGINEERING										
SEMESTER – III										
S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	AU-301	Elements of automobile Engineering	3	1	0	4	40	60	100
4	PC	ME-301	Strength of Material-I	3	1	0	4	40	60	100
5	PC	ME-303	Engineering Thermodynamics	3	0	0	3	40	60	100
6	PC	ME-304	Machine Drawing	2	0	3	3	40	60	100
7	OE	-	Open Elective-I	2	0	0	2	40	60	100
Labs:										
1	PC	ME-305	Strength of Material Lab	0	0	2	1	30	20	50
2	PC	AU-302	Elements of automobile Engineering Lab	0	0	2	1	30	20	50
3	MC	ME-307	Computer Aided Design(CAD) Lab-I	0	0	3	2	30	20	50
			Total	16	4	10	24+2			

OPEN ELECTIVE – I										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS-306	Sociology & Elements of Indian History for Engineers	2	0	0	2	40	60	100
2	OE	HS-307	German Language - I	2	0	0	2	40	60	100
3	OE	HS-308	French Language - I	2	0	0	2	40	60	100



**'SCHEME OF TEACHING AND EXAMINATION
B.TECH AUTOMOBILE ENGINEERING**

SEMESTER – IV

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Human Values and Professional Ethics	2	2	0	3	40	60	100
3	PC	AU-401	Auto fuel and Lubricants	3	0	0	3	40	60	100
4	PC	AU-402	Fluid Mechanics & Fluid Machines	3	1	0	4	40	60	100
5	PC	ME-402	Strength of Material-II	3	1	0	4	40	60	100
6	PC	ME-403	I.C Engines	3	0	0	3	40	60	100
7	OE	-	Open Elective-II	2	0	0	2	40	60	100

Labs:

1	PC	ME-405	I.C. Engine Lab	0	0	2	1	30	20	50
1	PC	AU-403	Auto fuel and Lubricants lab	0	0	2	1	30	20	50
3	MC	AU-404	Fluid Mechanics & Fluid Machines Lab.	0	0	3	2	30	20	50
			Total	16	6	7	24+2			

OPEN ELECTIVE – II

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	OE	HS-410	Law for Engineers	2	0	0	2	40	60	100
2	OE	HS-411	German Language – II	2	0	0	2	40	60	100
3	OE	HS-412	French Language – II	2	0	0	2	40	60	100



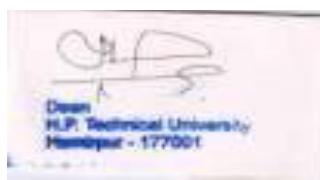
SCHEME OF TEACHING AND EXAMINATION
B.TECH AUTOMOBILE ENGINEERING

SEMESTER – V

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	PC	AU-501	Automotive Electricals & Electronics	3	0	0	3	40	60	100
1	PC	ME-502	Kinematics of Machines	2	2	0	3	40	60	100
3	PC	ME-503	Heat Transfer	3	1	0	4	40	60	100
4	PC	ME-504	Machine Design-I	3	1	0	4	40	60	100
5	PC	ME-505	Computer Aided Design(CAD)	2	2	0	3	40	60	100
6	PC	ME-506	Materials Technology	3	0	0	3	40	60	100
7	OE	-	Open Elective-III	2	0	0	2	40	60	100
Labs:										
1	MC	ME-507	CAD Lab-II	0	0	3	2	30	20	50
2	PC	ME-509	Heat Transfer Lab	0	0	2	1	30	20	50
3	PC	AU-502	Automotive Electricals & Electronics lab	0	0	2	1	30	20	50
Total				16	6	7	24+2			

OPEN ELECTIVE – III(FOR STUDENTS OF OTHER DEPARTMENTS)

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credit s	Examination		
				L	T	P/ D		I.A Marks	ESE Marks	Total Marks
1	OE	ME-510	Robotics	2	0	0	2	40	60	100
2	OE	ME-511	Automobile Technology	2	0	0	2	40	60	100
3	OE	ME-512	Rural Technology & Community Development	2	0	0	2	40	60	100



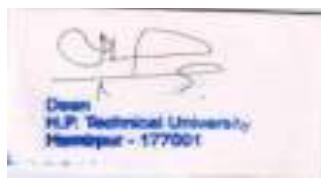
SCHEME OF TEACHING AND EXAMINATION
B.TECH AUTOMOBILE ENGINEERING

SEMESTER – VI

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PC	ME-601	Computer Aided Manufacturing (CAM)	3	1	0	4	40	60	100
2	PC	ME-602	Measurement and Control	3	0	0	3	40	60	100
3	PC	ME-603	Machine Design-II	3	1	0	4	40	60	100
4	PC	ME-604	Operation research	2	2	0	3	40	60	100
5	PC	ME-606	Dynamics of Machine	2	2	0	3			
6	PC	AU-601	Manufacturing Processes	3	0	0	3	40	60	100
7	OE	-	Program Elective-I	3	0	0	3	40	60	100
Labs:										
1	PC	ME-607	Computer Aided Manufacturing(CAM) Lab	0	0	2	1	30	20	50
2	PC	ME-608	Theory of Machine Lab	0	0	2	1			50
3	MC	ME-609	Seminar	0	0	3	2	30	20	50
			Total	16	6	7	24+3			

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credit s	Examination		
				L	T	P/ D		I.A Marks	ESE Marks	Total Marks
1	PE	AU-602	Automotive Air Conditioning	3	0	0	3	40	60	100
2	PE	AU-603	Combustion Engineering	3	0	0	3	40	60	100
3	PE	AU-604	Marketing and Sales Management	3	0	0	3	40	60	100

Industrial /Practical Training after VI Semester of six weeks duration

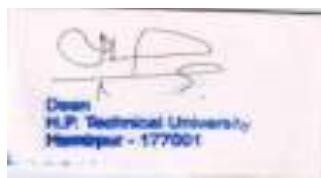


**SCHEME OF TEACHING AND EXAMINATION
B.TECH AUTOMOBILE ENGINEERING**

SEMESTER – VII

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1.	PC	AU-701	Automotive Pollution & Control	3	0	0	3	40	60	100
2.	PC	ME701	Industrial automation and Robotics	3	0	0	3	40	60	100
3	PC	ME-702	Refrigeration & Air Conditioning	3	1	0	4	40	60	100
4	PC	ME-704	Industrial Engineering & Production Management	2	2	0	3	40	60	100
5	OE	-	Program Elective-I	3	0	0	3	40	60	100
Labs:										
1	MC	ME-706	Automation and Robotics Lab	0	0	3	2	30	20	50
2	MC	AU-702	Project Work -I	0	0	4	2	30	20	50
3	PC	AU-703	Industrial /Practical Training(Viva-Voce)	0	0	4	2	30	20	50
4	PC	AU-704	Automotive Pollution & Control Lab.	0	0	2	1	30	20	2
			Total	11	3	13	20+3			

PROGRAM ELECTIVE –II										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credit s	Examination		
				L	T	P/ D		I.A Marks	ESE Marks	Total Marks
1	PE	AU-705	Tractor And Farm Equipments	3	0	0	3	40	60	100
2	PE	AU-706	Hybrid Vehicles	3	0	0	3	40	60	100
3	PE	AU-707	Motor Vehicle And Environment Protection	3	0	0	3	40	60	100



SCHEME OF TEACHING AND EXAMINATION
B.TECH AUTOMOBILE ENGINEERING

SEMESTER – VIII (CBCS)

S. N.	Cat.	Course Code	Subject	Teaching Hours Per Weak			Credits	Examination		
				L	T	P/D		I. A Marks	ESE Marks	Total Marks
1	PE		Programme Elective - III	3	0	0	3	40	60	100
2	PE		Programme Elective - IV	3	0	0	3	40	60	100
3	MC	AU-807	Project Work - II	0	0	16	8	40	60	100
			Total	6	0	16	8+6			

OR

4	MC	AU-808	Industrial Project	0	0	16	8	40	60	100
			Total	0	0	24	8			

PROGRAM ELECTIVE -III

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credit s	Examination		
				L	T	P/ D		I.A Marks	ESE Marks	Total Marks
1	PE	AU-801	Vehicle Body Engineering	3	0	0	3	40	60	100
2	PE	AU-802	Entrepreneurship Development	3	0	0	3	40	60	100
3	PE	AU-803	Flexible Manufacturing System	3	0	0	3	40	60	100

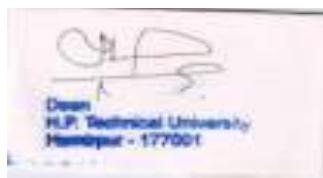
PROGRAM ELECTIVE -IV

S. N.	Cat.	Subject Code	Title	Teaching Hours Per Weak			Credit s	Examination		
				L	T	P/ D		I.A Marks	ESE Marks	Total Marks
1	PE	AU-804	Industrial Safety	3	0	0	3	40	60	100
2	PE	AU-805	Vehicles Design And Data Characteristics	3	0	0	3	40	60	100
3	PE	AU-806	Precision Engineering	3	0	0	3	40	60	100

Note: Industrial Project of Four months duration is to be carried out by the student exclusively in industry under the joint supervision of faculty advisers from institution as well as from the industry.



SEMESTER III



MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties - Function of Random variables.

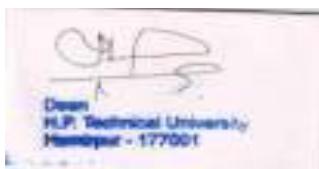
UNIT – III

Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

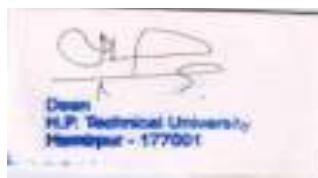


Text Books:

1. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
2. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
3. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers", 5th Edition, 2011.

Reference books:

1. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearson Education, Delhi, 2002.
2. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
3. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists" 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics - Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

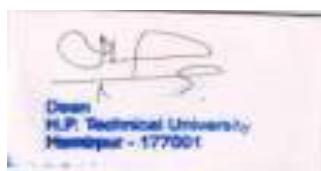
UNIT - II

Value Analysis - Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management; organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.



Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages,incentives, recruitment, training and industrial relations.

UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet, break evenanalysis - basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketingenvironment, marketing mix, advertising and sales promotion.

Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

Text Books:

15. PanneerSelvam, R, “*Engineering Economics*”, Prentice Hall of India Ltd, New Delhi.

16. Dwivedi, D.N., “*Managerial Economics, 7/E*”, Vikas Publishing House.

Reference Books:

71. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., “*Engg. Economy 15/E*”,Prentice Hall, New York, 2011.
72. Chan S. Park, “*Contemporary Engineering Economics*”, Prentice Hall of India, 2002.
73. F. Mazda, *Engg.Management*, Addison Wesley, Longman Ltd., 1998.
74. O. P. Khanna, *Industrial Engg.and Management*,DhanpatRai and Sons, Delhi, 2003.
75. P. Kotler, *Marketing Management, Analysis, Planning, Implementation and Control*,Prentice Hall, New Jersey, 2001.
76. VenkataRatnam C.S & Srivastva B.K,*Personnel Management and Human Resources*, Tata McGraw Hill.
77. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill.
78. Bhattacharya A.K., *Principles and Practice of Cost Accounting*, Wheeler Publishing.
79. Weist and Levy, *A Management guide to PERT and CPM*, Prantice Hall of India.
80. Koontz H.,O'Donnell C.,&Weihrich H, *Essentials of Management*, McGraw Hill.



AU-301 ELEMENTS OF AUTOMOBILE ENGINEERING

Teaching Scheme			Credits	Marks			Duration	End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total		
3	1	0	4	40	60	100	3 hrs	

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction to Automobiles: Classification, Components, Requirements of Automobile Body: Vehicle Frame. Types; Front Engine Rear Drive & Front Engine Front Drive Vehicles, Four Wheel Drive Vehicles.

Clutches: Introduction to clutches, requirement of Clutches – Principle of Friction Clutch –Wet Type & Dry Types: Single Plate Clutch, Multi plate Clutch, Centrifugal Clutches, Clutch linkages.

UNIT-II

Power Transmission: Object of the Gear Box; Different types of Gear Boxes; Sliding Mesh, onstant Mesh, Synchromesh Gear Boxes; Drive Lines, Universal Joint, Propeller Shaft, Slip Joint; Front heel drive; Principle, Function, Construction & Operation of Differential; Rear Axles, Types of load coming on Rear Axles, Full Floating, Three Quarter Floating and Semi Floating Rear Axles.

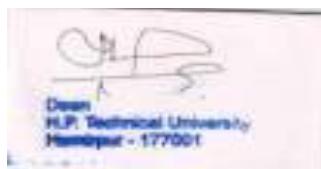
Suspension Systems: Need of Suspension Systems, Types of Suspension; factors influencing ride comfort, leaf springs, shock absorber.

Steering System: Front Wheel geometry & Wheel alignment viz. Caster, Camber, King Pin Inclination, Toe-in/Toe-out; Conditions for true rolling motions of Wheels during steering: Different type of Steering Gear Boxes; Steering linkages and layout; Rack & Pinion Power Steering Gear.

UNIT-III

Automotive Brakes, Tyres & Wheels: Classification of Brakes; Principle andconstruction details of Drum Brakes, Disc Brakes; Mechanical, Hydraulic, Pneumatic Brakes; Power Assisted Brakes; Tyres of Wheels; Types of tyre & their constructional details, Tyre rotation; Excessive Tyre wear & their causes.

Automotive Electricals: Purpose & Operation of lead acid Battery, capacity rating. Purpose and Operations of the Starting System; and charging system.

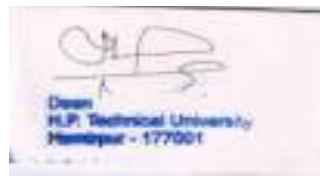


Text Books:

1. Automobile Engineering (Vol. 1 & Vol. 2) by Dr. Kirpal Singh, Standard Publishers Distributors.
2. Automobile Engineering by Anil Chhikara, Satya Prakashan, New Delhi.

