Group – A

Applied Maths-I (AS-1001)

Course Code	AS-1001	Credits-4	L-3, T-1, P-0
Name of the Course	Applied Maths-I		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section A

Function of several variables, limits and continuity, partial derivatives, higher order partial derivatives, Euler's theorem, Jacobians, maxima of functions of two variables. Lagrange's method of multipliers, double and triple integrals, change of variables, applications of double and triple integrals, beta and gamma functions.

Section B

Reduction formulae, definite integral as limit of a sum, area under a curve, length of an arc of a curve. Linear differential equations of second order with constant coefficients: complementary functions, particular integrals, Euler homogeneous form, and variation of parameters. Convergence of series, Taylor's theorem with remainder, power series expansion of functions, Taylor's and Maclaurin's series.

Section C

Matrices: review of properties of determinants. Elementary operations on matrices. Homogeneous and nonhomogeneous system of linear equations and their properties, bilinear, quadratic, hermitian and skew-hermeitian forms. Eigenvalues of hermitian, skew-hermitian and unitary matrices.

Section D

Complex analytic functions: brief review of complex numbers, complex variable, concept of limit, continuity and derivatives of analytical function, cauchy-Riemann equations, harmonic function, complex series, some elementary functions, logarithm.

Books:

1. Kryszig, Thomas-Finny, Advanced Engineering Mathematics.
2. S.S. Shastri, "Engineering Mathematics (2^{nd} edition) Vol-I and Vol-II.
3. B.S. Grewal, Higher Engineering Mathematics.
4. Piskunov, Differential and Integral Calculus.
5. R.K.Jain and S.R. K. Iyengar, Advanced Engineering, Mathematics.
6. Michael D. Greenberg, Advanced Engg. Mathematics.

Applied Physics-I (AS-1002)

Course Code	AS-1002	Credits-4	L-3, T-1, P-0
Name of the Course	Applied Physics-I		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section A

Physical Optics: Interference-division of wavefront-fresnel's biprism, division of multitude, interference by Newton's rings, Michelson's interferometer and its applications.

Diffraction- Difference between fraunhofer and fresnel diffraction through slit, plane transmission grating, its dispersal and resolving powers Polarization- polarized and unpolarised light, double refraction, nicol prism, quarter and half wave plates, polarimetry, biquartz and laurents half shade polarimeters, simple concepts of photoelasticity.

Special theory of Relativity: Michelson-Moreley experiments, Relativistic transformations, Variation of mass with velocity, mass energy equivalence.

Section B

Wave and oscillations: Simple harmonic oscillations, simple concept of harmonic oscillator, resonance, quality factor, E.M wave theory, Review of basic ideas, Maxwell's equations and their experimental basis. Simple plane wave equations, simple concepts of wave-guides and co-axial cables, Poynting vector.

Dielelectrics: Molecular Theory, polarization, displacement susceptibility, dielectric coefficient, permitivity and various relations between these Gauss's law in the presence of dielectric, energy stored in an electric field. Behavior of dielectric in field –simple concepts, dielectric losses.

Section C

Quantum Physics: Difficulities with classical physics, Introduction to quantum mechanics-simple concepts, discovery of Planck's constant. De Broglie Waves, Phase and Group Velocities, Particle diffraction, Uncertainty Principle, the wave equation, Postulates of quantum mechanics, Time dependent and independent Schrodinger equation, Expectation Values, Eigen Values and Eigen functions, Particle in a box, Finite Potential Well, Tunnel Effect, Harmonic oscillator. Statistical distributions, Maxwell Boltzmann Statistics, Quantum statistics.

Section D

Nuclear Physics: Neutron cross-section, nuclear fission, moderators, nuclear reactors, reactor criticality, interaction of radiation with matter-basic concepts, Radiation Detectors-ionization chamber, G.M counter, scintillations & solid state detectors, cloud Chamber & bubble chamber.

Books:

1. Arthur Beiser, Concepts of Modern Physics, 5th International edition Tata McGraw Hill
2. Wehr, Richards & Adair, Physics of the Atom.
3. A.S.Vasudeva, Modern Engg. Physics.

Engg. Graphics Drawing (ME-1001)

Course Code	ME-1001	Credits-6	L-0, T-0, P-6
Name of the Course	Engg. Graphics Drawing		
Lectures to be Delivered	78 Hrs. of Lab. Work (6 hrs. per week)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		Max Marks: 50	Min. Pass Marks: 25

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.
3. This course will be conducted in drawing hall fitted with drawing tables and drafters.

Section A

Drawing Techniques: Various type of lines, principal of dimensioning, size and location as per IS code of practice (SP-46) for general engg. Drawing. Practice of drawing, various types of lines and dimensioning exercises. Drawing exercises pertaining to symbols. Conventions and Exercise of lettering techniques. Free hand printing of letters and numerals in 3, 5, 8 and 12 mm sizes, vertical and inclined at 75 degree. Instrumental lettering in single stroke. Linear Scale, Diagonal scale & vernier scale.

Projection of Points, Lines and Planes: Concept of horizontal and vertical planes. First and third angle projections: projections of point and lines, true length of lines and their horizontal and vertical traces, projection of planes and their traces. Auxiliary planes.

Section B

Projections of Solids: Right regular solids of revolution and polyhedrons etc. and their auxiliary views.

Section C

Sectioning of Solids: Principal of sanctioning, types of sanctioning and their practice on projection of solids, sectioning by auxiliary planes.

Isometric Projection: Concept of isometric views: isometric scale and exercise on isometric views.

Section D

Practice In: Orthographic projections

Development of Surfaces: Development of surfaces of cylinders, cones, pyramid, prism etc. exercises involving development of unique surfaces like Y-piece, hopper, tray, truncated pieces etc.

Intersection of Surfaces: Intersection of cylinders, cones and prisms with their axes being vertical, horizontal or inclines. Exercise on intersection of solids-cylinder and cylinder, cylinder and cone, prism and prism.

Note: Some exercise in each Section should be done using Auto CAD.

Books:

1. N.D. Bhatt, Elementary Engineering Drawing.
2. P.S.Gill, Engineering Drawing & Engg. Graphics.
3. L.V. Lakshminarayan & R.S. Vaish Engineering Graphics.
4. N.D. Bhatt and V.M. Panchal, Engineering Drawing Plane and Solid Geometry, 44th Edition 2002, Charotar Publishing House.
5. James D. Bethune, Engineering Graphics with AutoCAD 2002, Publisher-Pearson Education.
6. P.S.Gill, engineering Graphics and Drawing, S.K.Kataria and Sons Millennium Edition.
7. T. Jeyapoovan, Engineering Graphics using AUTOCAD 2000, 1st Edition 2002, Vikas Publishing House.
8. K. Venugopal: Engineering Drawing and Graphics + AutoCAD 4th Edition, New Age International Publishers Ltd. New Delhi.

Communication & Professional Skills in English (HU-1003)

Course Code	HU-1003	Credits-4	L-3, T-1, P-0
Name of the Course	Communication & Professional Skills in English		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E.

Section A

Reading Skills: The skill of effective reading – eye movements, fixations, regression and visual wandering, the right approach to reading; Factors affecting the style of reading – reader related material related and environmental; Memory, retention, association of read material.

Kinds of Reading: Introduction to phonetics – familiarization with speech sound and their symbols – articulation of speech sounds – stress and intonation.

Grammar: Word building use of punctuation marks, articles, tenses, abbreviations, prepositions, idioms & phrases transformation of sentences, incorrect to correct English, single word for a group of words.

Section B

Writing Skills: Business letters: principles, structure and style of writing business i.e., sales letters, claim and adjustment letters, inviting quotations/tenders, writing a memo, job application letters, preparing a personal resume; Effective Meetings: Qualities i.e. planning, processing the discussion, conducting a meeting use of different type of questions, summaries, handling problem situations and problem people, writing notices, agenda and minutes of meetings; Report writing: Characteristics, types of reports, structure of technical/research reports, preparatory steps to report writing; Elements of style: Definition of style, characteristics of a good technical style – practical hints to improve the style of writing ; précis writing; Comprehension of passages (May be picked up from the books recommended for reading).

Section C

Listening Skills: Barriers to listening, effective listening and feedback skills, Telephone techniques. Considerations of listening and voice, developing telephone skills – preparing for the call, controlling the call follow up action. Handling difficult calls and difficult callers.

Section D

Speaking And Discussion Skills: Effective speaking: Preparation i.e., deciding the objective, preparing the environments, organizing the material selection of words, voice modulation, speed, expression, body language, dealing with questions, dealing with nervousness, presentation of

audio-visual aids; Group Discussions: The art of participating in group discussion i.e., initiative, cooperation with group members, analysis of the issue, putting one's views effectively, establishing leadership.

Assignments / Seminars / discussions may be given for following skill development.

a) Word processing a document
b) Report writing
c) Preparing agenda for meeting
d) Preparing minutes of the meeting / seminars.
e) Press Releases
f) Preparing a Brochure
g) Advertisements
h) Preparing a power point slide show on a PC / OHP
i) Any other exercise decided by the course Professor.

Recommended Books:

1. Sheila HA Smith, M and Thomas, L., Methuen, Reading to Learn; London, 1982.
2. McGraw, SJ;Basic Managerial Skills for all, Prentice Hall of India, New Delhi 1991
3. Technical Reporting Writing British Association for commercial and Industrial Education, BACIE, 1992
4. Chrissie Wright (Ed.); Handbook of Practical Communication Skills; JAICO Books
5. K.K.Sinha, Business Communication, Galgotia Publishing Company, New Delhi, 1999.
6. English Grammar
7. David Cameron, Mastering Modern English.
8. Robert L. Shuster, Written Communication in Business.
9. Ron Ludlow & Ferous panton. The Essence of Effective Communication.
10. Ragmond & Petit, business Communication.
11. Common Errors in English, by Sudha Publication (P) Ltd., B-5, Prabhat Kiran Building, Rajendra Place, New Delhi – 110008.
12. Abul Hashem, Common Errors in English, Ramesh Publishing House, Daryagang New Delhi.
13. Objective English by Tata McGraw Hill Publishing Co. Ltd., New Delhi.
14. R.K.Bansal & J.B. Harrison, spoken English for India, Orient Longman.
15. Veena Kumar, The Sounds of English, Makaav Educational Software, New Delhi.
16. R.C.Sharma & Krishna Mohan, Business Correspondence and Report writing, Tat McGraw Hill Publishing Co. Ltd., New Delhi
17. Group Discussion by Sudha Publications and Ramesh Publishing House, New Delhi.

Recommended Readings

1. Business @ The Speed of thought, Bill Gates.
2. My Experiments with Truth, M.K.Ghandhi
3. Wings of Fire, A.P.J. Kalam
4. An Autobiography, Jwahar Lal Nehru.

Basic Electronics (EC – 1001)

Course Code	EC -1001	Credits-4	L-3, T-1, P-0
Name of the Course	Basic Electronics		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section -A

Brief review of Band Theory, transport phenomenon in semiconductors, Electrons and holes in Intrinsic semiconductor, Donor and acceptor Impurities, charge densities in semiconductor.

PN Junction, Reverse and Forward bias conditions, Diode Characteristic and parameter, Ideal vs. Practical diode.equivalent circuits and frequency response. rectification-half and full wave, Zener and Avalanche diode, its role as regulator, photodiode.

Section B

Bipolar junction transistor (BJT) and their characteristics as circuit and gain elements.

Two port network analysis, h-parameters and trans-conductance. Equivalent circuits for JFET and MOSFET, enhancement mode and depletion mode MOSFETS.

Unijunction transistor (UJT), UJT characteristics, parameters and circuit operation.

Section C

Bias for transistor amplifier: fixed bias, emitter feed back bias. Feedback principles. Types of feedback, Stabilization of gain, reduction of non-linear distortion, change of inputs and output resistance by negative feedback in amplifier. Amplifiers coupling, types of coupling, Amplifier pass band, Eq circuits for BJT at high frequency response of CE, RC-Coupled amplifiers at mid, low and high frequencies.