Reference Books:

1. Automotive Mechanics – Crouse & Anglin, Tata McGraw Hill.
2. Automotive Technology – H.M.Sethi, Tata McGraw Hill.
3. Automotive Mechanics – S.Srinivasan, Tata McGraw Hill.
4. Automotive Mechanics – Joseph Heitner, EWP.
5. Motor Automotive Technology by Anthony E. Schwaller – Delmer Publishers. Inc.
6. The Motor Vehicle – Newton steeds Garrett, Butterw



ME-301: STRENGTH OF MATERIALS-I

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semesteter	Total	
3	1	0	4	40	60	10	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

Unit-I

Simple Stresses and Strains: Stress & Strain, Types of stresses and strains, elastic limit, Hooke's law, Stress-Strain diagram for ductile and brittle, Factor of Safety, Poisson's ratio, Elastic constants, Young's Modulus, Shear Modulus, and Bulk Modulus, Relationship between elastic constants. Introduction to thermal stresses and strains.

Compound stresses & strains: Concept of surface and volumetric strains, two –dimensional stress system, complementary shear stresses at a point on a plane. Principal stresses & strains and principal planes. Mohr's circle of stresses, Numerical problems.

Unit-II

Bending Stresses in Beams: Bending stresses in Beams with derivation of Bending equation and its application to beams of circular, rectangular, I & T sections, Composite Beams.

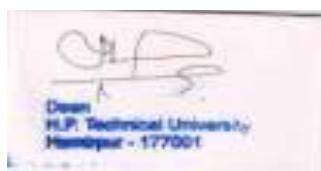
Torsion of Circular Shaft: Theory of Pure Torsion, Derivation of Torsion equation for a circular shaft subjected to torsion, assumptions, derivation of maximum torque transmitted by a solid shaft, and hollow shaft.

Unit-III

Shear and combined stresses in beams: Shear stresses in beams with derivation of shear stress in rectangular I, T, circular and hollow circular sections. Combined bending, torsion & axial loading of beams. Numerical problems.

Slope & Deflection: Relationship between bending moment, slope & deflection, Method of integration, Macaulay's method, Mohr's theorem-moment area method, .. Calculations for slope & deflection of (1) cantilevers and (2) simply supported beams with or without overhang, under concentrated loads, uniformly distributed loads, uniformly distributed loads, or combination of any two or all of these types of loads. Numerical problems.

Unit-IV



Theories of Elastic Failure: Various theories of elastic failure with derivations and graphical representations, applications to problems of two-dimensional stress systems with (i) Combined direct loading and bending and (ii) combined torsional and direct loading. Numerical problems.

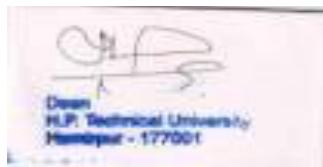
Strain Energy & Impact Loading: Definitions, expressions for strain energy stored in a body when load is applied (i) gradually, (ii) suddenly and (iii) with impact. Strain energy of beams in bending, beam deflections. Strain energy of shafts in twisting. Energy methods in determining spring deflection, Castiglano's & Maxwell's theorems, Numerical problems.

Textbooks :

4. Mechanics of Materials-Vol.-1, & Vol. 2, E.J. Hearn, Elsevier Publications.
5. Strengths of Materials – R.K. Rajput, S.Chand & Sons.
6. Strength of Materials- R.K. Bansal, Laxmi Publications.

Reference Books:

5. Mechanics of Materials-R.C.Hibbeler, Pearson India.
6. Mechanics of Solids-James Goodno, Thomson Publishers.
7. Strength of Materials-Popov , PHI, New Delhi.
8. Strength of Materials-G.H. Ryder- Third Edition in S.I. units 1969 Macmillan India.



ME 303: ENGINEERING THERMODYNAMICS

Teaching Scheme		Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semester	Total
3	0	0	3	40	60	100
						3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

UNIT-I

Introduction and Basic Concepts: Application areas of thermodynamics, Systems and Control volumes, Properties of system, Continuum, State and equilibrium, Processes and cycles, Temperature and Zeroth law of thermodynamics, Heat and thermodynamic, concept of work.

First Law of Thermodynamics: Statement, Heat and work calculations, Application of first law to non-flow and flow systems, steady flow energy equation as applied to boiler, condenser, throttle, nozzle and turbine

UNIT-II

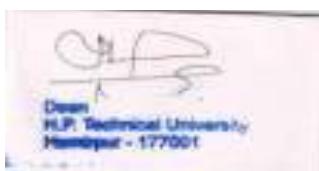
Second Law of Thermodynamics: Statements and their equivalence, thermal energy reservoirs, concept of heat engine, refrigerator, heat pump and perpetual motion machines, Carnot cycle and principles.

Entropy: Concept of entropy, Temperature- entropy plot, Clausius inequality theorem, Principle of Increase of entropy, entropy balance, entropy generation in daily life, first and second law combined, entropy changes of an ideal gas during reversible processes, Available and unavailable energy, Irreversibility, second law efficiency

UNIT-III

Property Relations: Introduction to Maxwell relations, Clausius-Clapeyron equation, volume expansivity and isothermal compressibility, Mayer relation, Joule-Thomson coefficient.

Properties of Steam: Dryness fraction, enthalpy, internal energy and entropy, steam table, polynomial form of steam equations and Mollier chart, First law applied to steam processes



UNIT-IV

Power Cycles: Vapor power Cycles: Carnot vapour cycle, Rankine cycle, Ideal reheat Rankine cycle, Introduction to co-generation. Gas Power Cycles: Air standard assumptions, Otto cycle, Diesel cycle, dual cycle, Stirling cycle, Ericsson cycle, Brayton cycle

Reactive Systems: Combustion, theoretical and actual combustion processes, enthalpy of formation and enthalpy of combustion, adiabatic flame temperature, first law analysis of reactive system

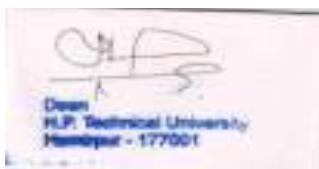
Text Books

3. Thermodynamics by P K Nag, TMH, 5TH Edition
4. Fundamentals of Classical Thermodynamics by Van Wylen G.H. & Sonntag R.E., John Wiley & Sons.

Reference Books:

8. Thermodynamics: An Engineering Approach by Yunus A. Cengel and Michael A Boles, 7e, TMH.
9. Thermodynamics and Heat Engines by R Yadav, Central Publishing house.
10. Holman, J.P. Thermodynamics. McGraw- Hill
11. Thermal Engineering by Mahesh Rathod, McGrawHill Publications
12. Engineering Thermodynamics- A Generalized Approach by P L Dhar, ELSEVIER
13. Fundamentals of Thermodynamics by Moran & Shapiro.

Schaum's Outlines: Thermodynamics for Engineers by Merle C. Potter



ME 304: MACHINE DRAWING

Teaching Scheme			Credit C	Marks			Duration of End semester Examination
L	T	P/D		Sessional	End Semester	Total	
2	0	3	3	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

UNIT-I

Introduction: Introduction to BIS Specification sp: 46- 1988 Code of engineering drawing – Limits. Fits and Tolerance (dimensional and Geometrical tolerance), Surface finish representation.

UNIT-II

Gear: Gear terminology. I.S convention of assembly of spur gears, helical gear, bevel gears, worm and worm wheel.

Fasteners: Drawings of various views of Screw threads, metric and BSW threads, Square thread and multi start threads. Nut bolts, Washers, Setscrew, Locknuts and foundation bolts.

UNIT-III

Orthographic view: Orthographic view from isometric views of machine parts / components. Dimensioning- Sectioning. Exercises on coupling, crankshaft, pulley, piston and connecting rod, cotter and knuckle joints. Riveted joints and Welded joints.

UNIT-IV

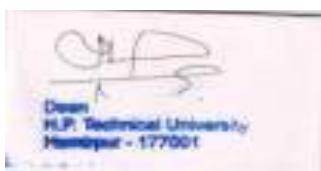
Assembly drawing: Assembly drawings with sectioning and bill of materials from given detail drawings of assemblies: Lathe tail stock, machine vice, pedestal bearing, Steam stop valve, drill jigs and milling fixture.

Text Books:

- Machine Drawing: N D Bhat and V M Panchal, Pub: Charotar Publishing House.
- A text book of machine drawing: PS Gill, Pub: S.K.Kataria& Sons.

Reference Books:

- A text books of machine Drawing: Laxminarayana and Mathur, Pub: M/S Jain Brother. New Delhi.
- Machine Drawing: N Sidheshwar, P Kannaieh, V S Sastry, Pub: Tata McGraw Hill.



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT- I

Introduction to sociological concepts - structure, system, organization, social institution, Culture social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT –II

Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

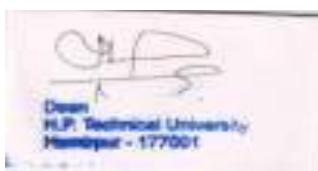
UNIT –III

Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.

UNIT - IV

From feudalism to colonialism -the coming of British; Modernity and struggle for independence.



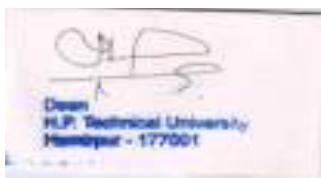
**Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India
2ndphase (LPG decade post 1991)**

Text Books:

4. Desai, A.R. (2005), Social Background of Indian Nationalism, Popular Prakashan.
5. Giddens, A (2009), Sociology, Polity, 6thEdition.
6. Chandoke, Neera& Praveen Priyadarshi(2009), contemporary India: Economy, Society and Politics, Pearson.

Reference Books:

5. Guha, Ramachandra(2007), India After Gandhi, Pan Macmillan.
6. Haralambos M, RM Heald, M Holborn (2000), Sociology, Collins.
7. Sharma R. S..(1965), Indian feudalism, Macmillan.
8. Gadgil, Madhab&RamchandraGuha(1999) - This Fissured Land: An Ecological History of India, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßige Verben im Präsens - "sein" und haben im Präsens - Personalpronomen im Nominativ.

UNIT- II

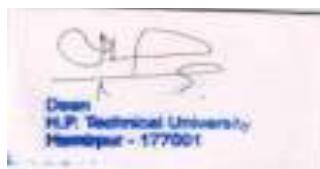
WichtigeSprachhandlungen: TelefonNummernverstehen und sprechen Uhrzeitenverstehen und sagen Verneinung "nicht und kein" (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notieren bestimmt und unbestimmter Artikel und Negativartikel im Nom. & Akkusativ

UNIT- III

WichtigeSprachhandlungen: Tageszeitenverstehen und überTermine sprechen- Verabredungen verstehen - Aufgaben im Haushalt verstehen

Grammatik: Personalpronomen im Akkusativ und Dativ - W-Fragen "wie, wer, wohin, wo, was usw.- Genitiv bei Personennamen - Modalverben im Präsens "können, müssen, möchten"



UNIT- IV

WichtigeSprachhandlungen:Sichaustauschen, was man kann, muss –BezeichnungenLebensmittel – Mengenangabenverstehen – PreiseverstehenundEinkaufzettelschreiben

Grammatik:Wortstellung in SätzenmitModalverben – Konnektor ”und” – “noch”-kein-----mehr – “wieviel, wieviele, wie alt, wie lange” –PossessivartikelimNominativ.

UNIT V

WichtigeSprachhandlungen:Freizeitanzeigenverstehen

HobbysundSportartenAnzeigenfürFreizeitpartnerschreibenbzw. daraufantworten –Vorlieben und Abneigungenausdrucken

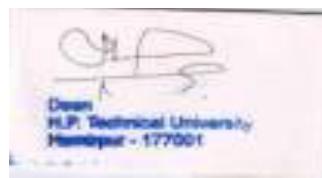
Grammatik:VerbenmitVokalwechselimPräsens – ModalverbenimPräsens“dürfen, wollen und mögen - “haben und sein” imPräteritum – regelmäßigeVerbenimPerfekt – Konnektoren “denn, oder, aber.

TEXT BOOK

1. Studio d A1. Deutsch alsFremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verbof self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the Frenchalphabet and the accents that play a vital role in the pronunciation of the words.

Writing:Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subjectpronouns.

Listening and Speaking: Pronunciation of words like Isabelle, presentezandla liaison – vousetes, vousappelez and role play of introducing each other –group activity.

Writing:Particulars in filling an enrolment / registration form.

Reading Comprehension: reading a text of a famous scientist and answeringquestions.

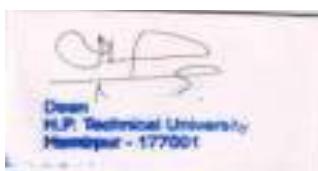
UNIT – III

Grammar and Vocabulary:Verb of possession “avoir’ and 1st group verbs“er”, possessive adjectives and pronouns of insistence- moi, lui..andnumbers from 0 to 20.

Listening and Speaking: Nasal sounds of the words like feminine, ceinture,parfum and how to ask simple questions on one’s name, age, nationality,address mail id and telephone number.

Writing:Conjugations of first group verbs and paragraph writing on self –introduction and introducing a third person.

Reading Comprehension: reading a text that speaks of one’s profile andanswering questions



UNIT – IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb “aimer” and seasons of the year and leisure activities.

Listening and Speaking: To express one’s likes and dislikes and to talk of one’s pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing: Conjugations of the irregular verbs: faire and savoir and their usage. Paragraph writing on one’s leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one’s way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs, a droite, la premiere a gauche and vocabulary relating to accommodation.

Listening and Speaking: To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing: Paragraph writing describing the accommodation using the different prepositions like en face de, derriere- to locate.

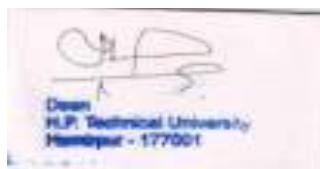
Reading Comprehension: A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliotheque?.....

TEXT BOOK

1. Tech French

REFERENCES

1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



ME-305 STRENGTH OF MATERIALS – LAB.

Teaching Scheme			Credits	Marks			Duration Semester Examination	End
L	T	P/D	C	I.A.	ESE	Total		
0	0	2	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF EXPERIMENTS:

14. To study the Brinell and Rockwell hardness testing machine & compare hardness of atleast two types of materials/alloys,
15. To study the Vickers hardness testing machine & perform Vickers hardness test& compare hardness of atleast two types of materials/alloys,
16. To study the Impact Testing Machine and perform the Impact tests (Izod&Charpy),
17. To study the Universal testing machine and perform the tensile test for comparing graphs of atleast two types of materials/alloys,
18. To perform compression test on UTM,
19. To perform bending/shear test on UTM,
20. To perform the torsion test on mild steel/aluminium alloy,
21. To perform fatigue test on mild steel/aluminium alloy,
22. To find Young’s Modulus of a beam (rectangular/triangular/circular section) using deflection of beam apparatus,
23. To find Modulus of Rigidity of a specimen using Searl’s Apparatus



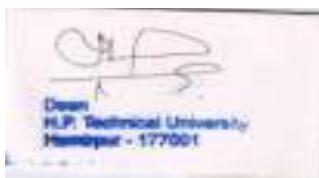
AU-302 ELEMENTS OF AUTOMOBILE ENGINEERING LAB

Teaching Scheme			Credits	Marks			Duration	End Semester Examination
L	T	P/D	C	I.A.	ESE	Total		
0	0	2	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF PRACTICALS/EXPERIMENTS:

1. To study and prepare report on the constructional details, working principle and operation of the following
(a) Single plate clutch. (b) Multi plate clutch.
2. To study and prepare report on the constructional details, working principles and operation of the following
(a) Constant mesh Gear Box. (b) Synchromesh Gear Box.
3. To study and prepare report on the constructional details, working principles and operation of the following
(a) Rear Wheel Drive Line. (b) Front Wheel Drive Line. (c) Differentials
4. To study and prepare report on the constructional details, working principles and operation of the following
(a) Starting System. (b) Ignition System.
5. To study and prepare report on the constructional details, working principles and operation of the Charging System.
6. To study and prepare report on the constructional details, working principles and operation of the following
(a) Front Suspension System. (b) Rear Suspension System.
7. To study and prepare report on the constructional details, working principles and operation of Rack and Pinion Power steering system.
8. Adjusting of brake shoes and bleeding the hydraulic brake system.



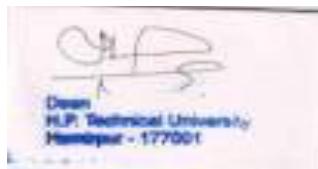
ME307: COMPUTER AIDED DESIGN (CAD) LAB-I

Teaching Scheme			Credits	Marks			Duration Semester	End Examination
L	T	P/D	C	I.A.	ESE	Total		
0	0	3	1	30	20	50	3 hrs	

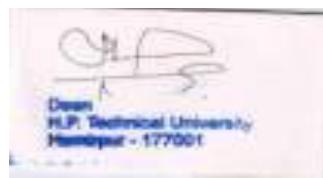
Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF EXPERIMENTS:

1. Setting up of drawing environment by setting drawing limits, drawing units, naming the drawing naming layers, setting line types for different layers using various type of lines in Engineering drawing, saving the file with dwg. extension.
2. Layout drawing of a building using different layer and line colors indicating all Building details name the details using text commands, Make a title Block.
3. To Draw Orthographic projection drawings (Front, Top and side) of boiler safety valve giving name the components of the valve.
4. Make an Isometric dimensioned drawing of a connecting Rod using Isometric grid and snap.
5. Draw quarter sectional isometric view of a cotter joint.
6. Draw different types of bolts and nuts with internal and external threading in Acme and square threading standards. Save the bolts and nuts as blocks suitable for insertion.
7. Draw a 3D model of a machine component using 3D primitives and using commands like Union, Subtraction, Revolve, Slice, Rotate 3D etc. Calculate surface Area, Mass, Centre of Gravity and Mass moment of inertia using inquiry commands render the figure made and attach a material to the figure.
8. Draw 3D model of protected type flange coupling.
9. Draw a spiral by extruding a circle.
10. Draw an assembly of Jigs & Fixture in 3D.



SEMESTER IV



MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

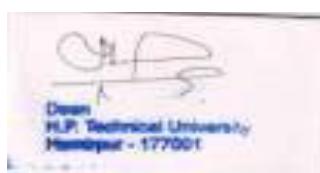
UNIT – II

Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.

UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.



Approximation methods for nonlinear programming: Line search methods, gradientmethods, conjugate gradient methods; Networkingtechniques – PERT and CPM.

UNIT - IV

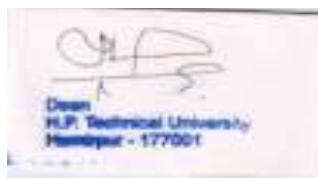
Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and it's role in minimization, minimization under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

29. C. B. Gupta, "Optimization Techniques in Operation Research," I. K. International Publishing House Pvt. Ltd.
30. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
31. Mukesh Kumar Singh, "Calculus Of Variations" Krishna Prakashan Media (P) Ltd.
32. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

36. I. M.Gelf and S. V. Fomin, "Calculus of Variations" Dover Publications IncMineola,New York.
37. Purna Chand Biswal, "Optimization in Engineering, Scitech Publications India Pvt. Ltd.
38. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
39. G. Hadly, Linear Programming, Narosa Publishing House.
40. KantiSwarup, P. K. Gupta and Manmohan, "Operations Research," Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

11. Understanding the need , basic guidelines, content and process of value Education
12. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

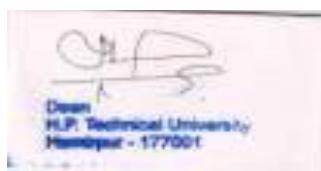
21. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
22. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
23. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
24. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

16. Understanding human being as a co-existence of the self and the body.
17. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
18. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

11. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
12. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.



UNIT V: Harmony in Family, Society and Nature

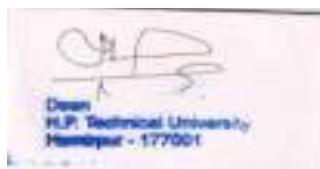
16. Understanding harmony in the family, society and nature.
17. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.
18. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

11. R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).
12. R R Gaur, R Sangal and G P Bagaria, Teacher's Manual (English), 2009.

Reference Books

31. E.F. Schumacher, Small is Beautiful; a study of economics as if people mattered, Blond & Briggs, Bratain, 1973.
32. PL Dhar, RR Gaur, Science and Humanism, common wealth publishers, 1990.
33. A.N. Tripathy, Human values, New Age International Publishers, 2003.
34. E.G. Seebauer& Robert, L BERRY, Foundational of Ethics for Scientists &Engineers, Oxford University Press, 2000.
35. M. Govindrajan, S.Natrajan& V.S. Senthil Kumar, Engineering Ethics (including human Values), Eastern Economy Edition, Prentice hall of India Ltd.
36. B.L. Bajpai, 2004, Indian Ethos and Modern Management, New Royal book Co; Lucknow, 2004, Reprinted 2008.



AU-401 AUTO FUEL AND LUBRICANTS

Teaching Scheme			Credits	Marks			Duration	End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total		
3	0	0	3	40	60	100	3 hrs	

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

MANUFACTURE OF FUELS AND LUBRICANTS

Structure of petroleum refining process, classification of petroleum fuels, thermal cracking, catalytic cracking, polymerization, alkylation, isomerisation, blending, products of refining process. Manufacture of lubricating oil base stocks, manufacture of finished automotive lubricants.

PROPERTIES & TESTING OF FUELS

Thermo-chemistry of fuels, properties and testing of fuels & Lubricants, relative density, calorific value, fire point, distillation, vapor pressure, flash point, spontaneous ignition temperature, viscosity, pour point, flammability, ignitability, diesel index, API gravity, aniline point, Viscosity index etc.

UNIT-II

Fuel rating & additives Cetane rating, fuel requirements. Additive - mechanism, requirements of an additive, petrol fuel additives and diesel fuel additives - specifications of fuels. COMBUSTION SI Engine - name propagation and mechanism of combustion, normal combustion, knocking, octane, rating. Fuel requirements. CI engine, mechanism of combustion, diesel knock.

UNIT-III

ALTERNATE FUELS

Use of alternate fuel in engines- LPG, CNG need for alternate fuels, availability & their properties, general use of alcohols, LPG, CNG, LNG, hydrogen, ammonia, vegetable oils, bio-diesel & biogas, merits & demerits of alternate fuels. Introduction to alternate energy sources like, electric vehicle, hybrid, fuel cell & solar cars.

LUBRICANTS

Classification of lubricating oils, properties of lubricating oils, tests on lubricants. Grease classification, properties, test. Specific requirements for automotive lubricants, oxidation, deterioration and degradation of lubricants, additives, synthetic lubricants.



UNIT-IV

THEORY OF LUBRICANTS

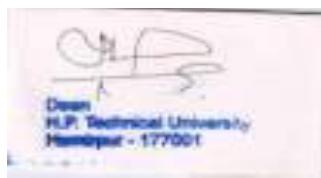
Engine friction - introduction, total engine friction, effect of engine variables on friction, hydrodynamic lubrication, elasto hydrodynamic lubrication, boundary lubrication, bearing lubrication, functions of the lubrication system, introduction to design of a lubricating system.

TEXT BOOKS

1. Internal Combustion Engineering by Ganesan V. TaU McGraw -Hill Publishing Co .. New, Delhi.
2. Lubrication. Raymond G. Gunther, Chipton Book Co., 1971.

REFERENCE BOOKS

1. Fuels - Solids. Liquids. Gaseous by Brame. J.S.S. and King. I.G.
2. Fuels and Fuel Technology by Francis, W, Vol. I & II
3. Modern Petroleum Technology by Hobson, G.D. & Pohl. W
4. Lubrication-A practical guide to lubricant selection by A.R. Lansdown



AU-402 FLUID MECHANICS AND FLUID MACHINES

Teaching Scheme			Credits	Marks			Duration	End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total		
3	1	0	4	40	60	100	3 hrs	

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction: Fluid and flow-definition and types, properties of ideal and real fluids, continuum concept, Lagrangian & Eulerian approach.

Fluid Statics: General differential equation, manometry, Force on plane and curved surfaces, stability of floating and submerged bodies, Relative equilibrium.

UNIT-II

Kinematics of fluid: Steady flow, uniform flow, stream, streak and path lines, continuity equation, stream function, irrotational flow, velocity potential, flow nets, circulation, simple flows, flow around circular cylinder with and without rotation, lift and drag.

Dynamics of fluids: Concept of system and control volume, Reynold's transportation theorem, Euler's equation, Bernoulli's equation, Navier Stoke's equation and their application to nozzle, venturimeter, orifices and mouth pieces, time taken in emptying a vessel. Pitot - Prandtl tube.

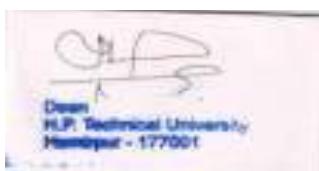
UNIT-III

Laminar flow of viscous fluids: Boundary layer concept, boundary layer thickness, displacement, momentum and energy thickness, integral method, drag on flat plate, flow around an airfoil, boundary layer separation.

Flow in pipes: Laminar flow through pipe, total and hydraulic gradient lines, series and parallel connection of pipes, transmission of power through pipes.. Turbulent flow: Fluid friction and Reynolds number.

UNIT-IV

Centrifugal Pumps: Classification, velocity vector diagrams and work done, hydraulic and manometric efficiency, vane shape, head capacity relationship and pump losses, pressure rise in impeller, minimum starting speed, multi-stage pumps, Similarity relations and specific speed, net positive suction head, cavitation and maximum suction lift, performance characteristics.



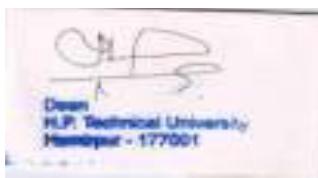
Reciprocating Pumps: Construction and operational details, discharge coefficient, volumetric efficiency and slip, work and power input, effect of acceleration and friction on indicator diagram (pressure – stroke length plot) air vessels and their utility. Centrifugal vs. reciprocating pumps.

Text Books:

1. Modi and Seth, Fluid Mechanics and Hydraulic Machines, CBS Publishers.
2. Munson, Young, Okiishi and Huebsch, Fundamentals of Fluid Mechanics, Wiley India (6th Edition).
3. R.K. Bansal, A Text Book of Fluid Mechanics and Hydraulic Machines, Laxmi Publications (P) Ltd., New Delhi

Reference Books:

1. White F.M., Fluid Mechanics, Tata McGraw Hill.
2. Douglas, Gasiorek, Swaffield and Jack, Fluid Mechanics, Pearson (5th Edition).
3. Som, S.K. and Biswas, G., Introduction to Fluid Mechanics and Fluid Machines, Tata Mc- Graw Hill.
4. Bansal, R.K., Text Book of Fluid Mechanics and Hydraulic Machines, Laxmi Publications (P) Ltd.
5. Agarwal, Fluid Mechanics and Machinery, Tata McGra



ME 402: STRENGTH OF MATERIALS-II

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D		Sessional	End Semester	Total	
3	1	0	4	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

Unit-I

Thin Walled Vessels: Derivation of Hoop & Longitudinal stresses & strains in cylindrical & spherical vessels under internal pressure. Change in volume of vessel under pressure, Numerical problems.