Section D

Semi conductor processing, active and passive elements, Integrated circuits, bias for integrated circuits. Basic operational amplifier, applications of operational amplifier – adder, subtractor, Integrator, differentiator and comparator, Photo transistor: its characteristics and applications.

Reference Books:-

1. A.P.Malvino.Electronic Principles.
2. J.D. Ryder Electronic Fundamentals and Applications.
3. J.Millman and C.C.Halkias Electronic Circuits & Devices.
4. J.Millman & C.C.Halkias Integrated Circuits & Devices.
5. N.N.Bhargava & Kulshrestha, Electronic Devices.

Introduction to Computer & Programming in C (CS-1001)

Course Code	CS-1001	Credits-4	L-3, T-1, P-0
Name of the Course	Introduction to Computer & Programming in C		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section A

Fundamental Computer Concept: Operating system fundamentals, disk basics, VDU Basics, Keyboard basics, introduction to compiler, interpreter, assembler, linker and loader and their inter relationship, Introduction to basics of Information Technology.

Section B

Problem solving with Computers: Algorithms, pseudo codes and Flowcharts, Debugging, testing and documentation, structure-programming concepts, top down and bottom-up design approaches. Data types, Constants, variables, arithmetic and logical expressions, data inputs and output, assignments statements, conditional statements.

Section C

Iteration, arrays processing, use-defined data types, functions, recursion, parameter passing by reference and by value.

Section D

Structure, Multiple structures, Arrays of structure, Unions,

Files: reading, writing text and binary files, pointers, character pointers, pointers to arrays, arrays of pointer to structures.

(The programming language C is to be taught along with the course in detail.)

Books:

1. Kanitkar, “Let us C”, BPB Publications
2. Richie and Kerningham, “C Programming”
3. V Rajaraman “Fundamentals of computers”
4. D.Dromey, “How to solve it by computers” (Prentice Hall)
5. E. Balaguruswamy, “Programming in C”, Tata McGraw Hill.

Applied Physics Lab (AS-1003)

Course Code	AS-1003	Credits-2	L-0, T-0, P-2
Name of the Course	Applied Physics Lab		
Lectures to be Delivered	26 hours of Lab. work (2 hrs. per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

(i) Performing a practical exercises assigned by the examiner (25 marks).

(ii) Viva-voce examination (25 marks)

Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.

List of Experiments

Note: (Two experiments to be done from each section, total number of experiments required to be performed 10 to be decided by the teacher concerned and availability of equipment.)

Section A

1. To find the wavelength of sodium light by Newton's rings experiment.
2. To find the wavelength of sodium light by Fresnel's Biprism experiment.
3. To find the wavelength of sodium light by using the phenomenon of diffraction of light at a straight edge.
4. To find the wavelength of various colors of white light with the help of a plane transmission diffraction grating.
5. To find the wavelength of sodium light by Michelson interferometer.

Section B

1. To find the refractive index and Cauchy's constant of a prism by using spectrometer.
2. To find the resolving power of a telescope.
3. To study the beam parameters of a helium-neon laser.
4. To find the specific rotation of sugar solution by using a polarimeter.
5. To find the velocity of Ultrasonic Waves in a given liquid.
6. To find the specific rotation of sugar using polarimeter

Electricity and Magnetism

Section C

1. To compare the capacitances of two capacitors by De'sauty Bridge.
2. To find the flashing & quenching potentials of argon & also to find the capacitance of unknown capacitor.
3. To find the temperature coefficient of resistance by using platinum resistance thermometer and Callender & Griffith bridge.

Section D

1. To find the frequency of AC mains by using sonometer.
2. To find the low resistance by carrey – Foster's bridge.
3. To find the resistance of a galvanometer by Thomson's constant deflection method using a post office box.

4. To find the value of high resistance by Substitution method.
5. To find the value of high resistance by Leakage method.
6. To convert a galvanometer into an ammeter of a given range.
7. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
8. To find the reduction factor of two turn coil of tangent galvanometer by using a copper voltammeter.

Modern Physics:

Section E

1. To find the value of e/m for electrons by Helical method.
2. To determine the charge of an electron by Millikan's oil drop method.
3. To find the ionization potential of Argon. Mercury using a thyratron tube.
4. To find the value of Planck's constant by using a photoelectric cell.

Section F

1. To study the various crystal structures using Beed Model.
2. To calculate the hysteresis loss by tracing a B-H curve for a given sample.
3. To determine the band gap of an intrinsic semiconductor by four probe method.
4. To determine the resisitivity of a semi-conductor by four probe method at different temperatures.
5. To determine the Hall co-efficient.
6. To study the photovoltaic cell & hence to verify the inverse square law.

Books:

1. Practical Physics-S.L.Gupta & V.Kumar.
2. Advanced Practical Physics Vol. I & II – S.P. Singh
3. Practical Physics for B.Sc I, II and III - C.L.Arora.

Basic Electronics Lab (EC-1002)

Course Code	EC-1002	Credits-2	L-0, T-0, P-2
Name of the Course	Basic Electronics Lab		
Lectures to be Delivered	26 hours of Lab. work (2 hrs. per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Laboratory Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

(i) Performing a practical exercises assigned by the examiner (25 marks).

(ii) Viva-voce examination (25 marks)

Viva-voce examination will be related to the practical performed / project executed by the candidate related to the paper during the course of the semester.

List of Experiments:

1. (a) To study the use and scope of using an oscilloscope as a measuring device in an electronic laboratory.
   (b) To study the use and scope of using a millimeter (digital and analog) as a measuring device in an electronics laboratory.
   (c) To study the use and scope of function generator as a signal source in an electronics laboratory.

Set up an experiment to:

2. Draw forward bias and reverse bias characteristics of a p-n junction diode and use it as a half wave and full wave rectifier.
3. Draw the characteristics of a zener diode and use it as a voltage regulator.
4. Draw characteristics of common base configuration of p-n-p transistor.
5. Draw characteristics of common emitter configuration of an npn transistor.
6. Draw characteristics of common drain configuration of a MOSFET.
7. Find the voltage and current gain of single stage common emitter amplifier.
8. Draw the characteristics curve of UJT.
9. Find the voltage gain of single stage voltage series feedback amplifier.
10. Use operational amplifier as
    I) Inverting amplifier
    II) Non-inverting amplifier
    III) Comparator
11. Use operational amplifier as
    I) Integrator
    II) Differentiator
12. Use operational amplifier as
    I) Adder
    II) Precision amplifier
13. Find the overall voltage gain and current gain of a two stage RC coupled amplifier.

Basic electronics should stress on interfacing with real life devices and general-purpose linear units. Emphasis is on system design and not on discrete components, some of the components around which exercises can be built are

1. SCR as triacs and power control.
2. Power supplies starting with zener.
3. Op to compliers and isolations where photo diode, transistors, leds are used.
4. Laser diode (laser pointer)
5. Op amps
6. Op amps for instrument amplifiers.

Note: - Record to be maintained in the laboratory record book for evaluation. Usage of breadboard approach to be encouraged.

Workshop Practice-I (ME-1002)

Course Code	ME-1002	Credits-3	L-0, T-0, P-3
Name of the Course	Workshop Practice-I		
Lectures to be Delivered	39hrs. (Lab Session=13(3 hrs. each))		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Laboratory Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

(i) Performing a practical exercises assigned by the examiner (25 marks).

(ii) Viva-voce examination (25 marks)

Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.

List of Experiments: -

Fitting Shop: -

Introduction to the tools used in Fitting Shop and various processes in Fitting shop.

1. To make a square piece of mild steel.
2. To make V-matching joint of mild steel.
3. To make a V-notch.

Machine Shop: -

Introduction to various machine tools and machine parts, such as Lathes, drilling machine, grinders etc. Cutting tools and operations.

1. Facing and turning on mild steel rod on Lathe Machine.
2. To make a groove on lathe machine.
3. Taper turning operation on Lathe Machine.

Carpentry and Pattern making Shop: -

Carpentry and Pattern Making Various types of timber and practice boards, defects in timber, seasoning of wood, tools, operations and joints. Introduction to the tools used in carpentry shop.

1. To make the 'T' lap joint.
2. To make 'T' Dove-tail joint.
3. To make Mortise & Tennon joint.

Welding Shop: -

Introduction to different welding methods, welding equipment, electrodes, welding joints, awareness of welding defects.

1. To make a lap joint.
2. To make a T joint.
3. To make a V-butt joint.

Smithy and Forging: -

Introduction to forging tools, equipments and operations, Forgability of metals.

1. To make a ring of mild steel by cold forging process.
2. To make S-hook by hot forging process.
3. To make chisel by hot forging process.

Foundry Shop: -

Introduction to moulding materials, moulds, use of cores, melting furnaces, tools and equipment used in Foundry.

1. Make a single piece pattern mould.
2. To make spilt pattern mould.
3. To make mould and core and assemble it.

Electrical and Electronics Shop: -

1. Introduction to electric wiring.
2. Exercises preparation of PCBs, involving soldering of electrical & electronic application.

Books: -

1. Workshop Technology by Chapman.
2. Manufacturing Processes by Begman.
3. Manufacturing Materials and processes by JS Campbell.

Note: - Industrial visits can be undertaken to various industries available in the vicinity of the concerned Engineering College. One project at the end of semester has to be submitted by a group of six students.

Information Technology Trainer Workshop-I (IT-1001)

Course Code	IT-1001	Credits-3	L-0, T-0, P-3
Name of the Course	Information Technology Trainer Workshop-I		
Lectures to be Delivered	39 Hrs. (Lab Session = 13(3 hrs. each))		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Laboratory Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

(i) Performing a practical exercises assigned by the examiner (25 marks).

(ii) Viva-voce examination (25 marks)

Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.

The workshop will provide training of hardware and software theory of a computer based on Pentium-IV CPU with windows 98 as an operating system with DMP/ DeskJet Printer/ Laser Printer.

(i) Study of Computer Mother Board: -

a) CPU, DMA, Wait state, RAM / ROM, NMI, Logic Address, reset, I / O Ports, Device Drivers, Power Management, Block Diagram.

(ii) Study of bus, Slots and Ports: -

a) ISA, EISA, VESA, PCI, MCA, AGP, USB, AMR
b) Parallel, Serial – RS 232C, USB

(iii) Study of Memories on a PC: -

a) Memory – Types, Selection, Installation
b) ROM BIAS – Types, Setup, Installation
c) Floppy Drive – Types, R/W head, Control Card, Spindle Motor, Stepper Motor, Termination Resistor, Block Diagram, Write protect, Testing.
d) Hard Disk – Jumper Setting, Configuration, HDC, Installation Software, Testing, Block Diagram.

(iv) Study of Input/Output Device: -

a) Monitor – Types, Working principle, Configuration, modes, scanning, Block diagram Adapter
b) Card – Types, Dot pitch, Resolution.
c) Keyboard – Types, Construction, Working Principle.
d) Mouse – Types, Construction, Working Principle.

(v) Study of Hardware, Accessories (Mechanical / Electrical): -

a) Cabinet – Types, Selections
b) SMPS – Rating, Green PC, EPA Compliance
c) Cables – HD Cable, FDD Cable, Printer Cable.

d) Connectors – 9 pin M/F, 25 Pin M/F

(vi) Study of Printers: -

a) Printers – Types, construction, working Principle, Fonts, DeskJet, Dot Matrix, Laser Jet, Line Printer, Plotters, Block Diagram

(vii) Study of Multimedia Hardware Modules

a) CDROM drive – Jumper setting, Installation, Cables, Block Diagram, Configuration.
b) DVD drive – Types, Working Principle, Installation, Configuration
c) Speakers/Mike – Different Types
d) Tuner Cards – Different Types
e) Digital Cameras – Different Types
f) Video Conferencing Kit.

(viii) Study of Clean Power Supply Equipments: -

a) CVT's
b) UPS

Note: - Industrial visits can be undertaken to various industries available in the vicinity of the concerned Engineering College. One project at the end of semester has to be submitted by a group of six students.