Thick Cylinders & Spheres: Derivation of equations for radial & hoop stresses and strains in thick cylinders and spherical shells. Compound cylinders and spherical shells subjected to internal fluid pressure only, hub shrunk on solid shaft. Wire-wound cylinders. Numerical problems.

Unit-II

Rotating Rims, Discs & Cylinders: Stresses and strains in (i) rotating rims, neglecting the effect of spokes, (ii) rotating discs, including disc of uniform strength and disc shrunk on hub (iii) rotating cylinders (solid & hollow). Numerical problems.

Unit-III

Columns & Struts: Columns under axial load, concept of instability and buckling, slenderness ratio. Derivation of Euler's formulae for the elastic buckling load. Euler's, Rankine Gordon's formulae, Johnson's empirical formula for axial loading of columns and their applications, eccentric compression of a short strut of rectangular & circular sections, Numerical problems.

Springs: Stresses in closed and open coiled helical springs subjected to axial loads and twisting couples. Leaf springs, flat spiral springs. Numerical Problems.

Unit-IV

Bending of Curved Bars: Stresses in bars of initial large radius of curvature, bars of initial small radius of curvature. Stresses in crane hooks, rings and chain links of circular & trapezoidal sections. Numerical Problems.

Unsymmetrical bending: Introduction to unsymmetrical bending, Shear Center, Numerical problems.

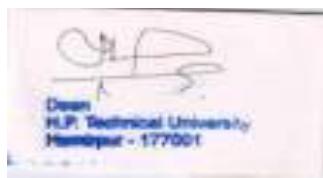


Textbooks :

4. Mechanics of Materials-Vol.-1, & Vol. 2, E.J. Hearn, Elsevier Publications.
5. Strengths of Materials – R.K. Rajput, S.Chand& Sons.
6. Strength of Materials- R.K. Bansal, Laxmi Publications.

Reference Books:

5. Mechanics of Materials-R.C.Hibbeler, Pearson India (9th Edition).
6. Mechanics of Solids-James Goodno, Thomson Publishers.
7. Strength of Materials-Popov , PHI, New Delhi.
8. Strength of Materials-G.H. Ryder- Third Edition in S.I. units 1969 Macmillan India.



ME403:I.C.ENGINES

Teaching Scheme			Credit	Marks			Duration of End semester Examination
L	T	P/D	C	Sessional	End Semester	Total	
3	0	0	3	40	60	100	3Hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 Marks. Apart from this, the paper setter will set question No.9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type question and shall be of 20 Marks.

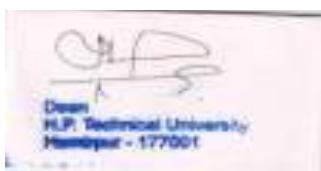
UNIT-I

Introduction Heat engines; Internal and external combustion engines; Classification of I.C. Engines; Cycle of operations in four strokes and two-stroke IC engines and their comparative study; Fuels: SI and CI engine fuels, Rating of fuels, Scavenging and scavenging blowers, Air standard cycles and Fuel air cycles, Variable specific heat and its effects, Dissociation and other losses, Actual cycles, Deviation of actual engine cycle from ideal cycle, TDC, BDC, Torque, Power.

Compression Ignition Engines Combustion phenomenon in C I engines, Stages of combustion, Delay period, Knocking, Pressure-Crank angle diagram, Factors affecting combustion and knocking, Types of combustion chambers. **Spark Ignition Engines** Combustion: Combustion phenomenon in SI Engines, Ignition delay, Flame propagation, Pressure-Crank angle diagram, Abnormal combustion, Auto ignition, Detonation and Knocking, Factors affecting combustion and detonation, Types of combustion chambers

UNIT-II

Fuel System – SI Engines: Theory of carburetion, Simple carburettor, Essential parts of modern carburettor, Types of carburettors, Types of fuel injection systems in SI engines, Continuous injection system, Timed injection system, Electronic Fuel Injection systems (EFIs)/MPFi, Working of Sensors, Functions of ECU in Petrol Engine. Spark Plug and its requirements, Battery, Magneto, Electronic ignition systems. GDI Technology, Turbo in Petrol Engines.



Fuel System – CI Engines: Fuel Injection Systems:Unit Pump, Inline Pump, Rotary Pump, Engine Governors: necessity and characteristics, Types of nozzle, Electronic Diesel Control, CRDi Technology, System Layout, Function of ECU in diesel engine, Working of Sensors, Turbocharger and its types, VGT, Twin-turbo.

UNIT-III

Engine lubrication: Types of lubricants and their properties, SAE rating of lubricants, Types of lubrication systems, **Engine Cooling:** Necessity of engine cooling, disadvantages of overcooling, Cooling systems and their comparison: Air cooling, Liquid cooling, **Supercharging/Turbo-charging:** Objectives, Effects on power output and engine efficiency

Engine Testing and Performance: Measurement of Break Horse Power, Indicated Power, Fuel Consumption, Air flow, BMEP, Performance characteristic of SI and CI Engines, Effect of load and Speed on mechanical, indicated thermal, break thermal and volumetric efficiencies, Heat balance sheet

UNIT-IV

After-treatment technologies: -Working of Catalytic Converter & its types, SCR, DPF, DOC, POC, LNT.**Exhaust Emissions:**Homologation, Emission Standards, Applicable Standards in India, Future Norms, and Significance of Fuel in meeting emissions. Classification of Segments, Emission Test Cycles, COP, Emission Measurement Techniques, On board Diagnosis, OBDI, OBDII.

Alternate Fuels: Alcohol - Hydrogen - Natural Gas and Liquefied Petroleum Gas – Biodiesel- Biogas Properties - Suitability - Engine Modifications - Merits and Demerits as fuels.

Text Books

3. Ganesan V., (1999), Internal Combustion Engines, Tata McGraw Hill.
4. John B. Heywood, (2000), Internal Combustion Engine Fundamentals, McGraw Hill.

Reference Books

5. Rowland S.Benson and N.D.Whitehouse, (2000) Internal combustion Engines, Vol. I and II, Pergamon Press.
6. Colin R.Feriguson, and Allan.T.Kirkpatrick, (2000), I.C.engines Applied Thermosciences
7. Richard.L.Bechfold, Alternative Fuels Guide Book, SAEInternational Warrendale,1997.
8. “Alcohols as motor fuels progress in technology” - Series No.19 - SAE Publication USE - 1980.
- 5.Heisler Heinz, Advanced Engine Technology, Hodder & Stoughton Ltd



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - Golak Nath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

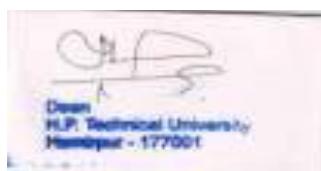
UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.

UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial



review of administrative actions, exclusion of judicial review and concept of “Ombudsman”; Right to Information Act, 2005 (Sub Section 1 - 20)

Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

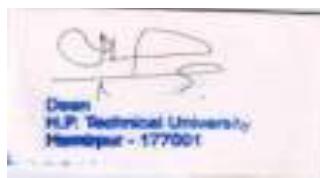
Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

22. D.D. Basu, Shorter Constitution of India, Prentice Hall of India, (1996)
23. MeenaRao, Fundamental concepts in Law of Contract, 3rd Edn. Professional Offset, (2006)
24. H.O.Agarwal, International Law and Human Rights, Central Law Publications, (2008)

Reference Books:

36. H.M. Seervai, Constitutional Law of India, Tripathi Publications, (1993).
37. S.K. Kapur, Human Rights under International Law and Indian Law, Central Law Agency, (2001)
38. NeelimaChandiramani, The Law of Contract: An Outline, 2nd Edn. Avinash Publications Mum, (2000)
39. Avtarsingh, Law of Contract, Eastern Book Co., (2002).
40. Anson W.R.(1979), Law of Contract, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verbenmituntrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

Wichtige Sprachhandlungen: Kleidung , Farben, Materialien.

Grammatik: formelle Imperativsätze mit “Sie” informelle Imperativsätze Vorschläge mit “wir” – “sollen/wollen wir” - Sollich? Modalpartikeln “doch” “mal” “doch mal”.

UNIT - III

Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ “alle”, “man” Indefinitepronomen “etwas”, “nichts”.



UNIT - IV

WichtigeSprachhandlungen: Essen und TrinkenimRestaurant,Partyvorbereitung und Feier.

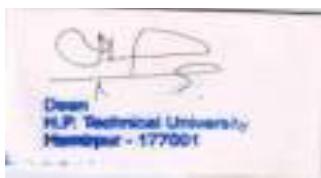
Grammatik: NomenausAdjektivennach “etwas”und “nichts” NomenausdemInfinitiv von Verben, zusammegesetzteNomen und ihreArtikel. AdjektiveimNom.undAkk.nachunbestimmtenArtikel, Negativartikel und Possessivartikel.

TEXT BOOK

8. Studio d A1. Deutsch alsFremdsprache with CD.(KursbuchundSprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

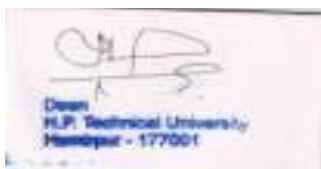
Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.



UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.

UNIT - IV

Grammar and Vocabulary – the verbs: manger, boire, the partitive articles

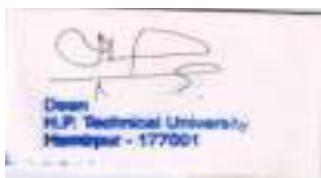
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading – reading a text.

TEXT BOOK

8. Tech French

REFERENCES

1. French for Dummies.
2. French made easy: Goyal publishers.
3. Panorama.



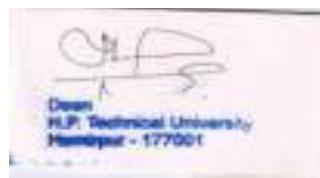
ME-405: I.C. ENGINE LAB

Teaching Scheme			Credits	Marks			Duration	End Semester
L	T	P/D	C	I.A.	ESE	Total	Examination	
0	0	2	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

9. To study the construction details of 2 Stroke and 4 Stroke Engines.
10. To study the valve timing diagram of engine. (4 stroke petrol/diesel engine)
11. To perform Morse Test on engine(4 stroke petrol/diesel engine)
12. To perform Speed Test on engine (4 stroke petrol/diesel engine)
13. To perform Load Test(Rope Brake/Eddy Current/hydraulic dynamometer) on engine (4 stroke petrol/diesel engine)
14. To perform Heat Balance test on engine (4 stroke petrol/diesel engine)
15. To perform experimental determination of Air fuel ratio and volumetric efficiency of the engine (4 stroke petrol/diesel engine)
16. To study the effects of Supercharging/turbo charging on Performance Characteristics of an engine (4 stroke petrol/diesel engine)
10. To study the difference between Carburetors based fuel system & EFI.
11. To study the difference between Inline Pump, Rotary Pump &CRDi System for a four cylinder diesel engine.
24. To study the effect of Injection Timing & Pressure on Single Cylinder Diesel Engine using Open ECU & perform Exhaust Gas/Smoke analysis of engine.
25. To study the effect of Spark Timing & Lambda on Single Cylinder Petrol Engine using Open ECU & perform Exhaust Gas/Smoke analysis of engine.
26. To study the construction details of Ignition system (Battery, Magneto, Electronic).



AU-403: AUTO FUEL AND LUBRICANTS LAB.

Teaching Scheme			Credits	Marks			Duration	End Semester Examination
L	T	P/D	C	I.A.	ESE	Total		
0	0	2	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF PRACTICALS/EXPERIMENTS:

1. Temperature dependence of viscosity of lubrication oil by Redwood Viscometer.
2. Viscosity Index of lubricating oil by Saybott Viscometer.
3. Flash and Fire points of Diesel, K-Oil, Bio Diesel.
4. Flash and Fire points of lubricants.
5. Drop point of grease and mechanical penetration in grease
6. Calorific value of liquid fuel.
7. Calorific value of gaseous fuel
8. Study of semi solid lubrication in various Automobile Unit & Joints
9. Study of lubrication in transmission, final drive, steering gearbox.
10. Study of analytical equipment for oil analysis.
11. To find out volatility characteristic of different fuels by ASTM distillation methods (diesel, gasoline lubricants).

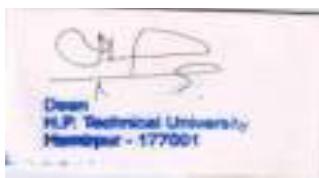


Teaching Scheme			Credits	Marks			Duration Semester	End Examination
L	T	P/D	C	I.A.	ESE	Total		
0	0	2	1	30	20	50	3 hrs	

Experiments as per the topics in the syllabus for the course ‘Signals & Systems lab.’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

LIST OF EXPERIMENTS:

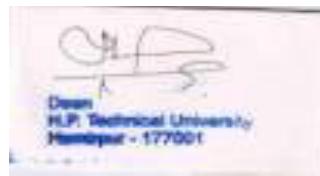
1. To determine the coefficient of impact for vanes.
2. To determine the coefficient of discharge of Notch (V and Rectangular types)
3. To determine the friction factor for the pipes.
4. To determine the coefficient of discharge of venturimeter.
5. To determine the coefficient of discharge, contraction & velocity of an orifice.
6. To find critical Reynolds number for a pipe flow.
7. To determine the meta-centric height of a floating body.
8. To determine the minor losses due to sudden enlargement, sudden contraction and bends.
9. To study the constructional details of a Centrifugal Pump and draw its characteristic curves.
10. To study the constructional details of a Reciprocating Pump and draw its characteristic curves.
11. To study the constructional details of a Hydraulic Ram and determine its various efficiencies.