Computer Programming Lab. (CS -1002)

Course Code	CS -1002	Credits-2	L-0, T-0, P-2
Name of the Course	Computer Programming Lab.		
Lectures to be Delivered	26 Hrs. of Lab. Work (2 hrs. per week)		
Semester End Examination	Max Marks: 50	Min Pass Marks: 20	Maximum Time: 3 hrs
Laboratory Continuous Assessment	Lab work 30% Lab Record 25% Viva/ Hands on 25% Attendance 20%	Max Marks: 50	Min Pass Marks: 25

Instructions for paper setter / candidates

Laboratory examination will consist of two parts:

(i) Performing a practical exercises assigned by the examiner (25 marks).

(ii) Viva-voce examination (25 marks)

Viva-voce examination will be related to the practicals performed / project executed by the candidate related to the paper during the course of the semester.

A. Dos 6.2 (through MS-DOS prompt, usage of basic commands, idea of .bat, .sys, .com, .exe etc.and usage of an editor to be done in consultation with the faculty incharge for the course).

B. Windows (usage of GUI for working effectively in laboratory to be done in consultation with the faculty incharge for the course).

C. Microsoft office (projects based on word, excel, power point, access, to prepare reports, presentations and databases to be done in consultation with the faculty incharge for the course).

D. Programming of fundamental algorithms in C in the form of projects in groups of two (based on how to solve it, Dromey and let us C by Kanitkar and in consultation with the faculty incharge for the course).List of Lab. exercises to be displayed in advance covering whole of the course. Tentative list is given below to be developed in the form of projects. 10 more exercises to be added by the faculty incharge.

1. Write a program to find the largest of three numbers (if-then-else).
2. Write a program to find the largest number out of ten numbers (for statement).
3. Write a program to find the average male height & average female heights in the class (input is in form of sex code, height).
4. Write a program to find roots of quadratic equation using functions and switch statement.
5. Write a program using arrays to find the largest and second largest no.
6. Write a program to multiply two matrices.
7. Write a program to read a string and write it in reverse order.
8. Write a program to concatenate two strings.
9. Write a program to sort numbers using the Quick sort Algorithm.
10. Represent a deck of playing cards using arrays.

Note: -Record to be maintained both electronically and hard copy for evaluation.

Group – B

APPLIED MATHS – II(AS – 1006)

Course Code	**AS – 1006**	Credits : 4	L-3, T-1, P-0
Name of the Course	**APPLIED MATHS – II**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Vector Calculus: Curves, arc length, tangent, curvature and torsion, Directional derivative, Gradient of a scalar field, divergence and curl of a vector field. Line, surface and volume integrals, theorem of gauss, Stoke's and Green's (proofs not needed), consequences and applications.

SECTION – B

Integral Transforms: Fourier series, Euler's formula, even and odd functions, half range expansions. Fourier integral. Fourier and Laplace transform, Inverse transform of derivatives and integrals, shifting theorem, application to periodic functions, unit step function, impulse function.

SECTION – C

Second order Differential Equations: Solution by: Power series method and its basis, Solution of Bessel and Legendre differential equations, properties of Bessel and Legendre functions.

SECTION – D

Partial Differential Equations (PDE): Formulation and classification. Solution of wave equation heat equation in one dimension and Laplace equation in two dimesion by the method of separation of variables.

Books:

1. E.Kreyszig, Advanced Engineering Mathematics (Wiley Eastern Pvt. Ltd.).
2. S.S.Sastri, Engineering Mathematics (2^{nd} edition) Vol-I and Vol-II.
3. B.S.Grewal, Higher Engineering Mathematics.
4. Piskunov, Differential and Integral Calculus.
5. R.K.Jain and S.R.K.Iyengar, Advanced Engineering, Mathematics.
6. Michael d.Greenberg, Advanced Engg. Mathematics.

APPLIED PHYSICS– II(AS – 1007)

Course Code	**AS – 1007**	Credits : 4	L-3, T-1, P-0
Name of the Course	**APPLIED PHYSICS – II**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Crystal Structure: Space lattice, unit cell and translation vector, miller indices, Simple crystal structure, bonding in solids, Experimental x-ray diffraction method, laue method, powder method.

Free electron theory: Elements of classical free electron theory and its limitations. Quantum theory of free electrons, Fermi level, density of states, fermi dirac distribution function, Thermionic emission, Richardson's equation.

SECTION – B

Band Theory of Solids: Origin of energy bands, kronig, Penney Model (qualitative), E-K diagrams, Brillouin Zones, Concept of effective mass and holes, Classification into metals, semiconductors and insulators, fermi energy and its variation with temperature.

SECTION – C

Photoconductivity & Photovoltaic: Photoconductivity in insulating crystals, variation with illumination, Effect of traps, application of photoconductivity, Photovoltaic cell and their characteristics.

Properties of Solids: Atomic Magnetic Moments, Orbital Diamagnetism, Classical Theory of Para magnetism, Ferromagnetism Molecular Field theory and domains, Magnetic circuit. Its comparison with Electric circuit and its applications, Super Conductor (Introduction, Types and Applications) Hall Effect.

SECTION – D

Laser: Spontaneous and stimulated emission, Laser action, Characteristics of Laser Beam – Concept of coherence, Types of lasers based on pumping techniques, He-Ne Laser, Semiconductor Laser (simple Ideas) with applications.

Fiber Optics: Optical communication: Communication through open space, optical wave guides with special reference to Propagation of light in Fibres, Numerical Aperture, single mode and multi mode Fibers, applications.

Books:

1. Charles Kittel: Introduction to Solid State Physics.
2. B.S.Saxena, R.C.Gupta & P.N.Saena: Solid state Physics.
3. M.B.Avadhanulu & P.G.Kshirsagar, A text book of Engineering Physics.
4. Arthur Beiser, concepts of Modern Physics, 5^{th} International edition Tata McGraw Hill.
5. A.J.Dekkar, Introduction to solid state Physics.

CHEMISTRY(AS – 1004)

Course Code	**AS – 1004**	Credits : 4	L-3, T-1, P-0
Name of the Course	**CHEMISTRY**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Thermodynamics: Second law concept of Entropy, Entropy change for an ideal gas, free energy and work functions, Free energy change Gibb's Helmholtz equation, Clausius – Clapeyron equation, Related numerical problems with above topics.

Phase Rule: Introduction, One Component System, Two components System (Water, Sulphur and Alloy System), thermal Analysis, auxiliary.

SECTION – B

Water Treatment: Introduction, Sources of water, Impurities , Hardness Analysis, Oxidations, (BOD & COD), Boiler Corrosion Sewage & Treatment.

Pollution and Control: Introductions, causes/reasons, types of pollutions, air, water, soil and radioactive pollution and controls.

Corrosion and its Controls: Introduction, Types of corrosions, Electrochemical Theory, Pitting, Water Line, Differential Aerations corrosions, Stress Corrosions, Factors affecting Corrosions, Preventive measures.

SECTION – C

Lubricants: Introductions, Frictions and Wear, Lubricants, Mechanism of Lubrications, Base oil, Additives, Greases and Emulsions.

Fuel and Combustion: Introduction, class of fuels (Solid, Liquid and Gases) Coal and its origin, Analysis of Coals, Petroleum fuels, Crude Petroleum and its refining, Cracking, Hydofinishings and Diesel, Kerosene, Gesoline as fuel. Gaseseous fuel, Water Gas, Bio-Gas, nuclear Fuel, Breeder Reactor.

SECTION – D

Solid State Chemistry: Introduction, Lattices and Periodicity, Elements of Band Theory, Conductors, Insulators and Semi-Conductors, Structure Determination by I.R.NMR, X-Ray UV, Mass Spectroscopy.

Catalysis: Introduction, criteria of Catalysts, Types of Catalyst, Enzyme Catalysis, Mechanism of Catalysis (Homogeneous & Heterogeneous Catalysis).

BOOKS:

1. Engineering Chemistry: By P.C.Jain & Monika Jain, Dhanpat Rai and Sons.
2. A Text Book of Engineering Chemistry: By Shastri Chawla, Dhanpat Rai & Sons.
3. Physical Chemistry: By R.P.Verma, Pardeep Publishers Jallandhar.
4. Principles of Physical Chemistry: By Puri, Sharma, Pathania, Shobhan Lal Nagin Chand & Co.
5. Chemistry in Engineering & Technology, Vol.I & Vol.II, Rajaram, Kuriacose (TMH).
6. Physical Chemistry, P.W.Atkin (ELBS, Oxford Press)
7. Physical Chemistry, W.J.Moore (Orient Longman)

FOUNDATION OF INFORMATION TECHNOLOGY(IT – 1002)

Course Code	**IT – 1002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**FOUNDATION OF INFORMATION TECHNOLOGY**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Information concept and Processing: Definition of Information, Need for Information, Quality of Information, Value of Information, Categories and Levels of information in Business Organization, Data concepts and Data Processing, data representation – Number system.

Computer Appreciation: Definition of an Electronic Digital Computer, history, Generations, Characteristics and applications of Computers, classification of Computers.

Elements of Computers Processing System: Hardware CPU, Peripherals, Storage Media, Software Definition, Role and Categories, Firmware and Human ware.

SECTION – B

Communication: Need for communication, Data Transmission, Baud, Bandwidth, Data transmission rate, Channel Capacity, transmission impairments, Signal noise ratio.

Transmission media (twisted cables, Micro wave and radio wave, Optical fiber and satellite) and communication through these media.

A/D and D/A, Modulation, Multiplexing-FDM, TDM.
Communication techniques: circuit switching, message switching and packet switching and their advantages and disadvantages.

SECTION – C

Networking Essentials: Networking of Computer – Introduction of LAN and WAN, Types of LAN, Basic ISO-OSI model of LAN, client – Sever Architecture's.

Programming Language Classification: Computer Languages, Generation of Languages, Translators – Interpreters, Compilers, Assembles, Introduction to 4GLS.

SECTION – D

Information Technology Applications: Multimedia introduction, tools graphics, sound, video and animations. Artificial intelligence (AI) – Basic concepts of AI and Expert systems.

Latest IT enabled business applications: Basic concepts with definitions and short introduction of Enterprise Resource Planning (ERP), Customer relationship Management (CRM) Supply Chain Management (SCM), E-Commerce. Awareness of Ongoing IT Projects in India such as NICNET, ERNET, INFLIBNET etc.

Books:

1. Rajaram,V.: Introduction to Computer.
2. Morris: Computer Organisation.
3. Hamacher: Computer Organisation.
4. Kanter: Managing Information System.
5. Vital N: Information Technology India Tomorrow.
6. Murthy C.S.V: Fundamentals & Information Technology.

SCIENCE, TECHNOLOGY AND SOCIETY (HU – 1002)

Course Code	**HU – 1002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**SCIENCE, TECHNOLOGY AND SOCIETY**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

For Paper Setters: The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

For candidates: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

1. Science, Technology and Engineering, as knowledge and as social and professional activities.
2. Inter-relationship of technology growth and social, economic and cultural growth: historical perspective.
3. Ancient, medieval and modern technology/Industrial revolution and its impact. The Indian Science and Technology.

SECTION – B

1. Social and Human critiques of technology: Mumford and Ellul.
2. Rapid technological growth and depletion of resources. Reports of the club of Rome.
3. Energy crisis; renewable energy resources.

Environmental degradation and pollution. Eco-friendly technologies. Environmental regulations. Environmental ethics.

SECTION – C

1. Technology and the arms race. The nuclear threat.
2. Appropriate technology movement Schumacher; later developments.
3. Technology and the developing nations. Problems of technology transfer. Technology assessment/impact analysis.
4. Human operator in Engineering projects and industries Problems of man machine interaction. Impact of assembly line and automation. Human centered technology.

SECTION – D

1. Industrial hazards and safety. Safety regulations. Safety Engineering.
2. Politics and technology. Authoritarian versus democratic control of technology. Social and ethical audit of industrial organizations.
3. Engineering profession. Ethical issues in Engineering practice, Conflicts between business demands and professional ideals. Social and Ethical responsibilities of the engineer. Codes of professional ethics. Whistle blowing and beyond. Case studies.