K. DETAILED SYLLABI OF COURSES

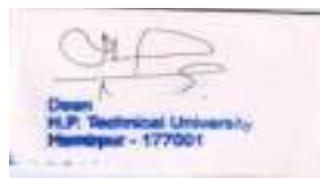
SCHEME OF TEACHING AND EXAMINATION B.TECH -ELECTRICAL AND ELECTRONICS ENGINEERING										
SEMESTER – III										
S. N.	Categ.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-301	Probability and Statistics	2	2	0	3	40	60	100
2	FC	HS – 305	Industrial Economics and Management	3	0	0	3	40	60	100
3	PC	EC-301	Analog Electronics	3	1	0	4	40	60	100
4	PC	EC-302	Digital Electronics	3	1	0	4	40	60	100
5	PC	EC-303	Network Analysis & Synthesis	3	0	0	3	40	60	100
6	PC	EEE-301	Electrical & Electronic Measurements	3	1	0	4	40	60	100
7	OE	-	Open Elective-I	2	0	0	2	40	60	100
Labs:										
1	PC	EC-305	Analog Electronics Lab	0	0	2	1	30	20	50
2	PC	EC-306	Digital Electronics Lab	0	0	2	1	30	20	50
3	PC	EEE-311	Electrical & Electronic Measurements Lab	0	0	2	1	30	20	50
			Total	17	6	7	24+2			

OPEN ELECTIVE I										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	HS	HS -306	Sociology & Elements of Indian History for Engineers	2	0	0	2	40	60	100
2	HS	HS -307	German Language - I	2	0	0	2	40	60	100
3	HS	HS-308	French Language – I	2	0	0	2	40	60	100

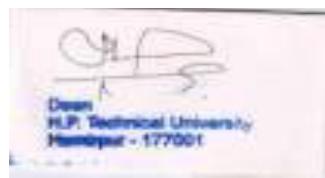


SCHEME OF TEACHING AND EXAMINATION B.TECH -ELECTRICAL AND ELECTRONICS ENGINEERING										
SEMESTER – IV										
S. N.	Categ.	Course Code	Subject	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		I.A Marks	ESE Marks	Total Marks
1	FC	MA-401	Optimization and Calculus of Variations	2	2	0	3	40	60	100
2	FC	HS-409	Humans Values & Professional ethics	2	2	0	3	40	60	100
3	PC	EEE-401	Electric Machine	3	1	0	4	40	60	100
4	PC	EEE-402	Power System	3	1	0	4	40	60	100
5	PC	EEE-403	Power Electronics	3	1	0	4	40	60	100
6	PC	EEE-404	Electromagnetic Field Theory	3	0	0	3	40	60	100
7	OE	-	Open Elective-II	2	0	0	2	40	60	100
Labs:										
1	PC	EEE-411	Electric Machine Lab	0	0	2	1	30	20	50
2	PC	EEE-412	Power Electronics Lab.	0	0	2	1	30	20	50
3	MC	EE-413	Electrical Simulation Lab-I	0	0	2	1	30	20	50
			Total	16	8	7	24+2			

OPEN ELECTIVE II										
S. N.	Cat.	Subject Code	Title	Teaching Hours Per Week			Credits	Examination		
				L	T	P/D		LA Marks	ESE Marks	Total Marks
1	HS	HS -410	Law for Engineers	2	0	0	2	40	60	100
2	HS	HS -411	German Language - II	2	0	0	2	40	60	100
3	HS	HS-412	French Language – II	2	0	0	2	40	60	100



SEMESTER-III



MA 301: PROBABILITY AND STATISTICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT – I

Probability and Random Variables: Introduction, Basic concepts—Sample space, Events, Counting sample space, Conditional Probability and Independence, Permutations and Combinations, Rules of Probability, Bayes' Theorem. Random Variables – Concept of Random Variable, Percentiles, Probability Distributions – Discrete & Continuous, Mean, Variance and Covariance of Random Variables, Chebychev's inequality.

UNIT - II

Standard Probability Distributions: Discrete distributions - Uniform, Binomial, Multinomial, Hypergeometric, Poisson, Negative Binomial, Poission; Continuous distributions - Normal, Exponential, Gamma, Weibull and Beta distributions and their properties - Function of Random variables.

UNIT – III

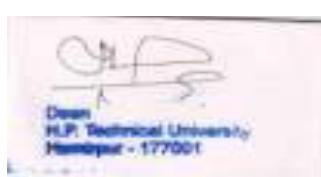
Sampling Distributions: Random sampling, Sampling Distributions of Means, Estimation, Properties of point estimators, Confidence interval, Maximum likelihood and Bayes estimators, Prediction intervals.

UNIT - IV

Testing of Hypothesis: Sampling distributions – testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions, tests for independence of attributes and Goodness of fit.

Linear Correlation and Regression Analysis: Introduction, Linear Regression model, Regression coefficient, Lines of correlation, Rank correlation.

Text Books:



22. Gupta, S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
23. Johnson. R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
24. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers", 5th Edition, 2011.

Reference books:

22. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearson Education, Delhi, 2002.
23. Lipschutz. S and Schiller. J, "Schaum's outlines - Introduction to Probability and Statistics", McGraw-Hill, New Delhi, 1998.
24. S. M. Ross, "Introduction to Probability and Statistics for Engineers and Scientists" 4th edition.



HS 305: INDUSTRIAL ECONOMICS AND MANAGEMENT

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT - I

Introduction to Engineering Economics - Technical efficiency, economic efficiency - cost concepts: elements of costs, opportunity cost, sunk cost, private and social cost, marginal cost, marginal revenue and profit maximization.

Supply and Demand: Determinants of demand, law of demand, determinants of supply, law of supply, market equilibrium - elasticity of demand - types of elasticity, factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, per capita income, methods of measuring national income. Inflation and deflation:

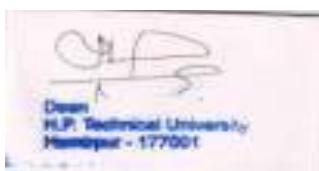
UNIT - II

Value Analysis - Time value of money - interest formulae and their applications: single-payment compound amount factor, single-payment present worth factor, equal-payment series compound amount factor, equal-payment series sinking fund factor, equal-payment series present worth factor, equal-payment series capital recovery factor, effective interest rate.

Investment Analysis: Payback period—average annual rate of return, net present value; Internal rate of return criteria, price changes, risk and uncertainty.

UNIT- III

Principles of Management: Evolution of management theory and functions of management; organizational structure - principle and types - decision making - strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree.



Human Resource Management: Basic concepts of job analysis, job evaluation, merit rating, wages,incentives, recruitment, training and industrial relations.

UNIT – IV

Financial Management: Time value of money and comparison of alternative methods; costing – elements& components of cost, allocation of overheads, preparation of cost sheet, break evenanalysis - basics of accounting - principles of accounting, basic concepts of journal, ledger, trade, profit&loss account and balance sheet.

Marketing Management: Basic concepts of marketing environment, marketing mix, advertising and sales promotion.

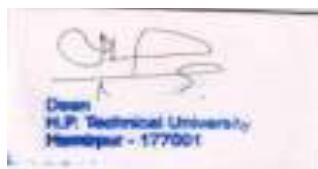
Project Management: Phases,organization, planning, estimating, planning using PERT & CPM.

Text Books:

17. PanneerSelvam, R, "*Engineering Economics*", Prentice Hall of India Ltd, New Delhi.
18. Dwivedi, D.N., "*Managerial Economics, 7/E*", Vikas Publishing House.

Reference Books:

81. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., "*Engg. Economy 15/E*",Prentice Hall, New York, 2011.
82. Chan S. Park, "*Contemporary Engineering Economics*", Prentice Hall of India, 2002.
83. F. Mazda, *Engg.Management*, Addison Wesley, Longman Ltd., 1998.
84. O. P. Khanna, *Industrial Engg.and Management*,DhanpatRai and Sons, Delhi, 2003.
85. P. Kotler, *Marketing Management, Analysis, Planning, Implementation and Control*,Prentice Hall, New Jersey, 2001.
86. VenkataRatnam C.S &Srivastva B.K,*Personnel Management and Human Resources*, Tata McGraw Hill.
87. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill.
88. Bhattacharya A.K., *Principles and Practice of Cost Accounting*, Wheeler Publishing.
89. Weist and Levy, *A Management guide to PERT and CPM*, Prantice Hall of India.
90. Koontz H.,O'Donnell C.,&Weihrich H, *Essentials of Management*, McGraw Hill.



EC-301 ANALOG ELECTRONICS

Teaching Scheme			Credits C	Marks			Duration End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Semiconductor diodes

Diode specifications, Diode resistance, Diode junction capacitance, Diode equivalent circuits, Load line analysis of diode circuit, Diode types: Zener, Backward, Varactor, Step recovery, Schottky, Tunnel.

Low frequencyBJT analysis

Simplified & complete h-parameter analysis for CB, CE and CC & configuration, Calculation of CB, CE & CC parameters using h-parameters.

UNIT-II

Multistage amplifier

General cascaded system, RC coupled amplifier and its frequency response, Merits and demerits, Transformer coupled amplifier,Cascode amplifiers, Darlington pair amplifiers, Effect of frequency on multistage amplifier stages.

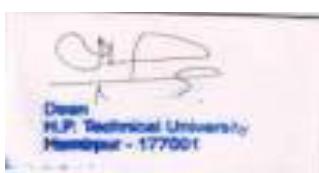
High frequency analysis of BJT

High frequency model for CE amplifiers, Approximate CE high frequency model with resistive load, CE short circuit gain.HF current gain with resistive load.

UNIT-III

Large signal amplifiers

Analysis and design of Class A, B, AB amplifiers; Class A, B, AB Push Pull amplifiers, Merits & demerits, Distortion calculations.



Tuned amplifiers

General behaviour of tuned amplifiers, Advantages and disadvantages of tuned amplifiers. Single tuned amplifiers, Frequency response of single tuned amplifiers, Staggered tuned amplifier.

UNIT-IV

Feedback amplifiers

Introduction, Characteristics of negative feedback, Feedback topologies: Voltage series, Voltage shunt, Current series and Current shunt.

Optoelectronic devices

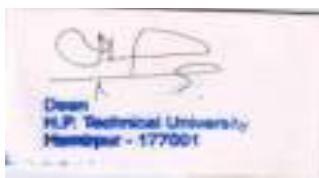
Photo sensors, Photo conductor, Photodiodes, Photo transistor, LED, LCD, OLEDs, Plasma display, Field emission displays, Electronic ink displays, Opto-couplers.

Text Books

4. Electronic Devices & Circuits, A.K.Maini, Wiley.
5. Basic Electronics and Linear Circuits, N.N. Bhargava, S.C.Gupta, D.C.Krlshreshtha, TMH
6. Electronic Devices & Circuit Theory,Boylestad, Pearson

Reference Books

4. Electronic Devices & Circuits, I.J.Nagrath, PHI.
5. Electronic Devices & Circuits,Salivahnna, TMH.
6. Fundamental of Electronics, Thomas, Morgan & Claypool Publishers.



EC-302 DIGITAL ELECTRONICS

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Number system & codes:- Binary arithmetic (Addition, Subtraction, Multiplication and Division), Floating point numbers. Diminished radix and radix compliments, BCD codes, 8421 code, Excess-3 code, Gray code, Error detection and correction: Parity code, Hamming code.

Logic gates:- Positive & negative logic, Tristate logic gates, Schmitt gates, Totem pole output and open collector output; Fan in and Fan out of logic gates, Buffer & trans-receivers, IEEE/ANSI standards symbols.

UNIT-II

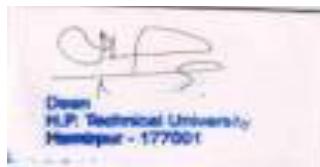
Boolean algebra simplification techniques:- Sum of products and product of sums simplification, NAND and NOR implementation,

Incompletely specified functions, Ex-OR functions, The map method: Two, Three, Four and Fivevariable maps; The tabulation method, Determination of prime implicants, Selection of essential prime implicants.

Logic families:- Classification of digital IC's, Significance & types, Characteristics parameters, TTL, ECL, CMOS logic families, NMOS & PMOS logic, Interfacing between TTL & CMOS.

UNIT-III:- Combinational logic circuits

Implementing combinational logic, Arithmetic circuits: Half adder, Full adder, Half subtractor, Full subtractor; Multiplexer, Encoder, Demultiplexer & Decoder.



Flip flops:- Introduction, S-R flip-flops, Level & edge triggered flip flops, JK flip-flop, D flip-flop, T flip-flop, Master slave JK flip-flop, Flip flop timing parameters & applications.

UNIT-IV

Shift Registers:- Shift register, Ring counter, Universal shift registers, SISO, PISO, SIPO & PIPO.

Counters:- Asynchronous ripple counter, Synchronous counter, Modulus of a counter, Binary ripple counter, Up & down, Decade counter.

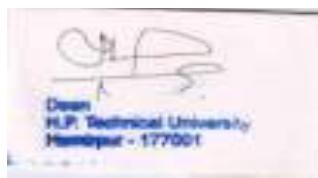
Semiconductor Memories:- Classification of memories, ROM, RAM, Static memory and Dynamic memory. Programmable logic arrays, Charged-coupled device memory

Text Books

13. Digital Electronics -Principle & Integrated circuits, Anil K Maini, Wiley India edition
14. Modern Digital Electronics, R.P.Jain, TMH
15. M. Morris Mano, Digital Design, Prentice Hall of India.

Reference Books

9. Digital Principle and Applications, Malvino and Leach, TMH
10. Digital Electronics, Kharate, Oxford University Press



Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each section/unit. However, students may be asked to attempt only one question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Analysis of coupled circuits and application of network theorem in AC circuits

Active element conventions: Modelling of coupled circuits, Dot convention in coupled circuits; Network theorems in AC circuits: Thevenin's and Norton's theorems, Superposition theorem, Reciprocity and maximum power transfer theorem.

Graph theory and network equations

Introduction and graph of a network, The incidence matrix, Fundamental cut set matrix, Fundamental tie set matrix and loop currents, Relation between various matrices. Network equilibrium equations: using KVL and KCL; Networks with mutual inductance, Duality.