BOOKS:

1. Appleyard, R.ed. 1989. the impact of international migration on developing countries paris: OECD.
2. Barger, Bernard 1952 science and the social order New York: Free Press.
3. Gaillard, J 1991. Scientists in the third world Lexington: Kentucky University Press.
4. Gaillard, J., V.V.Krishna and R.Waast, eds. 1997. Scientific communities in the developing world New Delhi: Sage.
5. Kamala Cahubey ed. 1974. Science policy and national development New Delhi: Macmillan.
6. Krishna, V.V.1993. S.S.Bhatnagar on science, technology and development 1938-54 New Delhi: Wiley Eastern.
7. Kornhauser, William, 1962 Scientists in industry, Berkley; University of California Press, price, Derek J.dSolla, 1963 little science, big science New York Columbia University Press.
8. Rahman, A.1972 Trimurti: Science, Technology and society – A collection of essays New Delhi: Peoples Publishing House.
9. Storer, Norman W.1966. The social system of science New York: Holt Rinehart and Winston.
10. UNCTAD/CSIR Case study in reverse transfer of technology: A survey of problems and policy in India Doc. TD/B/C.6AC.4/6 and Corr.1, Geneva.
11. Crane, Diana. 1965. "scientists at major and minor universities: A study of productivity and recognition'" American sociological review, 30 (5) , Pp. 699-714.
12. Coler, Myron A.ed 1963 Essays on the creativity in the sciences New York: New York University Press.
13. Debroy, Bibek. 1996. Beyond the Uruguay round: The Indian perspective on GATT New Delhi: Sage.
14. Gilpin, Robert, and Christopher Wright eds. 1964. Scientists and national policy making New York: Columbia University Press.
15. Kumar, Nagesh and N.S.Siddharthan. 1997. Technology, market structures and internationalization: Issues and policies for developing countries London: Routlege and the united National University.
16. MacLeod, Roy and Deepak Kumar, 1995. Technology and the raj: Western technology and technical transfers to India, 1700-1947 New Delhi: Saga.
18. Merton, Robert K.1938. "Science, technology and society in seventeenth – century England" Osiris (Bruges, Belgium), 14 Pp.360-632.

BASIC ELECTRICAL ENGINEERING (EE – 1001)

Course Code	**EE – 1001**	Credits: 4	L-3, T-1, P-0
Name of the Course	**BASIC ELECTRICAL ENGINEERING**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A:

D.C. circuits: Ohm's law, Kirchoff's Laws, Thevenin's, Norton's, superposition theorem, Maximum power transfer theorem, Reciprocity, Compensation, Millman and Tellegan's Theorem . D.C. circuits, Nodal and Mesh analysis.

A.C. circuits: Sinusoidal signal, instantaneous and peak values, RMS and average values, phase angle, polar and rectangular, exponential and trigonometric representations RL and C components, behavior of these components in A.C. circuits, concept of complex power, power factor.

Transient Response: transient response RL, RC and RLC circuits with step input.

Section B:

Series and Parallel A.C. circuits: Series and Parallel A.C. circuit, Series and Parallel resonance. Q factor, cut off frequency and bandwidth.

Three phase circuits: Phase and line voltages and currents, balanced star and delta circuits, power equation, measurement of power by 2-wattmeter method, importance of earthling.

Section C:

Transformers: Principle, construction and working of transformer, Efficiency and regulation.

Electrical Machines: Introduction to D.C. Machines, induction motor, Synchronous machines.

Section D:

Measuring Instruments: Voltmeter, Ammeter, Wattmeter, Energy meter.

Batteries: Storage batteries:- Types, construction, charging and discharging, capacity and efficiency.

Books:

1. Kothari & Nagarath: Basic Electrical Engg. (2^{nd} Edition), TMH.
2. B.L. Theraja & A.K. Theraja, S.Chand: Electrical Technology(Vol-1).
3. Deltoro: Electrical Engg Fundamentals, PHI.

BASIC MECHANICAL ENGINEERING(ME – 1003)

Course Code	**ME - 1003**	Credits: 5	L-4, T-1, P-0
Name of the Course	**Basic Mechanical Engineering**		
Lectures to be delivered	**65 (1 Hr Each) (L =52, T = 13 for each semester)**		
Semester End Examination	**Maximum Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

First Law of Thermodynamics

Essence and corollaries of the first law, analytical expressions applicable to a process and cycle, internal energy, enthalpy and specific heats, first law analysis of steady flow, applications of steady flow energy equation to engineering devices.

Applications of first law of Thermodynamics

Closed and open systems, analysis of non-flow and flow processes for an ideal gas under constant volume (Isochoric), constant pressure (Isobaric), constant temperature (Isothermal), adiabatic and polytropic conditions. Analysis of free expansion and throttling processes. Representation of these processes on P-V charts and analysis of property changes and energy exchange (work and heat) during these processes.

SECTION – B

Second Law of Thermodynamics

Limitations of first law, various statements of second law and their equivalence, application of statements of second law to heat engine, heat pump and refrigerator. Philosophy of Carnot cycle and its consequences. Carnot theorem for heat engines and heat pump. Classius inequality, concept and philosophy of entropy and entropy changes during various processes. Temperature – entropy chart and representation of various processes on it. Third law of thermodynamics.

SECTION – C

Simple Stresses & Strains

Concept & types of Stresses and strains, Poisson's ratio, stresses and strain in simple and compound bars under axial loading, stress strain diagrams, Hooks law, Elastic constants and their relationships. Temperature stress and strain in simple and compound bars under axial loading, Numerical problems.

Shear Force and Bending Moments

Definitions, SF & BM diagrams for cantilevers, simply supported beams with or without over-hang and calculation of maximum BM and SF and the point of contraflexture under (i) concentrated loads, (ii) uniformly distributed loads over whole span or a part of it, (iii) combination of concentrated loads and uniformly distributed loads. Relation between the rate of loading, the shear force and the bending moments, Numerical Problems.

SECTION – D

Bending Stresses in Beams

Bending Stresses in Beams with derivation of Bending equation and its application to beams of circular, rectangular I & T Section, Composite beams, stress in beam with derivation, Combined Bending , Torsion & Arial loading of beams , Numerically .

Torsion of Circular Members

Design of thin Circular Tubes, Torsion of Solid and hollow circular shafts, Combined bending and torsion, Equivalent torque, Numerical Problems.

Text Books

1. Nag, P.K., "Engineering Thermodynamics", Tata McGraw – Hill, New Delhi.
2. Yadav, R., Thermal Science and Engineering, Central Publishing House, Allahabad.
3. Strength of Materials – G.H.Ryder – Third Edition in S I units 1969 Macmillan India.
4. Mechanics of Materials – Dr. Kirpal Singh, Standard Publishers Distributors, New Delhi.

Reference Books

1. Strength of Materials – Popoy, PHI, New Delhi.
2. Strength of Materials – Sadhu Singh, Khanna Publications.
3. Strength of Materials – A Rudimentary Approach – M.A.Jayaram, Revised Ed. 2001, Sapna Book House, Bangalore.
4. Strength of Materials – U.C.Jindal
5. Moran, M.J. and Shapiro, H.N., Fundamentals of Engineering Thermodynamics, John Wiley, New York.
6. Van Wylen, G.J., Fundamental of Classic Thermodynamics, John Wiley, New York.
7. Spalding, D.B. and Cole, E.H., Engineering Thermodynamics, ELBS, New Delhi.
8. Hibbeler, R.C. Engineering Mechanics – Statics, Addison Wesley Longman, New Delhi.

APPLIED CHEMISTRY LAB (AS – 1005)

Course Code	**AS – 1005**	Credits : 2	L-0, T-0, P-2
Name of the Course	**APPLIED CHEMISTRY LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

NOTE: At least 8 experiments to be performed.

List of Experiments

1. To determine the surface tension of the given liquid by drop number method by using Stalgmometer and identify the given liquid.
2. To determine the insoluble, soluble and total solids in given sample of sewage.
3. To determine the solid carbon, volatile matter, ash content and percentage of moisture in given sample of coal by proximate analysis method and classify the coal.
4. To determine the total alkalinity in a given sample of water using a standard acid. Ask for what you want
5. To determine the percentage of Chlorine in a given sample of $CaOCl_2$ which has been dissolved in one litre of solution..
6. To determine the surface tension of the two given unknown liquids by using Stalgmometer and identify the given liquid.
7. To determine the fineness of a given sample of cement by solving through standard 75:90 micro sieve.
8. To determine the coefficient of viscosity of the given unknown liquids by using Ostwald's Viscometer and identify the given liquid.
9. To determine the coefficient of viscosity of the given lubricating oil using Red Wood Viscometer
10. To determine the coefficient of viscosity of the given lubricating oil using Seybolt Viscometer.
11. To determine the flash point and fire point of given sample of oil using Pens key Marten's apparatus.
12. To determine the amount of Chlorine in given sample of water approximate N/20 sodium Thiosulphate solution. Ask for your requirement.
13. Estimation of calcium as CaO volumetrically in cement
14. To determine the maximum wavelength of solution of cobalt chloride
15. To determine the Beer's Law and apply it to find the concentration of given unknown solution by spectra-photometer.
16. To determine the chemical oxygen demand of waste water.
17. To determine the half-life period of given radioactive sample using GM counter.

MAT LAB (IT– 1003)

Course Code	**IT– 1003**	Credits : 2	L-0, T-0, P-2
Name of the Course	**MAT LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.
The aim of this laboratory is to help students get an idea about a programming environment very widely used by engineer to solve the problem in their respective disciplines.

Exercises on computer

i. Roots of a quadratic equation.
ii. Guessing a number
iii. Units conversion
iv. Factorial program
v. Simulation of RC circuit
vi. V-I characteristics of a MOSFET.
vii. Finding average with dynamic array.
viii. Writing a binary file
ix. Reading a binary file
x. Plotting one dimensional and two dimensional graph using MAT LAB 2-D plot types.
xi. Using functions in MAT LAB Environment

To teacher concerned will give at least 10 exercises to solve non trivial problems using MAT LAB environment.

BOOKS:

1. Programming in MAT LAB, Marc E.Herniter, Thomson ASIA Ptd. Ltd Singapore(2001)
2. MAT LAB, the languages of computing; The maths work inc.

BASIC ELECTRICAL ENGINEERING LAB (EE– 1002)

Course Code	**EE – 1002**	Credits : 2	L-0, T-0, P-2
Name of the Course	**BASIC ELECTRICAL ENGINEERING LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

1. To verify KCL and KVL.
2. TO study frequency response of series RLC circuit and determine resonance frequency and Q factor for various values of R,L,C
3. TO study frequency response of parallel RLC circuit and determine resonance frequency and Q factor for various values of R,L,C
4. To perform direct load test of transformer and plot efficiency v/s load characteristics.
5. To perform direct load test of the DC shunt generator and plot load v/s current curve.
6. To study and verify Thevenins, Norton's, superposition, Milliman's, maximum power, reciprocity theorems .
7. To perform O.C and S.C test of transformer.
8. to study various types of meters
9. Measurement of power by 3 voltmeter/ 3 ammeter method.
10. Measurement of power in 3-phase system by 2-wattmeter method.

WORKSHOP PRACTICE – II(ME– 1004)

Course Code	**ME– 1004**	Credits : 4	L-1, T-0, P-3
Name of the Course	**WORKSHOP PRACTICE –II**		
Lectures to be delivered	**52 hours**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

Fitting shop:-

1. Drilling and Tapping in M.S. piece
2. To make a male-female joint (taper type) of mild steel.

Machine Shop :-

1. To perform boring operation on lathe machine.
2. To perform knurling and threading operation on lathe machine.
3. step turning operation on a lathe machine

Carpentry and Pattern making shop:-

1. To make a single piece pattern of connecting rod.
2. To make a self cod pattern.
3. To make a split pattern.

Welding shop:-

1. To make V butt joint in horizontal position.
2. To make a V butt joint in vertical position.
3. To perform Gas welding operation.

Smithy and Forging:-

1. To make a cube from a circular bar.
2. To make a tong using hot forging operations
3. To perform drawing down operation.

Foundry Shop:-

1. To make a mould and perform casting operation.
2. Study of casting defects and remedies.

Books:

1. Workshop Technologies By Chapman
2. Manufacturing Processes by Begam
3. Manufacturing Materials And Processes By JS Campbell
4. Introduction To Electrical Wiring
5. Exercises And Prepration Of PCBs Involving soldering of electrical and electronic applications.

INFORMATION TECHNOLOGY TRAINER WORKSHOP II(IT – 1004)

Course Code	**IT – 1004**	Credits : 4	L-1, T-0, P-3
Name of the Course	**INFORMATION TECHNOLOGY TRAINER WORKSHOP II**		
Lectures to be delivered	**52 hours**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:
i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester

List of Experiments

This workshop will provide training of different types of operating systems (Windows98,LINUX) with hands on experiments on the following:

1. Installation of operating system.
2. Configuration of Hard Disk.
3. Configuration of Display Cards.
4. Configuration of sound cards.
5. Configuration of CDROM.
6. Configuration of Mouse.
7. Configuration of Printer.
8. Configuration of Display Cards.
9. Configuration of Network Cards.
10. Configuration of Modems.
11. Understanding Boot up process.
12. Creating and using emergency Disk.
13. Troubleshooting exercises related to various components of computer like Monitor drives, memory, printers etc.
14. Assembling a PC.

BASIC MECHANICAL ENGG. LAB(ME – 1005)

Course Code	**ME – 1005**	Credits : 2	L-0, T-0, P-2
Name of the Course	**BASIC MECHANICAL ENGG. LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 30%, Viva 30%, Attendance 10%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS

1. To study low-pressure boilers.
2. To study High-pressure boilers.
3. Calibration of thermometers.
4. Calibration of pressure gauges.
5. Study of discharge measuring devices.
6. To determine co-efficient of discharge of orifice meter.
7. To verify the Bernoulli's Theorem.
8. To find Young's Modulus of Elasticity using Searl's apparatus.
9. To find Young's Modulus of Elasticity of a beam with deflection beam apparatus.
10. To find Modulus of rigidity with the help of torsion apparatus.

SEMSTER-III

SEMESTER – III

Numerical Analysis & Computer Programming (AS (ID) – 3001)

Course Code	**AS (ID) – 3001**	Credits : 4	**L-3, T-1, P-0**
Name of the Course	**Numerical Analysis & Computer Programming**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

INTRODUCTION TO COMPUTER PROGRAMMING: Review of computer programming in C and C++ languages. Arithmetic expressions, simple programs. The emphasis should be more on programming techniques rather than the language itself.

FINITE DIFFERENCES & INTERPOLATION : Various difference operators and relation between them. Newton's forward and backward interpolation formulae. Central difference Interpolation formula. Gauss's forward and backward interpolation formulae. Lagrange's interpolation formula and Newton's divided difference formulae.

SECTION- B

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS : Bisection method, method of false position, secant method, Iteration method, Newton-Raphson method, Generalized Newton-Raphson method.

SOLUTION OF SIMULTANEOUS ALGEBRAIC EQUATIONS : Jacobi's method, Gauss-seidal method, relaxation method.

SECTION – C

NUMERICAL DIFFERENTIATION AND INTEGRATION : Formulae for derivatives. Trapezoidal rule, Simpson's $1/3^{rd}$ and $3/8^{th}$ rules, Boole's and Weddle's rules, Romberg's integration.

SECTION – D

NUMERICAL SOLUTION OF P.D.E.: Finite difference approximations of partial derivatives, solution of Laplace equation (Standard 5-point formula only) One-dimensional heat equation (Schmidt method, Crank – Nicolson DuFort method and Frankel method) and wave equation.

Text books:

1.Numerical Methods in Engg. & Sciences : B.S.Grewal : Khanna Publishers.

2.Numerical methods for Scientific & Engg. Computations : M.K.Jain, S.R.K.Iyengar & R.K.Jain; Wiley Eastern Ltd.

Reference books:

1. Computer Oriented Numerical methods : U.Rajaramanm Orebtuce; Hall of India.

2. Introduction to Numerical Analysis : C.E.Froberg; Addison Wesley.

NOTE: Students will be asked to write computer program of problems discussed in C/C++

SEMESTER – III

Principles of Engineering Economics and Management (AS (ID) – 3002)

Course Code	AS (ID) – 3002	Credits : 4	L-3, T-1, P-0
Name of the Course	**Principles of Engineering Economics and Management**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION - A

ECONOMICS :Definitions, Nature & scope of Economics, Economics Systems-meaning of Capitalism, Socialism & mixed economy.

DEMAND AND SUPPLIES ANALYSIS: Law of demand and supply, exception to the law of demand, Elasticity of demand and supply and their types, Methods of measuring elasticity of demand and supply.

SECTION - B

THEORY OF PRODUCTION : Scales of production, Law of returns, Break even analysis.

MONETARY SYSTEM: Monetary Policy – Meaning, objectives, methods, Fiscal policy – Meaning & objectives of fiscal policy in a developing country like India, Functions of Reserve Bank of India and commercial banks.

ECONOMICS & BUSINESS ENVIRONMENT: Privatization –Growth of private capitalism in India, Business/Trade Cycles – Meaning, Characteristics & classification, Foreign capital & economic development.

SECTION - C

MANAGEMENT PRINCIPLES: Meaning & types of Management, Concept of Scientific Management, Management By Objectives, System Approach to Management.

FINANCIAL MANAGEMENT: Meaning, functional areas of financial management, Sources of Finance, Meaning of financial accounting, accounting principles-concepts & conventions, Importance of final accounts – profit & loss a/c and balance sheet, Need and importance of capital budgeting.

MARKETING MANAGEMENT: Introduction to marketing management, Market segmentation, Developing & managing advertising programs, Deciding on media & measuring effectiveness.

SECTION - D

PRODUCTION MANAGEMENT: Procedure for production planning & Control, Plant Location & Lay-out, Routing, Scheduling, CPM & PERT

QUALITY MANAGEMENT: Statistical Quality Control, introduction Control Charts, X Charts, R Charts, Control Charts for C (N. of defects per unit), Control chart for P(Fraction defective), Advantages & Limitations of SQC

Quality Circles:- Structure, functions & Limitations.

Text Books :-

1. Business Organisation & Management – B.P.Singh – T.N.Chabra – Dhanpat Rai & Sons.
2. Modern Economic Theory – K .K. Dewett – S.Chand & Co.

Reference Books :-

1. Marketing Management – Philip Kotler – Prentice Hall of India Pvt. Ltd.
2. Financial Management - I.M. Pandey - Vikas Publishing House Pvt. Ltd.
3. Indian Economic – Ruddar Dutt, K.P.M.Sundaram – S.Chand & Co.
4. Advanced Economic Theory – H.L.Ahuja – S.Chand & Co.
5. Production Operation Management.- Dr. B.S. Goel – Pragati Prakashan.
6. Statistical Quality Control – Grant, Leaven worth – Tata Mc. Graw Hill.
7. Personnel Management – Edwin B.Flippo – Tata Mc. Graw Hill.
8. Management – A Global Perespective – Harold Krontz – Tata Mc. Graw Hill.

SEMESTER – III

Digital Electronics (EC(ID) – 3001)

Course Code	**EC(ID) – 3001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Digital Electronics**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one section from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Binary, octal & Hexadecimal number systems and their inter conversion. Binary arithmetic (Addition , Subtraction, Multiplication & Division), 1's & 2's complements, 9's & 10's complement, BCD code, BCD Addition, Gray Code, Error Detection and Correction, Hamming code.

SECTION – B

Logic functions (OR, AND, NOT, NAND, NOR, XOR), Elements of Boolean Algebra (Theorems truth tables and relation's) Negative & Positive logic, Saturated & non saturated logic, fan in, fan-out, Logic IC's, de Morgan's Theorem, minterms and maxterms.

Karnaugh mapping, K-map representation of logical function for 2, 4 variable, simplification of Boolean equations with the help of K-map, Various minimization techniques, Quine's method and Quinnes Mc-Cluskey method, Half adder, full adder, half subtractor, full subtractor, serial and parallel binary adder.

SECTION – C

Introduction and performance criteria for logic families, various logic families - DCTL, RTL, DTL, TTL & EC working and their characteristics in brief, MOS Gates and CMOS Gates, comparison of various logic families.

SECTION – D

Various kinds of Flip-Flop: RS Flip-Flop, Clocked RS Flip-Flop, Edge triggered D Flip-Flop, Flip-Flop Switching time, JK Flip-Flop, JK Master Slave Flip flop lock wave forms.

555 timer as an astable multivibrator, shift registers: serial in serial out, parallel in parallel out, Ring counters, asynchronous counters, synchronous counters.

D/A Converter, A/D Converter, clipping and clamping circuits, astable, monostable, bistable multivibrators using transistor.

BOOKS:

1. Malvino and Leach, Digital Principles and Applications.
2. Taub and Schilling, Digital Integrated Electronics.
3. Samuel C Lee, Digital Circuits and Logic Design 4.
4. Pulse, Digital and Switching Waveforms – Millman and Taub.
5. R.P.Jain – Modern Digital Electronics.
6. Floydd – Digital Fundamentals.
7. Malvino – Digital Electronics Principles.

SEMESTER – III

Computer Organization (IT(ID)-3001)

Course Code	**IT(ID) – 3001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Computer Organization**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	**Max. Marks: 50**		

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section-A

BASICS: An introduction to computers with block diagram, Computers generation, Impact of technology.

LOGIC DESIGN TECHNIQUES : Designing combinations logic using Karnaugh-Maps with building blocks of basic gates , Multiplexers, de-multiplexer, decoders and encoders, arithmetic, logics units .Instruction codes Computers registers and instructions, timing and control, instruction cycle memory reference instruction, I –O interruption

Basic sequential logic blocks flip-flops, registers, shift registers and counters, Finite state Machine using state tables

Sections-B

COMPUTER ARITHMETIC :Adder and Subtractor circuits, Booth Multiplication algorithm Performance bench marks.

CONTROL PATH DESIGN: Sequence counter method, Micro programmed controllers address sequencing, symbolic micro –instructions

Section-C:

CENTRAL PROCESSING UNIT: Registers general register origination, stack origination, Instruction formats, address instructions, addressing modes, data transfer and manipulations, programmed control RISC instruction set design, three address instructions and arithmetic pipelines with example of floating point adder, instruction pipe lines, advanced pipe lining using instruction level parallelism

Section –D

MEMORY ORGANISATION: Memory device characteristics, random access memory, serial access memory virtual memory associative memory cache memory, memory management hardware .

I/O ORGANISATION: I/O interface asynchronous data transfer DMA interrupt, I/O processor

BOOKS:

1. **M. Moris Mano , Computer System &Architecture PHI**
2. **Hayes J. P Computer Architecture & Organization .**
3. **M. Morris & Charles R . Kire , Logic and Computer Design Fundamental –PHI 1995**

SEMESTER – III

Object Oriented Methods & Programming (IT(ID) – 3002)

Course Code	**IT(ID) – 3002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Object Oriented Methods & Programming**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION-A

Introduction to object oriented concepts : Overview, Abstract data type :Object , Modularization , classes, creating and destroying objects, garbage collection strategies , overloading , dynamic binding, polymorphism , constants.

Inheritance: class inheritance, inheriting instance variable inheriting methods, meta classes , object inheritance , multiple and multilevel inheritance

SECTION B

C++ programming language: overview: programming paradigm support for data abstraction and object oriented programming , declaration and constant , expression and statements , functions and files

Classes and objects : Definitions of class declaration , data numbers class function definition , member function definition scope resolution operator , private and public member function, nesting of member function , creating objects , accessing class data member functions , array of objects, objects as function arguments

Operator overloading :Operator function, user defined typed conversion large objects, assignment and initialization and subscripting and functions call, referencing, increment and decrement, a string class, friends and members.