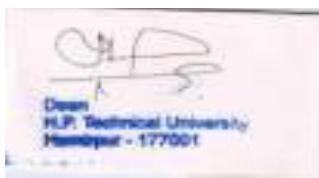
UNIT-II

Application of Laplace transform in circuit analysis

Review of Laplace transform: Definition of Laplace transform and its inverse, Laplace transform of basic functions, Properties of Laplace transform; Application of Laplace transforms in circuit analysis: Transformation of time domain circuit components to s- domain, Laplace transform to solution of network problems.

Transient response

Transient response of R-L, R-C, R-L-C circuits(series combinations only) for DC and sinusoidal excitations.



UNIT-III

Two port networks

Concept of two port networks, Classification of parameters: Open circuit and Short circuit parameters, Transmission and inverse transmission parameters, Hybrid and inverse hybrid parameters; Condition for reciprocity and symmetry, Inter-relationship between the parameters. Interconnection of two port networks: Series, Parallel, Cascade and series-parallel connection. T and pi representations.

UNIT-IV

Fundamentals of network synthesis

Network functions, Concept of poles and zeros, Necessary condition of a stability of a network function.

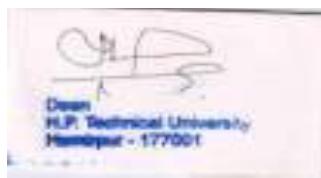
Hurwitz polynomial and its properties, Positive real function, Properties of positive real functions, Testing a positive real function, Synthesis of R-L, R-C and L-C driving point functions: Foster and Cauer forms.

Text Books

7. Fundamentals of Electric circuits, Charles K Alexander, Matthew N O Sadiku, TMH
8. Circuit Theory -Analysis and synthesis, A. Chakrabarti, Dhanpat Rai & co.
9. Network analysis and synthesis, Franklin F. Kuc, PHI.

Reference Books

9. Networks and Systems, D.Roy Choudhury, New Age International.
10. Network Analysis, Van Valkenberg, PHI
11. Engineering Circuit Analysis, William Hayt and Jack Kemmerly, TMH
12. Circuits and Networks- Analysis and Synthesis, A.Sudhakar and S.P.Shyam Mohan, TMH



EEE-301 ELECTRICAL & ELECTRONIC MEASUREMENTS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Errors & Accuracy:- Static error, Static calibration, Error calibration curve, Limiting errors, Relative limiting errors, Types of errors- Gross Errors, Systematic Errors, Random (Residual) Errors, Accuracy and precision, Static sensitivity, Linearity, Hysteresis, Threshold, Dead Time, Resolution of instrument, loading effects, Introduction to measurement standards.

UNIT-II

Electrical & Magnetic Measurements:- Introduction, D'Arsonval galvanometer, moving iron & moving coil instruments, Electrodynamometer, Electrostatic Instruments, Induction type energy-meter, wattmeter. Determination of B-H curve and Hysteresis loop.

Resistance Measurements:- Methods of measurement of low, medium and high resistance, measurement of earth resistance, localization of cable faults by Murray and Varley loop test.

Inductance and capacitance Measurements: Measurement of inductance and capacitance by A.C. Bridge methods, Q-factor and dissipation factor. Sources of errors in bridge circuits, Shielding of bridge elements, Wagner Earthing Device.

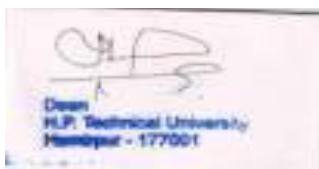
UNIT-III

Measurement of Power Factor and Frequency:- Single phase, three phase Electrodynamometer type power factor meter. Moving iron Power factor meters, Types of frequency meter, mechanical resonance type, Electrical resonance type, Ratio meter type.

UNIT-IV

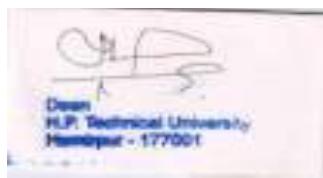
Potentiometers:- Basic D.C. potentiometer circuit, Modern form of D.C. potentiometer, measurement of voltage, current, Resistance and calibration of voltmeter & ammeter using D.C. potentiometer, volt ratio box, A.C. potentiometers and their applications.

Instrument Transformers:- Introduction, Use of Instrument transformers, Ratios, Basic constructional features of C.T. and P.T., ratio & phase angle errors, Reduction of Errors.



BOOKS/REFERENCES:

- 1)A Course of Electrical and Electronic Measurements and Instrumentation by A.K. Sawhney, Dhanpat Rai & Sons, 1993.
- 2)Electronic Instrumentation and Measurement Techniques by W.D. Cooper & A.D. Helfrick, Prentice-Hall India.
- 3)Electrical Measurement & Measuring Instruments by E.W. Golding, Wheeler Publishing, 5th Edition, 1994.



HS 306: SOCIOLOGY AND ELEMENTS OF INDIAN HISTORY FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 15 marks.

Objective:

- To familiarize the students with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society.
- To enable the students to analyse critically the social processes of globalization, modernization and social change.
- To help the students imbibe such skills that will enable them to be better citizens and human beings.

UNIT- I

Introduction to sociological concepts - structure, system, organization, social institution, Culture social stratification (caste, class, gender, power).

Understanding social structure and social processes - Perspectives of Marx and Weber.

UNIT –II

Political economy of Indian society - Industrial, Urban, Agrarian and Tribal society.

Social change in contemporary India - Modernization and globalization, Secularism and communalism.

UNIT –III

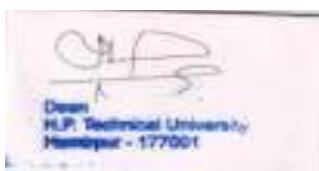
Introduction to Elements of Indian History - What is history? ; History Sources - Archaeology, Numismatics, Epigraphy and Archival research.

Indian history and periodization - evolution of urbanization process: first, second and third phase of urbanization.

UNIT - IV

From feudalism to colonialism -the coming of British; Modernity and struggle for independence.

Issues and concerns in post-colonial India (upto 1991) - Issues and concerns in post-colonial India 2ndphase (LPG decade post 1991)

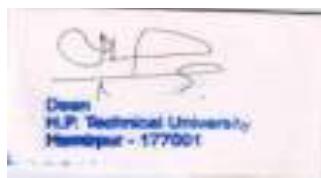


Text Books:

19. Desai, A.R. (2005), *Social Background of Indian Nationalism*, Popular Prakashan.
20. Giddens, A (2009), *Sociology*, Polity, 6th Edition.
21. Chandoke, Neera & Praveen Priyadarshi (2009), *contemporary India: Economy, Society and Politics*, Pearson.

Reference Books:

25. Guha, Ramachandra (2007), *India After Gandhi*, Pan Macmillan.
26. Haralambos M, RM Heald, M Holborn (2000), *Sociology*, Collins.
27. Sharma R. S. (1965), *Indian feudalism*, Macmillan.
28. Gadgil, Madhab & Ramchandra Guha (1999) - *This Fissured Land: An Ecological History of India*, OU Press.



HS 307: GERMAN LANGUAGE – I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in Germany.

UNIT - I

WichtigeSprachhandlungen: Phonetics – Sichbegrüßen - Sich und anderevorstellenformell / informell - Zahlen von 1 bis 1 Milliarde - verstehen&sprechen.

Grammatik: regelmäßige Verben im Präsens - “sein” und haben im Präsens - Personalpronomen im Nominativ.

UNIT- II

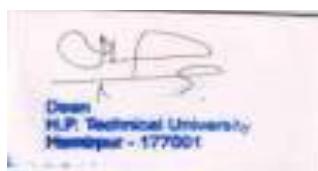
WichtigeSprachhandlungen: TelefonNummernverstehen und sprechen Uhrzeitenverstehen und sagen Verneinung “nicht und kein” (formell und informell)

Grammatik: Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/NeinFrage) Nomenbuchstabieren und notieren bestimmt und unbestimmter Artikel und Negativartikel im Nom. & Akkusativ

UNIT- III

WichtigeSprachhandlungen: Tageszeitenverstehen und überTermine sprechen- Verabredungen verstehen - Aufgaben im Haushalt verstehen

Grammatik: Personalpronomen im Akkusativ und Dativ - W-Fragen “wie, wer, wohin, wo, was usw.-Genitiv bei Personennamen - Modalverben im Präsens “können, müssen, möchten”



UNIT- IV

WichtigeSprachhandlungen:Sichaustauschen, was man kann, muss –BezeichnungenLebensmittel – Mengenangabenverstehen – PreiseverstehenundEinkaufzettelschreiben

Grammatik:Wortstellung in SätzenmitModalverben – Konnektor ”und” – “noch”-kein-----mehr – “wieviel, wieviele, wie alt, wie lange” –PossessivartikelimNominativ.

UNIT V

WichtigeSprachhandlungen:Freizeitanzeigenverstehen

HobbysundSportartenAnzeigenfürFreizeitpartnerschreibenbzw. daraufantworten –Vorlieben und Abneigungenausdrucken

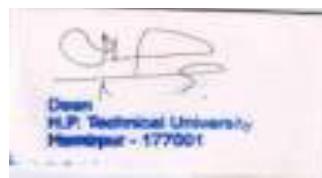
Grammatik:VerbenmitVokalwechselimPräsens – ModalverbenimPräsens“dürfen, wollen und mögen - “haben und sein” imPräteritum – regelmäßigeVerbenimPerfekt – Konnektoren “denn, oder, aber.

TEXT BOOK

1. Studio d A1. Deutsch alsFremdsprache with CD.(Kursbuch und Sprachtraining).

REFERENCES

1. German for Dummies
2. Schulz Griesbach



HS 308: FRENCH LANGUAGE - I

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To read and write short, simple texts.
- To understand a dialogue between two native speakers and also take part in short, simple conversations using the skills acquired.
- To offers opportunities for students of engineering for higher studies, research and employment in French.

UNIT - I

Grammar and Vocabulary: Usage of the French verb “se presenter”, a verbof self- introduction and how to greet a person- “saluer”.

Listening and Speaking: The authentic sounds of the letters of the Frenchalphabet and the accents that play a vital role in the pronunciation of the words.

Writing:Correct spellings of French scientific and technical vocabulary.

Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary: Definite articles, “prepositions de lieu” subjectpronouns.

Listening and Speaking: Pronunciation of words like Isabelle, presentezandla liaison – vousetes, vousappelez and role play of introducing each other –group activity.

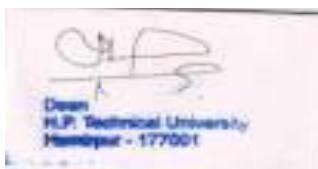
Writing:Particulars in filling an enrolment / registration form.

Reading Comprehension: reading a text of a famous scientist and answeringquestions.

UNIT – III

Grammar and Vocabulary:Verb of possession “avoir’ and 1st group verbs“er”, possessive adjectives and pronouns of insistence- moi, lui..andnumbers from 0 to 20.

Listening and Speaking: Nasal sounds of the words like feminine, ceinture,parfum and how to ask simple questions on one’s name, age, nationality,address mail id and telephone number.



Writing: Conjugations of first group verbs and paragraph writing on self –introduction and introducing a third person.

Reading Comprehension: reading a text that speaks of one's profile and answering questions

UNIT – IV

Grammar and Vocabulary: Negative sentences, numbers from 20 to 69, verb “aimer” and seasons of the year and leisure activities.

Listening and Speaking: To express one's likes and dislikes and to talk of one's pastime activities (sports activities), je fais du ping-pong and nasal sounds of words – janvier, champagne.

Writing: Conjugations of the irregular verbs: faire and savoir and their usage. Paragraph writing on one's leisure activity- (passé temps favori).

Reading: a text on seasons and leisure activities – answering questions.

UNIT - V

Grammar and Vocabulary: les verbes de direction- to ask one's way and to give directions, verbes- pouvoir and vouloir and 2nd group verbs, a droite, la premiere a gauche and vocabulary relating to accommodation.

Listening and Speaking: To read and understand the metro map and hence to give one directions – dialogue between two people.

Writing: Paragraph writing describing the accommodation using the different prepositions like en face de, derriere- to locate.

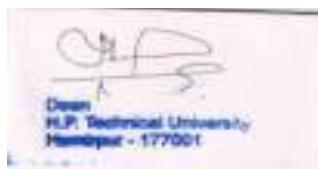
Reading Comprehension: A text / a dialogue between two on location and directions- ouest la poste/ la pharmacie, la bibliotheque?.....

TEXT BOOK

1. Tech French

REFERENCES

1. French for Dummies.
2. French made easy-Goyal publishers
3. Panorama



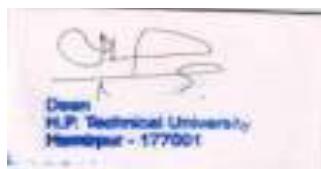
Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Analog Electronics Lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

13. To study the characteristics of different types of Diodes.
14. Find out h-parameters of BJT
15. Design and implement CE-BJT amplifier and verify various parameters
16. To study the two stage RC coupled transistor amplifier.
17. To study Class-B push pull amplifier at audio frequency.
18. To find the Efficiency of Class-A or Class AB Amplifier.
19. To plot frequency response of Single Tuned Amplifier.
20. To study the frequency response of BJT amplifier with and without feedback.
21. To study effects of Voltage Series Feedback.
22. To study effects of Voltage Shunt Feedback
23. To study modelling of circuits with optoelectronic devices using simulation software.
24. To study current voltage characteristics of LED.