SECTION –C

Inheritance thorough extending classes: Base and drive classes, visibility modes, single inheritance , protect member and inheritance , multilevel inheritance , nesting of classes .

Streams templates and design of libraries .output, input, formatting files and streams, C-I/O , Design of libraries.

SECTION –D

Objected oriented analysis and design: Object oriented analysis and system design , objected design , semantic and entity relationship modeling , contrasting design for data bases and OOA,OOD.

Books:

1. The C++ programming language , Bjarne Stroustrup ,Addison Wesley , 2000.
2. Obejcting Moudling and design, James ,Rumbaugh, Michel Blha , William Premerlani,Fredetrick Eddy and William Lorence , PHI-1998
3. Object oriented programming in turbo C++ , Robbet Lofre, Galgotia Publication Pvt Ltd. 1994.
4. Object oriented Programming with C++ , Balaguruswamy, Tata Mcgraw Hill Publication Co. Ltd 2000.
5. Programming with C++, D. Ravichandern, Tata Mcgraw Hill 1996..

SEMESTER – III

Data Structures & Algorithms (IT(ID) – 3003)

Course Code	**IT(ID) – 3003**	**Credits: 4**	**L-3, T-1, P-0**
Name of the Course	**Data Structures & Algorithms**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Basic concepts and notions, data structures and data structure operation, mathematical notation and functions algorithm complexity, linked list, representation of linked list, multi- linked structures.

SECTION – B

Trees – definitions and basic concept, linked tree representation, representations in contiguous storage, binary trees, binary tree traversal, searching insertion and deletion in binary trees, heap trees, heap sort algorithm, height balanced trees and AVL trees.

SECTION – C

Graphs an their application, sequential and linked representation of graph, adjacency matrix, operation on graph, traversing a graph , Dijkstra's algorithm for shortest distance.

Tables, searching sequential tables Hash tables and symbol tables.

SECTION - D

Searching and sorting: Use of various data structure for searching and sorting, linear and binary search, insertion sort, selection sort, Merge sort , Radix sort and bubble sort.

Note:

1.Programs are implemented in C.

2.Insertion, deletion, Search and transversal operation are to be performed on all the data structures.

Books:

1.Tenebaum , A. Lanhgsam Y and Augensatein , A. J: Data structures using C , Prentice Hall of India.

2.Seymour Lipschutg : Theory an practice of Data structure , Mc. Graw Hill 1998.

3.Horowitz E and Sahni S: Data structure with Pascal 3rd edition , Galgotia 1991.

SEMESTER – III

Numerical Analysis & Computer Programming Lab (AS (ID)- 3003)

Course Code	**AS (ID) – 3003**	Credits : 2	L-0, T-0, P-2
Name of the Course	**Numerical Analysis & Computer Programming Lab**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

Performing a practical examination assigned by the examiner (25 marks).

Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

Write down and execute following programs using C/C++ language

1. To find the roots of non-linear equation using Bisection method/Muller's method.
2. To find the roots of non-linear equation using Newton's method/Muller's method.
3. Curve fitting by least-squares approximations.
4. To solve the system of linear equations using Gauss-Elimination method.
5. To solve the system of linear equations using Gauss-Seidal iteration method.
6. To solve the system of linear equations using Gauss-Jordan method.
7. To solve integral equation numerically using Trapezoidal rule.
8. To solve integral equation numerically using Simpson's rule.
9. Find the largest Eigen value of a matrix by power – method.
10. To find numerical solution of ordinary differential equations by Euler's method.
11. To find numerical solution of ordinary differential equations by Runga-Kutta method.
12. To find numerical solution of partial differential equation/laplace equation/ wave equation/heat equation.
13. To find numerical solution of ordinary differential equations by Milne's method.
14. To solve a given problem using Newton's forward interpolation formula.
15. To solve a given problem using Lagrange's forward interpolation formula.

NOTE : Minimum 10 experiments are to be performed.

SEMESTER – III

DIGITAL ELECTRONICS LAB (EC (ID) – 3004)

Course Code	**EC (ID) – 3004**	Credits : 2	L-0, T-0, P-2
Name of the Course	**Digital Electronics Lab**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voice examination (25 marks).

Viva-voice examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

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 a ring counter.
8.Implement mod – 10 counter and draw its output wave forms.
9.Implement 4-bit DAC using binary weighted resistance technique/R-2R ladder network technique.
10.Implement 8 – bit ADC using IC (ADC 0800/0801).
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 a pulser of 1 Hz and 10 Hz, 1k/Hz and manual.
3.Construct logic state detector.
4.Construct opto – sensor based.
5.Measurement rotational speed of motor.
6.Measurement time elapse between two events.
7.Measurement of linear velocity.
8.Measurement of acceleration.
9.Construct a memory using TTL Circuits. Read and write data onto a memory from bus.
10.Construct a security latch that can be operated by an identity card.

NOTE:-Record to be maintained both electronically and hard copy for evaluation

SEMESTER – III

Data Structure Laboratory (IT(ID)-3005)

Course Code	**IT(ID) – 3005**	Credits : 2	L-0, T-0, P-2
Name of the Course	**Data Structures Laboratory**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concept write programs for finding the element in the array using Binary Search Method.
3. Write a program to perform following operations on tables using functions only

   a) Addition b) Subtraction c) Multiplication d) Transpose
4. Using iteration & recursion concept write the program for Quick Sort Technique.
5. Write a program to implement the various operations on string such as length of string , string concatenation, reverse of a string & copy of a string to another.
6. Write a program for swapping of two numbers using ‘call by value’ and ‘call by reference’ strategies.
7. Write a program to implement Binary search tree. (Insertion & deletion in binary search tree)
8. Write a program for implementation of a file and performing operations such as insert, delete and update a record in a file.
9. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list.

10. Create a linked list and perform the following operation on it

    a) Add a node b) Delete a node c) Count no. of nodes d) Sum of nodes

11. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.

12. Write a program to simulate the various graph traversing algorithms.

13. Write a program, which simulates the various tree traversal algorithms.

14. Circular double linked list

15. Sorting

    a)Bubble sort

    b)Merge sort

    c)Insertion sort

    d)Selection sort

16.Write down a program to implement polynomial equation addition in single linked list

17.Stack implementation using

    a)Array b) Linked list

18. Queue implementation using

    a)Array b) Linked list

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

SEMESTER – III

Object Oriented Methods and Programming Lab (IT(ID)-3006)

Course Code	IT(ID)-3006	Credits-2	**L-0, T-0, P-2**
Name of the Course	Object Oriented Methods and Programming Lab		
Lectures to be delivered	**26 hours of Lab Work**		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 50	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner (25 marks).
2. Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

Laboratory Exercise:

1. Raising a number n to a power of p is the same as multiplying n by itself p times. Write a function called power( ) that takes a double value for an int value for p and returns the result as double value . Use a default argument of 2 of p, so that if this argument is omitted, the number will be squared. Write a main ( ) function that gets values from the user to test this function .

2. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example (4,5) represents point 4 unit to the right of origin along the X axis and 5 units up the y-axis . The sum of the two points can be defined as new point whose X and Y coordinates.

   Write a program that uses a structure called point to model a point . Define three points and have the user input values to two of them. Than set the third point equal to the sum of the other two. And display the value of new points. Interaction with the program might look like this.

   Enter Coordinate of P1: 3 4

   Enter Coordinate of P2: 5 7

   Coordinates of P1+P2 are : 8 11

3. Create the equivalent of four function calculator . The program should request the to user to enter a number , an operator and another number . It should carry out the specified arithmetical operation: adding, subtracting, multiplying ,or dividing the two numbers. (it should use a switch statement to select the operation) finally it should be display the result.

   When it finishes the calculation , the program should ask if the user want to do another calculation. The response can be 'Y' or 'N' . Some sample interaction with the program might look like this.

   Enter first number ,operators and second number 12+100

   Answer =112

   Do another (Y/N)?N

4. A phone no. such as (212)767-8900 , can be thought of as having three parts area code(212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of phone both no. separately . Call the structure phone . create two structure Enter your area code Exchange and number : 415 555 1212

   My number is (415)555-1212

5. Create two classes DM and DB which stores the value of distances DM stores distance in meters and centimeters and DB in feet and inches . Write a program that can read value for the classes objects and add one object of DM with another object DB.

   Use a friend function to carry out the addition operation .The object that stores the result may be a Dm object or DB object depending on the units in which result are required .

   The display should be in the format of feet and inches or meters and centimeters depending on the object on display.

6. Create a class rational which represents numerical value by two double value NUMERATOR & DENOMENATOR . Include the following public member functions:

   - Constructor with no arguments.(defaults)
   - Constructor with two arguments.
   - Void reduce( ) that reduce the rational number by eliminating the highest common factor between the numerator and denominator .
   - Overload +operator to add two rational number
   - Overload operator >> operator to be enabled input through cin
   - Overload <<operator to be enabled input through count.

Write a main ( ) to test all the functions in the class

7. Consider the following class definition class father {

```
Protected : int age;
Public:
Father (int x){age = x;}
Virtual void  iam ()
{
{cout <<"I AM THE FATHER , my age is ",<<age<<endl;}
};
```

Derive the two classes son and daughter from the above classes and for each define iam() to write our similar but appropriate message .You should also define suitable constructors for these classes

Now write a main ( ) that creates objects of three classes and then call iam( ) them .Declare pointer to father , successively assign addresses of object of the two derived classes to this pointer and in each case , call iam( ) through the pointer to demonstrate polymorphism in action.

8. Write a program that create a binary files by reading the data from the students from the terminal .The data of each student consist of roll no, name(a string of 30 or lesser no. of character) and marks.

9. A hospital wants to create a database regarding its indoor patients. The information to store include.

   a) Name of the patient
   b) Date of admission
   c) Disease
   d) Date of discharge

Create a structure to store the data (year, month, date as its members). Create a base class to store the above information. The member function should include function to enter information and display a list of all the patients in database Create a drive class to store the age of patients. List the information about all to store the age of the patients. List the information about all the pediatric (less then twelve years in age)

10. Makes a class Employee with the name and salary . Makes a class manager inherit from the Employee Add an instance variable named :department, type : string. Supply a method to String that print the manager's name, department and salary. Make a class Executive inherit from information store in the manager super class object . Supply a test program that test these classes and methods.

11. Imagine a tollbooth with a class called Toll booth . The two data item are a type unsigned into to hold the total number of cars and type double to hold the total amount of money collected . A constructor initializes both these to 0. A member function called nopaycar( ). Increments the car total and adds 0.50 to the cash total. Another function, called nopaycar( ), increment the car total but adds nothing to the cash total. Finally , a member function called display the two totals . Include a program to test this class . This program should allow the user to push one key to count paying a car ,and another to count a non paying car . Pushing the ESC key should cause the program to print out the total cars and total cash and than exit

12. Write a function called reverse it ( ) that reverses a string(an array of char) use a for loop that swap the first and last characters, then the second and next to last character and so on .

the string should be passed to reversesit ( ), and print out the result. Use an input method that allows embedded blanks. Test the program with Napoleon's famous phrase , "Able was ere I saw Elba".

13. Create some objects of the string class, and put them in a Deque – some at the head of the Deque and some at the tail. Display the contents of the Deque using the for Each( ) function and a user written display function . Then search the Deque for a particular strings, using the first That ( ) Function and display any string that match, finally remove all the item from the date using the get left( ) Function and display each item. Not ice is the order in which the item are displayed: Using Get Left ( ), Those inserted on the left (head),of the Deque are removed in "last and first out" order while those put on the right side are removed in "first in first out" order. The opposite would be true if Get right ( ) were used

14. Assume that a blank maintain two kinds of accounts for customer. One called as saving accounts and another is current account . The saving account provides compound interest and withdrawal facility but no cheque book facility, The current account provides cheque book facility but no interest Current account holders should also maintain a minimum balance and if the balance false below this level , a service charge is imposed.