NOTE :The above experiments may also be performed on simulation software



EC-306 DIGITAL ELECTRONICS LAB

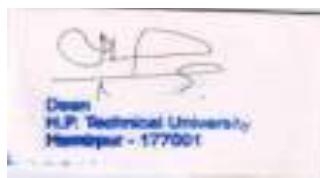
Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘Digital Electronics lab.’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments:

40. To verify the truth table of logic gates realize AND, OR, NOT gates
41. To realize AND, OR gates using diodes and resistors
42. Implementation of X-OR and X-NOR using NAND and NOR gates.
43. Design of a digital circuit using K-map and realise by using NAND-NAND or NOR-NOR gates.
44. Design of an adder logic circuit.
45. Design of a subtractor logic circuit.
46. Implementation of logic equations using MUX, DEMUX
47. Design of an encoder logic circuit.
48. Design of a decoder logic circuit.
49. Conversion from one flip flop to another.
50. Design of a counter and its realization using FFs.
51. Design of a shift register and its realization using FFs.
52. Design BCD to seven-segment display using 7447 IC

NOTE: The above experiments may also be performed on simulation software

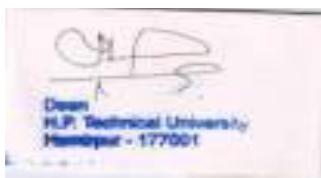


Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

List of Experiments

1. To identify meters from the given lot.
2. To calibrate an energy meter with the help of a standard wattmeter & a stop watch.
3. To measure power & power factor by 3-Ammeter method.
4. To measure power & power factor by 3-Voltmeter method.
5. To measure power & power factor in 3-phase circuit by 2-Wattmeter method.
6. To measure capacitance by De Sauty's bridge.
7. To measure inductance by Maxwell's bridge.
8. To measure frequency by Wein's bridge.
9. To measure the power with the help of C.T & P.T.
10. To measure low resistance by Kelvin's double bridge.

Note: At least eight experiments to be performed from above list



MA 401: OPTIMIZATION AND CALCULUS OF VARIATIONS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Objectives:

The objective of this course is to present different methods of solving optimization problems in the three areas of linear programming, nonlinear programming, and classical calculus of variations. In addition to theoretical treatments, there will be some introduction to numerical methods for optimization problems.

UNIT - I

Introduction: A survey of some simplified examples of common real world situations leading to optimization problems, basic formulation and theory of optimization problems.

Linear programming: Linear programming (optimization of linear functions subject to linear constraints): basic theory; simplex method; duality, practical techniques.

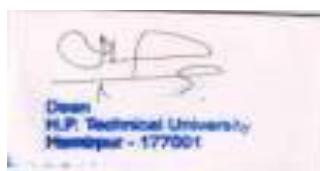
UNIT – II

Linear programming: Basic LPP - solution techniques (Simplex, Artificial Basis), Complementary Slackness Theorem, Fundamental theorem of Duality, degenerate solutions, cycling; Applications - elements of dynamic programming including Hamiltonian, Bellman's optimality principle.

Transportation and Assignment Problems: Solution of a balanced transportation problem, degeneracy in transportation problems and alternate solutions, Mathematical problems in formulation of assignment problems.

UNIT – III

Nonlinear programming: Nonlinear programming (optimization of nonlinear functions subject to constraints) with Lagrange multipliers, Karush-Kuhn-Tucker optimality conditions, convexity, duality.



Approximation methods for nonlinear programming: Line search methods, gradientmethods, conjugate gradient methods; Networkingtechniques – PERT and CPM.

UNIT - IV

Calculus of Variations: Basic definitions -functionals, extremum, variations, function spaces; Necessary conditions for an extremum, Euler-Lagrange Equation, convexity and it's role in minimization, minimization under constraints; Existence and nonexistence of minimizers; Applications - Isoperimetric problems, Geodesics on the surface.

Text Books:

33. C. B. Gupta, "Optimization Techniques in Operation Research," I. K. International Publishing House Pvt. Ltd.
34. A. S. Gupta, Calculus of Variations and Applications, PHI Prantice hall India.
35. Mukesh Kumar Singh, "Calculus Of Variations" Krishna Prakashan Media (P) Ltd.
36. J. K. Sharma, Operations Research – Problems and Solutions, Macmillian Pub.

Reference books:

41. I. M. Gelfand and S. V. Fomin, "Calculus of Variations" Dover Publications IncMineola, New York.
42. Purna Chand Biswal, "Optimization in Engineering, Scitech Publications India Pvt. Ltd.
43. B. S. GREWAL, Higher Engineering Mathematics, Krishna Publications.
44. G. Hadly, Linear Programming, Narosa Publishing House.
45. KantiSwarup, P. K. Gupta and Manmohan, "Operations Research," Sultan Chand & Sons.



HS 409: HUMAN VALUES AND PROFESSIONAL ETHICS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	2	0	3	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable students to explore the purpose of value education.
- To understand the purpose of harmony with oneself, family, society and nature.

Unit I: Introduction –Need and Basic Guidelines

13. Understanding the need , basic guidelines, content and process of value Education
14. Self-Exploration – purpose, content and process, ‘Natural Acceptance’ and Experiential Validation – as the mechanism for self-explanation.

Unit II: Process for Value Education

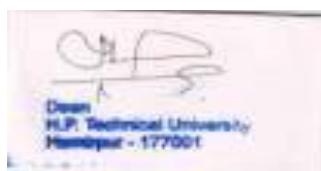
25. Continuous Happiness and Prosperity – A look at basic Human Aspirations.
26. Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority
27. Understanding Happiness and prosperity – A critical appraisal of the current scenario.
28. Method to fulfill the human aspirations; understanding and living in harmony at various levels

Unit III: Harmony in Human Beings

19. Understanding human being as a co-existence of the self and the body.
20. Understanding the needs of Self (‘I’) and ‘Body’ – Sukh and Suvidha.
21. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)

Unit IV: Harmony in Myself and body

13. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
14. Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning of Prosperity in detail.



UNIT V: Harmony in Family, Society and Nature

19. Understanding harmony in the family, society and nature.
20. Understanding values in human relationship; meaning of Nyaya and Program for its fulfillment to ensure Ubhay-tripti.
21. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Text Books

13. R R Gaur, RSangal and GP Bagaria, *A Foundation Course in value Education*, Published by Excel Books (2009).
14. R R Gaur, R Sangal and G P Bagaria, *Teacher's Manual (English)*, 2009.

Reference Books

37. E.F. Schumacher, *Small is Beautiful; a study of economics as if people mattered*, Blond & Briggs, Bratain, 1973.
38. PL Dhar, RR Gaur, *Science and Humanism*, common wealth publishers, 1990.
39. A.N. Tripathy, *Human values*, New Age International Publishers, 2003.
40. E.G. Seebauer& Robert, L BERRY, *Foundational of Ethics for Scientists &Engineers*, Oxford University Press, 2000.
41. M. Govindrajran, S.Natrajan& V.S. Senthil Kumar, *Engineering Ethics (including human Values)*, Eastern Economy Edition, Prentice hall of India Ltd.
42. B.L. Bajpai, 2004, *Indian Ethos and Modern Management*, New Royal book Co; Lucknow, 2004, Reprinted 2008.



Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Unit-I

Single-Phase Transformers: principle of transformer operation, emf equation, voltage ratio and turns ratio, construction of single-phase transformers, ideal transformer, transformer on no load: phasor diagram and equivalent circuit, practical transformer: phasor diagram and equivalent circuit, voltage regulation, losses, open circuit, short circuit, back to back test, transformer efficiency, condition for maximum efficiency, per unit transformer values, all day efficiency.

Single-phase auto transformer, volt ampere relation, step up auto transformer, auto transformer efficiency, saving in conductor material, conversion of a two winding transformer to an auto transformer, advantages & disadvantages of auto transformer, applications of auto transformer.

Unit-II

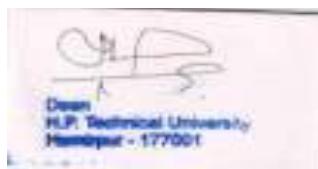
Three- phase Transformer:

Three-phase transformer, Comparison between three phase transformer bank and three phase transformer units, three-phase transformer construction, three-phase transformer groups, three-phase transformer connections, factors affecting the choice of connections, delta- delta connection, star-star connection, star- delta connection, delta-star connection, open delta connection, scott three-phase/ two phase connection, Comparison of Distribution and Power Transformer , application of transformers

Three winding transformers: equivalent circuit, determination of parameters, voltage regulation, polarity of the transformers, parallel operation of single-phase transformers and Three-phase transformers , wave shape of no load (exciting) current, inrush of magnetizing current, construction of current transformers and voltage transformers, transformer cooling.

Unit-III

DC Machines-I: basic structure of electric machine, dc generator construction, equivalent circuit of dc machine, type of dc machine, emf equation of dc machine, armature reaction in dc generators, commutation, methods of improving commutation, demagnetizing and cross magnetizing ampere turns, characteristics of dc generator.

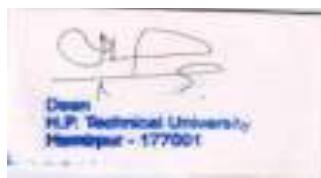


Unit-IV

DC Machine-II: Motor principle, significance of back emf, equivalent circuit of a dc motor , torque equation of dc motor, types of dc motor, characteristics of shunt, series & compound motors, speed control of dc motors, starting of dc motors & starters, losses in dc machine, efficiency of a dc machine, testing of a dc machines, application of dc machines.

Recommended Books:

1. “Electrical Machinery” by P. S.Bimbhra, Khanna Publishers, Delhi.
2. “Generalized theory of electrical machines” by P. S.Bimbhra, Khanna Publishers, Delhi.
15. “Electric Machinery” by Fitzgerald & Kingsley, MGH.



EEE-402 POWER SYSTEM

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction:- Basic structure of power system, sources of electric energy: conventional and non-conventional; cogeneration, combined heat and power, captive power plants, distributed generation.

Load characteristics and economic aspects:- Commonly used terms and factors, curves useful in system operation and planning, economics of power factor improvement, interconnection of power stations and tariffs.

UNIT-II

Transmission Line parameters:- Types of conductors, Ampere's law, inductance of a conductor, inductance of a single phase line, inductance of a three-phase line, inductance of three-phase double circuit line, bundled conductors, skin effect , proximity effect, Guy's theorem, Capacitance of single phase line, capacitance of a three-phase line, capacitance of double circuit three phase line, effect of earth on capacitance.

Transmission Line Performance:- Classification of lines, models, circuit constants of transmission lines: short, medium and long lines; Ferranti effect, power flow through a line, sending end power circle diagram, reactive power generation/absorption of line, compensation and voltage control.

Insulators for overhead transmission lines:- Types of insulators, ratings, voltage distribution across suspension insulators, string efficiency, methods to improve string efficiency.

Mechanical Design of transmission line:- Calculation of sag and tension, equivalent span length and sag, effect of ice and wind loading, stringing chart, sag template, conductor vibrations and vibration dampers.

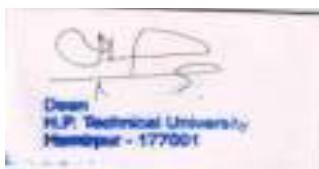
UNIT-III

Corona and Radio interference:- Critical voltages, corona loss, advantages and disadvantages of corona , factors affecting corona loss, effect of corona on line design, radio interference.

Insulated Cables:- Cable conductors, insulating materials, insulation resistance, electrostatic stress in cables, grading of cables, capacitance of a three-core cable, dielectric loss, dielectric power factor, classification of cables.

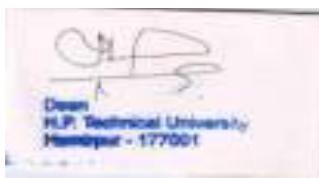
UNIT-IV

Distribution System:- Effect of voltage on transmission efficiency, Kelvin's law, radial and ring main distributors, interconnectors, methods of feeding distributors, ac distribution, three-phase, four wire distribution system, stepped and tapered mains.



BOOKS/REFERENCES:

- 1) Electric Power systems by C.L. Wadhwa, New Age international, New Delhi, 4th Edition, 2006.
- 2) Electric Power generation transmission and distribution by S.N. Singh, Prentice-hall of India, Private Limited, New Delhi, 2nd Edition, 2008.
- 3) Electric Power Distribution System Engineering by Turan Gonen, McGraw Hill, New York 2nd Edition, 2007.
- 4) A course in Electrical Power by M.L.Soni, U.S.Bhatnagar and P.V.Gupta, Dhanpat Rai & Sons, New Delhi, 1963
- 5) Elements of Power System Analysis by W.B. Stevenson McGraw Hill, 4th Edition, 1982
- 6) Power System Engineering by D.P. Kothari and I.J. Nagrath, Tata McGraw Hill, New Delhi, , 2nd Edition, 2008.



EEE-403 POWER ELECTRONICS

Teaching Scheme			Credits C	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

Unit-I

Power electronics devices: Role of power electronics, construction and characteristics of power diode, power transistor, power MOSFET, SCR, GTO, TRIAC & DIAC. SCR: two transistor model, methods of turn-on, R, RC and UJT firing circuit, commutation techniques, series and parallel operation.

Unit-II

Phase-controlled converters (AC to DC converters): One, two, three, six pulse converters, fully and half controlled converters, load voltage waveforms with different types of loads, output voltage equations, continuous and discontinuous modes of operation, input power factor of converter, reactive power demand, effect of source inductance, introduction to four quadrant/dual converter.

Unit-III

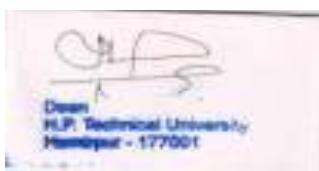
Cycloconverters (AC to AC converters) : basic principle of frequency conversion, types of cycloconverter, principle of operation of step up and step down cycloconverter, single-phase to single-phase cycloconverter with resistive and inductive load. Three-phase to single-phase cycloconverter, three-phase to three-phase cyclo converter, output voltage equation of cycloconverter.

Unit-IV

Choppers (DC to DC converter): classification of choppers, principle of operation, steady state analysis of class-a choppers, step up chopper: steady state analysis, current commutated and voltage commutated chopper, output voltage control techniques, one, two and four quadrant choppers.