Create a class account that store customer name, account number and type of account. From this drive the classes cur_acct and sav_account to make them more specific to their requirement. Include necessary member function in order to achieve the following task

a) Accept deposit from a customer and update the balance

b) Display the balance

c) Compute and deposit interest

d) Permit withdrawal and update the balance

e) Check for the minimum balance, impose penalty ,necessary and update the balance.

f) Do not use any constructor , use member function to initialize the class members

15. Create a base class called shape .Use this class to store two double type values that could be used to compute the area of figure, Derive to specific classes called triangle and rectangle from the base shape . Add to the base class, a member function get data ( ) to initialize base class data member and another member function display area ( ), To compute and display the area of figures make display area ( ) as virtual function and redefine this function in the derived classes to suit the requirements.

Using this three classes design a program that will accept dimension of triangle or rectangle interactively and display the area

Remember the two value given as input will be treated as length of two sides in the case of rectangle and as base and height in the case of triangle and used as follows

Area of rectangle = x * y

Area of triangle =1/2 * x * y

Programming of exercise in C++ in the form of project (based on “object oriented programming in TURBO C++”) , Robert lafore , Galgotia Publication Pvt. Ltd.1994 to be done in consultation with the faculty incharge for the course

Note: Record to be maintained both electronically and hard copy of evaluation

SEMESTER-IV

SEMESTER – IV

ELECTRONIC MEASUREMENT & MEASURING INSTRUMENTS(EC(ID) – 4002)

Course Code	**EC (ID) – 4002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Electronic Measurement & Measuring Instruments**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

ELECTRONIC INSTRUMENTS

Electronic voltmeter, VIVM Transistor voltmeter, Electronic Multimeter, CRO's study of various stages in brief, measurement of voltage, current phase and frequency, special purpose oscilloscope measurement of inductance, capacitance, effective resistance at high frequency, Q meters, LCR meter.

SECTION – B

INSTRUMENTS FOR GENERATION AND ANALYSIS OF WAVEFORMS

Signal generators, function generator, wave analyzer, harmonic distortion analyzer, spectrum analyzer, spectrum analysis.

INSTRUMENT TRANSFORMER

Current and potential transformers, constructional features, ratio and phase angle error.

SECTION – C

TRANSDUCERS

Principles of operation, qualitative treatment of strain gauge, LVDT, thermocouple, piezo-electric crystal and photoelectric transducers.

DATA ACQUISITION SYSTEM: Necessity of recorders, Recording Requirements, Graphic Recorders, Strip chart Recorders, Magnetic tape Recorders, Digital Tape Recorders.

SECTION – D

DISPLAY DEVICES

Electronic Indicating Instruments, seven segment display, Fourteen segmental display Nixie tube.

TELEMETERY: Introduction, Method of data transmission, Types of Telemetery Systems and applications.

BOOKS RECOMMENDED

1. A.K.Sawhney – Electrical and Electronic Measurements and Instrumentation.
2. B.Stout – Basic Electrical Measurements.
3. D.Cooper – Electronic Instrumentation and Measurement Techniques.

SEMESTER – IV

Computer Architecture(IT(ID) – 4001)

Course Code	**IT(ID) – 4001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Computer Architecture**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/ Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Fundamental of Computer Design : Introduction, Measuring and Reporting Performance, Quantitative principles of Computer design, The Concept of Memory Hierarchy.

Instruction Set Principles and Examples: Classifying Instruction Set Architectures; Memory Addressing; Operations in the Instruction Set, Type and Size of Operands, Encoding an instruction set, The DLX Architecture.

SECTION – B

Pipelining: What is Pipelining? The Basic Pipeline for DLX, the major hurdle of pipelining-pipeline hazards, What makes pipelining hard to implement? The MIPS R4000 pipeline.

Advanced Pipelining and Instruction – Level Parallelism : Instruction – level parallelism: Concepts and Challenges, Overcoming Data Hazards with Dynamic Scheduling, Reducing Branch Penalties with Dynamic Hardware prediction, Taking advantage of more ILP with multiple issue, Compiler support for exploiting ILP.

SECTION – C

Memory Hierarchy Design : Introduction ,The concept of Cache memory, reducing cache misses, Reducing Cache miss penalty, Reducing Hit Time Main Memory, Virtual Memory, and memory protection.

Storage systems : Type of storage devices, Buses-connecting I/O Devices to CPU/Memory, I/O Performance Measures, Reliability, Availability and RAID, UNIX File system performance.

SECTION – D

Interconnection Networks: A simple network, connecting the interconnection network to the computer, interconnection network media, connecting more than two computers, practical issues for commercial interconnection networks, examples of interconnection networks.

Multiprocessors: Characteristics of Application Domains, Centralized Shared Memory Architectures, Distributed Shared-Memory Architectures, Synchronization.

Books:

1. Computer Architecture A Quantitative Approach, John L. Hennessy & David A. Patterson, 2nd Edition, Harcourt Asia Pte. Ltd., 1996.
2. Computer Architecture & Organisation, Mc Graw Hill, 3rd Edition, John Hayes, 1998.
3. Computer System Architecture PHI, 3rd edition, M.Morris Mano.
4. Computer Architecture and Parallel Processing, McGraw Hill Book Company, Hwang and Briggs.
5. Advanced Computer Architecture: Parallelism, Scalability, Programmability, Kai Hwang, McHill, Inc. 1993.

Suggested Text Books & References:

- Computer Organization & Design 2nd Ed. By David A. Peterson and John L. Hennessy.
- Computer Architecture & Organization 3rd Ed. By John P. Hays.
- Operating System Internals & Design Principal by William Stallings.
- Structured Computer Organization by A.S.Tannenbaum.
- Computer Organization & Architecture : Designing for performance by W.Stellings.
- Computer Architecture & Organization by M.Mano.

SEMESTER – IV

SYSTEM ANALYSIS & DESIGN(IT(ID) – 4004)

Course Code	**IT(ID) – 4004**	Credits : 4	L-3, T-1, P-0
Name of the Course	**System Analysis & Design**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION- A

Introduction To System (Overview): Definition of System, Common types of systems, Natural systems, Man made system, Automated systems, General systems principles

Participants to system development: Users, Management, Auditors, System analysts, System designers, Programmers, Operations, Personnel,.

System Development Life Cycle: phase 1: System Planning, phase 2: System Analysis, phase 3: Systems Design, phase 4: Systems Implementation, phase 5: Systems operation and support

PHASE 1: System Planning

Preliminary Investigation: Objectives and steps, Evaluation of system request, Evaluation of projects, Overview of Feasibility, Operational Feasibility, Economic Feasibility, Organizational Chart, Review current documentation

Feasibility and Cost Analysis Tools: Classification of Costs and Benefits, Cost Benefit Analysis (Payback analysis, ROI & Present value analysis)

Section-B

PHASE2: Systems Analysis

Determining Requirements: Role and requirement of system analysis, system requirements, Users requirements, Technical requirements, Interviews, Other fact finding techniques, Recording and facts

Analyzing Requirements: Structured System Analysis, Functional Diagram, Data Flow Diagrams, Entity relationship diagrams, Identifying attributes, Data Dictionary: Documenting the data elements, data flows, data stores, processes, external entities, records and reports

Section-C

PHASE 3: Systems Design: Introduction to output design, Types of Output and information delivery, Designing printed reports Designing screen outputs Designing other outputs, Tools and Techniques of design

Input Design: Introduction to input design, Source document design, input record designing ,screen design, automated design tools.

Database design: The common problem of database design, An ideal database structure, Physical database design, Designing process, Physical storage structure design

System Architecture: Processing methods, Processing functions, Processing support and software design

Section-D

PHASE 4: System Implementation

Application Development: Documentation review and application design, coding and testing the application.

Documentation: Program documentation, System documentation, Operations documentation and user documentation.

Phase 5: System Operation and Support

Overview: Systems support and maintenance activities

Support Activities : User training and assistance , maintenance activities , Corrective maintenance, Adaptive maintenance , Perfective maintenance.

Managing systems operation and support: Maintenance team, Configuration management, managing system performance.

Books

1. Element of System Analysis, Marvin Gore, John Stubbe. Galgotia Book Source. 1994
2. Systems Analysis and design Methods. Whitten, Bently and Barlow. Galgotia Publication,1995
3. System Analysis and Design, Elias M. Awad. Galgotia publication, 1995.
4. System analysis and Design, P.S.Grover, BPB Publication, 1994
5. System analysis and Design, Harry Edwards. McGraw Hill International Ed., 1995
6. Introduction to System analysis and Design I.T. Hawryszkiewyez, Prentice Hill of India, 1994

SEMESTER – IV

SYSTEM SOFTWARE (CS (ID) – 4001)

Course Code	**CS(ID) – 4001**	Credits-4	L-3, T-1, P-0
Name of the Course	**SYSTEM SOFTWARE**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min.Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION- A

Machine Architecture, instruction set, addressing modes of the chosen machine, arithmetic & logic operations, floating point operations.

C Programming: Reviews of syntax of C with emphasis on feature like pointers. Bit operations, Pre-processor, files.

SECTION - B

Assemblers, Cross Assemblers: Two pass assembler design. Data structure and algorithms.

Macro processor: Definitions, nested macro – definitions, macro expansion, conditional macro-expansion.

SECTION – C

Linking, Loading, and Relocation, Static and Dynamic linking, Loading and relocation. Editors, debuggers, interactive programming environments.

SECTION – D

DOS: Introduction to interrupts, structure of the interrupt vector table, interrupt types, software interrupts, Hardware interrupts, interrupts at a glance, interrupts calls from C, internal structure of DOS, Booting Dos, Com & Exe Programs, BIOS, Memory resident programs. Running Batch file.

Programming Examples of Text handling, file management, interface and device drivers, programming in C.

Suggested Text Books & References

- Donovan, J.J., "System Programming", Tata McGraw Hill.
- Dhamdhare, D.M., " Introduction to System Software", Tata McGraw Hill.
- Dhamdhare, D.M., " System Programming & Operating System", Tata McGraw Hill.

SEMESTER – IV

Discrete Structures (CS – 4002)

Course Code	**CS – 4002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Discrete Structures**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Set theory: Introduction to set theory, set operation, Algebra of set, Duality, finite and infinite sets Classes of sets, Power Sets Multi Sets Cartesian product, Representation of relation, Types of relation , Equivalence relation and partition, partial ordering relations and lattices.

Functions and its types, Composition of function and relations, cardinality and inverse relations

SECTION – B

Prepositional calculus: Basic operations: AND (^), OR (v), NOT (~), truth-value of a compound statement, propositions, tautologies, contradictions.

Techniques of Counting: permutations with and without repetition, Combination.

SECTION – C

Recursion And Recurrence Relation: polynomials and their evaluation, sequences, Introduction of AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, particular solutions, total solutions of a recurrence relation using generating functions.

Algebraic structures: Definition and examples of a monoid, Semi group and Undirected graphs, Homographic and isomorphic graphs, Sub graphs, Cut points and normal subgroups, cyclic groups, integral domain and fields, Cossets Lagrange‘s theorems

SECTION – D

Graphs and Trees: Introduction to graphs, Directed undirected graphs, Homomorphism and isomorphic graphs, Cut points and bridges, Multigraphs and Weighted graph, Paths and circuit , Shortest path in weighted graph, Eurelian path and circuit. Hamilton path and circuit, Planar graphs, Euler ‘s formula, Trees, Spanning trees, Binary tees and its traversals.

Suggested Text Books & References:

1. Elements of discrete mathematics C.L. Liu, McGraw HillConcrete mathematics: A foundation for computer science, Ronald Graham,
2. Donald Knuth and oren patashic, 1989, Addison- Wesley.
3. Mathematical Structure for Computer Science, Judith L. Gersting, 193. Computer Science Press.
4. Applied Discrete Structures for computer Science, Doerr and Levasseur.