Recommended Books:

1. "Power Electronics: Circuits, Devices & Applications" by M.H. Rashid, Prentice Hall of India Ltd, 2004.
2. "Power Electronics" by P.S. Bimbhra, Khanna Publishers, 2006.
3. "Power Electronics" by M.D. Singh and K.B. Khanchandani, Tata MC Graw Hill Pub, 2005.
4. "Power Electronics: Converters, Applications and Design" by Ned Mohan, T.M. Undeland



EEE-404 ELECTROMAGNETIC FIELD THEORY

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

Note: The question paper shall consist of four units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.

Apart from this, the paper setter will set question No. 9 which will be compulsory and cover the entire syllabus. This question should have objective or short answer type questions and shall be of 20 marks.

UNIT-I

Introduction:- Review of vector analysis: scalar & vector products: gradient, divergent and curl of a vector and their physical explanation Transformation amongst rectangular, cylindrical and spherical co ordinate systems.

UNIT-II

Electrostatics:- Coulomb's law, electric field intensity from point charges, field due to continuous distribution of charges, Gauss's law, Electric displacement and displacement density potential function, potential field of a point charge, Laplace's and Poison's equations.

Magneto statics:- Magnetic field intensity and magneto motive force, Ampere's Circuital law, Energy stored, Biot Savart law, vector potential, magnetic dipole.

UNIT-III

Time Dependent Fields:- Ampere's work law in differential vector form, continuity of currents, conduction and displacement current. Maxwell's equations and their interpretations, boundary conditions. Wave equations, sinusoidal time varying fields, uniform plane wave in dielectric and conductor media, skin effect and depth of penetration, reflection and refraction of plane waves at boundaries for normal and oblique incidence surface impedance.

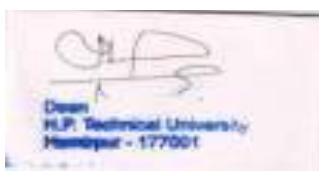
Energy Flow and Poynting Vector:- Poynting's theorem, interpretation of $E \times H$, simple application, complex poynting vector.

UNIT-IV

Guided Waves:-

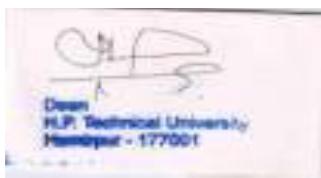
(a) Transmission line theory from the circuit concept, properties; constants; transmission line equations; infinite line; reflections in transmission lines; voltage, current and impedance relations open and short circuit lines; Experimental determination of line constants. Standing wave ratio; impedance matching, quarter and half wave lines, single stub and double stub matching; circle diagram - Smith chart.

(b) Waves between parallel planes: Transverse Electric waves, Transverse magnetic waves; characteristics of TE & TM waves; Transverse Electromagnetic waves; velocity of propagation; Attenuation in parallel plane guides; wave impedance.



BOOKS/REFERENCES:

- 1) Electromagnetic waves & Radiating systems, E. Jordan, Prentice-Hall, 1950.
- 2) Principle and applications of Electromagnetic fields by R.Plonsey and R.E.Collin, McGraw-Hill Book Co., New York, 1961
- 3) Applied Electromagnetics by M.A. Planus, Mc Graw-Hill Book Co, 1978



HS 410: LAW FOR ENGINEERS

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.
- To familiarize students with the constitution of India and laws in new areas viz. IPR, ADR, Human Rights, Right to Information, Corporate law, Law relating Elections and Gender Studies.

UNIT- I

Constitutional Law: Nature of Indian Constitution (features), fundamental rights, duties and directive Principles of State Policy (DPSP's), forms of Governments, structure of Government of India, role and responsibility of executive, legislature/parliament and judiciary, nature of Indian federal system, center state and relations.

Basic structure of the Indian constitution, basic features of the Indian, constitutional amendments - GolakNath, KeshwanandaBharti, Maneka Gandhi (1978) and S.R. Bommai case (1994), (floor test).

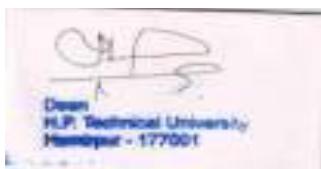
UNIT-II

Law of contract: General principles of Indian Contract Act, 1862, kinds of Government contracts and dispute settlement, standard and printed form of contract, essential elements of valid contract proposal, acceptance communication and revocation thereof, relevance of time in contractual obligation.

Main objectives of Arbitrates and Conciliation Act-1996, tort and law of tort, general principles of tort law, classifications of torts: property vs. person.

UNIT - III

Administrative Law: Evolution, nature and its scope, conceptual objection against growth of administrative rule of law and separation of power, clarification of administrative actions, judicial review of administrative actions, exclusion of judicial review and concept of "Ombudsman"; Right to Information Act, 2005 (Sub Section 1 - 20)



Environmental Law: Definition, meaning and its nature, environmental (Protection) Act-1986, Water (Preservation and Control of Pollution) Act-1974, Air (Prevention and Control of Pollution) Act-1981; Environmental pollution, overall remedies and procedures.

UNIT - IV

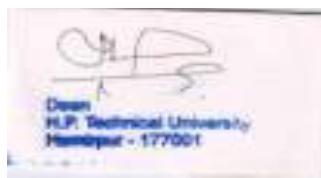
Human Rights: Legality of human rights, universal declaration of human rights, 1948, difference between civil and political rights, individual and human rights -human rights of child, weaker section of society, prisoners, and refugees, International Human Rights Commission.

Text Books:

25. D.D. Basu, *Shorter Constitution of India*, Prentice Hall of India, (1996)
26. MeenaRao, *Fundamental concepts in Law of Contract*, 3rd Edn. Professional Offset, (2006)
27. H.O.Agarwal, *International Law and Human Rights*, Central Law Publications, (2008)

Reference Books:

41. H.M. Seervai, *Constitutional Law of India*, Tripathi Publications, (1993).
42. S.K. Kapur, *Human Rights under International Law and Indian Law*, Central Law Agency, (2001)
43. NeelimaChandiramani, *The Law of Contract: An Outline*, 2nd Edn. Avinash Publications Mum, (2000)
44. Avtarsingh, *Law of Contract*, Eastern Book Co., (2002).
45. Anson W.R.(1979), *Law of Contract*, Oxford University Press



HS 411: GERMAN LANGUAGE – II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 302: GERMAN LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students to speak and understand about most of the activities in the day to day life.
- The students will be able to narrate their experiences in Past Tense.
- The students will be able to understand and communicate even with German Nationals.
- By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Wichtige Sprachhandlungen: Zimmersuche, Möbel

Grammatik: Verbenmittrennbaren Vorsilben im Präsens und Perfekt. Verbenmittrennbaren Vorsilben und Modalverben im Präsens. Verbenmituntrennbaren Vorsilben im Perfekt. Unregelmäßige und gemischte Verben im Perfekt.

UNIT - II

Wichtige Sprachhandlungen: Kleidung, Farben, Materialien.

Grammatik: formelle Imperativsätze mit "Sie" informelle Imperativsätze Vorschläge mit "wir" – "sollen/wollen wir" - Sollich? Modalpartikeln "doch" "mal" "doch mal".

UNIT - III

Wichtige Sprachhandlungen: Sehenswürdigkeiten (Prater, Brandenburger Tor, Kolosseum, Eifelturm)

Grammatik: Ortsangaben mit Akk. und Dativ "alle", "man" Indefinitepronomen "etwas", "nichts".



UNIT - IV

WichtigeSprachhandlungen: Essen und TrinkenimRestaurant,Partyvorbereitung und Feier.

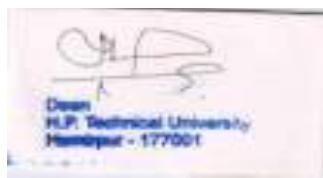
Grammatik: NomenausAdjektivennach “etwas”und “nichts” NomenausdemInfinitiv von Verben, zusammegesetzteNomen und ihreArtikel. AdjektiveimNom.undAkk.nachunbestimmtenArtikel, Negativartikel und Possessivartikel.

TEXT BOOK

9. *Studio d A1. Deutsch alsFremdsprache with CD.(KursbuchundSprachtraining).*

REFERENCES

1. *German for Dummies*
2. *Schulz Griesbach*



HS 412: FRENCH LANGUAGE - II

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
2	0	0	2	40	60	100	3 hrs
Prerequisite							
HS 303: FRENCH LANGUAGE - I							

Note: The question paper shall consist of five units as per the syllabus. The paper setter will set two questions from each Section/Unit. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12 marks.

Objectives:

- To enable the students communicate effectively with any French speaker
- To enable students to access information on the internet, send e mails, pass level 1 exam conducted by Alliance Française de Madras.
- To enable students to enhance their lexical and technical competence and have a competitive edge in the international market. By the end of Phase – II the students will have a reasonable level of conversational skills.

UNIT - I

Grammar and Vocabulary: The second group verbs: Finir, rougir, grossir, grandir. “Les prépositions de temps”: à, en, le, de 7h à 8h, jusqu’ à, vers.

Listening and Speaking – the semi-vowels: Voilà, pollutant. Writing - the days of the week, months, technical subjects, time, “les spécialités scientifiques et l’ année universitaire, paragraph writing about time table.

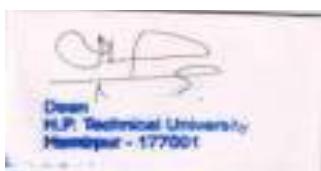
Reading: Reading of the text and comprehension – answering questions.

UNIT - II

Grammar and Vocabulary – The adjectives, the nationality, feminine & masculine noun forms “les métiers scientifiques”.

Listening and Speaking – Vowels: soirée, année, près de, très.

Writing: Countries name, nationality, “les métiers scientifiques”, numbers from: 69 to infinitive and some measures of unit. Reading Comprehension: reading a text.



UNIT - III

Grammar and Vocabulary – near future, The demonstrative adjectives, Express the aim by using the verb, Listening and Speaking – “La liaison interdite – enhaut”. Writing – some scientific terms, French expressions to accept an invitation. Sentence framing. Reading Comprehension – reading a text.

UNIT - IV

Grammar and Vocabulary – the verbs: manger, boire, the partitive articles

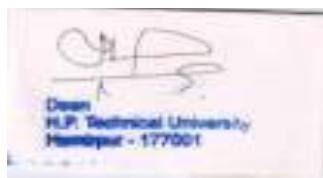
Listening and Speaking – “le ‘e’ caduc Writing- the food, the ingredients, fruits, vegetables, expression of quantity, paragraph writing about food habits. Reading – reading a text.

TEXT BOOK

9. *Tech French*

REFERENCES

1. *French for Dummies.*
2. *French made easy: Goyal publishers.*
3. *Panorama.*



Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	I.A.	ESE	Total	
0	0	2	1	30	20	50	3 hrs

Experiments as per the topics in the syllabus for the course ‘PCB & Electronic workshop lab’ will be conducted in the laboratory class. Following is the list of experiments out of which 8-9 experiments must be performed during the semester:

List of Experiments

INDUCTION MOTORS

1. To perform no load test & block rotor test on three-phase squirrel cage induction motor.
2. To perform no load test & block rotor test on three-phase slip ring induction motor.
3. To study the starting methods of three-phase induction motors.
4. To study the cascading of two induction motors.
5. To conduct the load test to determine the performance characteristics of the induction motor.
6. To study speed changing by pole changing method.

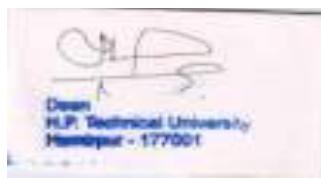
SYNCHRONOUS MACHINES

1. To draw characteristics of alternator under different loading condition.
2. To find out regulation by synchronous impedance method.
3. To find out regulation by ZPF method.
4. To draw characteristics of alternator under different loading condition.
5. To plot V-Curves of a synchronous motor.
6. To measure steady state reactances (X_d , X_q) of a synchronous machine.

NOTE: At least eight experiments are to be performed in the semester from the above list.

Recommended Books:

“Experimentation and viva voce on electrical machines”by V.N. Mittal & A. Mittal, Standard Publications



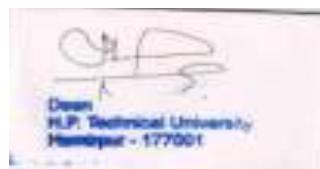
EEE-412: POWER ELECTRONICS LAB

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

LIST OF EXPERIMENTS:

1. Experiment to study characteristics of diode, SCR and TRIAC.
2. Experiment to study characteristics of transistor and MOSFET.
3. Experiment to study R and R-C firing circuits.
4. Experiment to study UJT firing circuit.
5. Experiment to study AC phase control.
6. To study three-phase full-wave uncontrolled rectifier operation with R and R-L load and observe its input/output Wave form.
7. Experiment to study dc chopper.
8. Experiment to study single-phase cyclo converter characteristics.
9. To study single-phase full wave controlled rectifier using SCR and UJT with R and R-L load and observe its input/output Waveform with and without freewheeling (commutating) diode.
10. Experiment to study Lamp-Dimmer circuit using Diac & Triac with lamp load.

Note: At least eight experiments have to be performed in the semester from the above list.



EE-413 :- Electrical Simulation Lab-1

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
0	0	2	1	30	20	50	3 hrs

List of Experiments

1. Familiarization with electronic circuit simulation tool.

Designing with electronic circuit simulation tool.

2. Design a full wave rectifier.
3. Design a full wave bridge rectifier.
4. Design a Voltage regulator using Zener diode.
5. Design a common emitter single stage amplifier.
6. Verify the operations of OR, AND, NOT, NOR, NAND and XOR gates.
7. Design a ring counter and twisted ring counter.
8. Design a mod – 8 up and down counter.
9. Design a square wave generator using IC555 timer.
10. Design a biased diode clipper