SEMESTER – IV

Theory of Automata & Computation (CS – 4003)

Course Code	**CS – 4003**	Credits : 4	L-3, T-1, P-0	
Name of the Course	**Theory of Automata & Computation**			
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**			
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min.Pass Marks: 40**	
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**		

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION- A

Finite Automata and Regular Expression : Finite State System , Basic Definitions Non-Deterministic finite Automata (NDFA), Deterministic finite Automata(DFA),Equivalence of DFA and NDFA Finite Automata with E-moves, Regular expression, Equivalence of finite Automata and expression, Regular expression conversion and vice –versa.

SECTION - B

Introduction to Machines: Concept of basic machines, Properties and limitation of FSM, Moore and Mealy Machines, Equivalence of Moore and Mealy Machines, Conversion of NFA to DFA by Arden's method.

Properties of Regular Sets: The Pumping Lemma for Regular sets, Application of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of Finite Automata, Minimization Algorithm.

SECTION – C

Grammars: Definition, Context Free and context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols and unit production, Chomsky Normal Form(CNF), Griebach Normal Form(GNF).

Pushdown Automata: Introduction to push-down machines, Application of pushdown machines.

SECTION – D

Turing Machines: Deterministic and Non-Deterministic Turing Machines, Design of T.M, Halting problem of T.M., PCP problem.

Chomsky Hierarchy : Chomsky hierarchies of grammars, Unrestricted grammar, Context sensitive Language, Relation between language of classes.

Computability: Basic Concepts, Primitive Recursive Functions.

Suggested Text Books & References:

- Introduction to Automata Theory, languages & computations – Hopcroaft & O.D.Ullman, R.Motwani.
- Theory of Computer Sc. (Automata, Language & Computation): K.L.P.Mishra & N.Chandershekaran.
- Introduction to formal language & Automata – Peter Linz.

SEMESTER – IV

Electronics Measurement & Measuring Instrument Lab (EC(ID)-4007)

Course Code	**EC(ID)-4007**	Credits : 2	**L-0, T-0, P-2**
Name of the Course	**Electronics Measurement & Measuring Instrument Lab**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

1. Measurement of displacement using LVDT.
2. Measurement of distance using LDR.
3. Measurement of temperature using R.T.D.
4. Measurement of temperature using Thermocouple.
5. Measurement of pressure using Strain Guage.
6. Measurement of pressure using Piezo – Electric Pick up.
7. Measurement of distance using Capacitive Pick up.
8. Measurement of distance using inductive.
9. Measurement of speed of DC Motor using Magnetic Pick up.
10. Measurement of speed of DC Motor using Photo Electric Pick up.

SEMESTER – IV

SAD Project (IT(ID) – 4007)

Course Code	**IT(ID) – 4007**	Credits-2	**L-0, T-0, P-2**
Name of the Course	**SAD Project**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner (25 marks).
ii. Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

Aim of this Project

Aim of this Project is to equip students in the methodology of System Analysis and Design of a Live Project in the institute in which he is studying or in a place of work such as Bank, School, College and office in the vicinity of the institute.
This will be a guide Project under the Close supervision of the faculty of the institute.
Project should be presented in the form of a project report giving a candidate system for solving a life problem.

SEMESTER – IV

MAT LAB (CS – 4004)

Course Code	**CS – 4004**	Credits-2	**L-0, T-0, P-2**
Name of the Course	**MAT LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments:

i. Roots of Quadratic Equation.

ii. Guessing a number.

iii. Units Conversion.

iv. Factorial Program.

v. Simulation of an RC circuit.

vi. I-V Characteristics of a MOSFET.

vii. Finding average with a dynamic array.

viii. Writing a binary File.

ix. Reading a binary File.

x. Plotting one and two-dimensional graphs using various MATLAB 2-D Plot types.

xi. Using functions in MATLAB environment.

The Teacher concerned will give at least 10 more exercise to solve non-trivial problems using MATLAB environment.

BOOKS:

1.Programming in MATLAB,Marc E. Herniter, Thomson ASIA Ptc Ltd. Singapore(2001).

2.MATLAB,The Language of Computing; The Math work Inc.

SEMESTER - V

SEMESTER – V

MICROPROCESSOR THEORY & APPLICATIONS (EC(ID) - 5001)

Course Code	**EC(ID) – 5001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**MICROPROCESSOR THEORY & APPLICATIONS**		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min.Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	**Max. Marks: 50**		

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Introduction:

- Evolution of microprocessor, General Architecture, resistors, ALU, System buses.
- Instruction cycle, fetch cycle, execute cycle, machine cycle, T states.
- Architecture of 8085, block diagram, pin diagram, instruction formats.
- Addressing Modes:- Direct addressing, indirect addressing, indexed, register direct, register indirect, implicit addressing mode, Timing diagrams.

SECTION – B

Instruction Set & Programming:

- Typical instruction set of 8085, data manipulation, data transfer, status management instructions.
- Development of Assembly language program.

SECTION – C

Interrupts & data transfer:-

- Interrupts: Hardware & Software Interrupts, polled and vectored interrupts, level and edge triggered interrupts, enabling, disabling and masking of interrupts.
- Data transfer schemes: DMA, memory mapped, I/o, mapped, schemes of I/o interfacing.
- Interfacing of RAM, ROM Chips with a microprocessor, bus condensation, concept of wait states.

SECTION – D

Peripheral devices & applications of microprocessor:

- Description of 8251, 8255, 8253, 8257, 8259, 8279.
- A temp. monitoring system, water level control, traffic control, Generation of square waves using I/o port and SOD lines.

Books Suggested:-

1. Microprocessor & Architecture, programming and application by Gaonkar.
2. Fundamentals of microprocessor & microcomputers – B.Ram.
3. An introduction to microprocessor – A.P.Mathur.

SEMESTER – V

SOFTWARE ENGINEERING (IT (ID)- 5001)

Course Code	**IT (ID)– 5001**	Credits: 4	L-3, T-1, P-0
Name of the Course	**SOFTWARE ENGINEERING**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A

Introduction- Need for software engineering, issue in the design of large software, software life cycle models, overview of software development process.

Software Requirement Analysis and Specification- Requirements Engineering, Crucial process step, State of the practice, problem analysis, Data dictionaries, Entity relationship diagram, code object diagram, approaches to problem analysis, Structured requirements definition, structured analysis & design techniques, Software prototyping, Software requirements specification, Nature of SRS, characteristics of good SRS. Organization of the SRS, Specifying behavioral requirements, finite state machines, decision tables & tree, PDL

Section B

Software Matrics: What and why: Definition, areas of applications, problems during implementation, size matrics, The basic information Flow Model, the more sophisticated information Flow Model, Metrics analysis using statistics for Assessment, Flow problems with metric data, The common of pool of data. A pattern for successful applications.

Software Project Planning: Cost estimation: Models , Static ,single variable model, Static multivariable model, The constructive cost model: Basic model, International model, Detailed COCOMO Model, The Putnam resource allocation model: The trade off- -of-time versus cost, development sub cycle, software risk management : what is Risk, typical software risks , Risk management Activities, Risk identification, Risk projection, Risk management activity.

Section C

Software testing techniques: Software testing fundamental testing objectives, testing principles, testability, test case design, White box testing, flow graph notation, cyclomatic complexity, driving test cases, graph matrices, black box testing, graph base testing methods, equalization partitioning, comparison testing, orthogonal Array testing, Testing for real time system.

Software Testing Strategies: Strategic approach to software testing, verification and validation, unit testing, unit test procedures, integration testing, top down integration, bottom up integration, regression testing, smoke testing, validation testing, alpha testing and beta testing, system testing, recovery testing, security testing, stress testing, performance testing.

Section D

Software maintenance: What is software maintenance; categories of maintenance, problem during maintenance, potential solution to maintenance problems, the maintenance process: program understanding, generating particular maintenance proposal, ripple effect, modified program testing, maintenance models: Quick fix model, iterative enhancement model, reuse oriented model, Boehm's model estimation of maintenance cost, Beladay and Lehman model, Boehm model, Configuration management activities, software version, Change control process.

Software quality Assurance: Quality concepts, Quality, Quality control, Quality assurance, cost of quality, SQA Activities, Cost impact of defects, defect amplication and removal, Review meeting, reporting and record keeping, statistical software quality assurance, software reliability, measure of reliability and availability.

Books:

1. Software Engineering- A practitioner's Approach, RogerS. Pressmen
2. Software Engineering-K.K. Aggarwal&Yogesh

SEMESTER – V

DATABASE MANAGEMENT SYSTEM (IT(ID)- 5002)

Course Code	**IT(ID)– 5002**	Credits: 4	L-3, T-1, P-0
Name of the Course	**DATABASE MANAGEMENT SYSTEM**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A :

Overview of DBMS, Components of DBMS: (users, language, structure, data-dictionary, data manager, DBA, etc.). File processing versus Data Management, File Oriented approach versus Database Oriented approach. SPARC 3-level architecture. A brief overview of three traditional models (hierarchical mode, network model and relational model).

Section B:

Properties of relational model { Codd's 12 rules (integrity rules (concept of keys))}Relational algebra (select, project, cross product, joins (theta-join, equi-join, natural-join, outer join)), tuple relational calculus. Domain relational calculus, Entity-Relationalship model as a tool for conceptual design entities attributes and relationships, ER-Diagram, Converting ER-Model into relational schema.

Section C:

Functional Dependencies, Multi-valued Dependencies, Normalization (up to 5^{th} level), Structured Query language (with special reference of SQL of Oracle): (INSERT, DELETE, UPDATE, VIEW definitions and use of Temporary tables, Nested queries, Correlated nested queries,integrity constraints : (not null, unique check, primary key, foreign key references), file organization (Sequential file, index sequential files ,.Direct files, Hashing, B-trees, index files).

Section D:

Query processing (Introduction, steps in Query processing, General Processing Strategies, Query Optimisation). Recovery and security, Introduction to Object-Oriented Database, C/S Database, Knowledge Based Database and Distributed Database Management System.

Books :

1. C.J. Date, " An introduction to data base System", 7^{th} ed. Addison Wesly, 2000.
2. Abraham Silberschataz, Henry F. Korth S. Sudershan ,The McGraw Hill Companies, Inc., 1997.
3. Naveen prakash ,"Introduction to Database management systems",Tata McGraw hill .
4. Bipin C desai ,An introduction to database management system.

SEMESTER – V
VISUAL PROGRAMMING (IT(ID)- 5004)

Course Code	**IT(ID)– 5004**	Credits: 4	L-3, T-1, P-0
Name of the Course	**VISUAL PROGRAMMING**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section – A

VB environment, Properties, Methods, use of object browser, Basic Programming convention in VB, Menu and tool bars and programming fundamentals, flow control statements, dialog control, MS Common Control, MDI, Control Array.

Section -B

VB Design elements, concept of classes in VB procedures and function in VB, file handling, Shell Programming, OLE, ActiveX in VB, win 32 API in VB and API viewer.

Section-C

SQL query processing and Data base basics, Data Control and Data bound control, DAO and ADO, creating reports in VB, Data aware classes, ActiveX environment, packaging and development in VB.

Section – D

Advance VB (Developing Add in VB) CDO and MAPI Programming, Advance ADO Techniques, VB Script, and ASP in VB, VB and Internet Programming.

Books:

1. Brian Siler and Jeff spots: Using Visual basic 6 by PHI.
2. Professional Visual basic 6 Database Programming by WDOX publishers.
3. O'Reilly: Developing Visual Basic Add – ins by Romen pub.
4. Win 32 API Programming with Visual basic by Romen pub. O' Reilly.
5. Visual basic Shell Programming by Hamilton pub. O' Reilly.
6. Visual basic Oracle 8 Programmer's reference by Tretsch pub. O' Reilly.

SEMESTER – V

PRINCIPLES OF OPERATING SYSTEM (CS – 5001)

Course Code	**CS – 5001**	Credits: 4	L-3, T-1, P-0
Name of the Course	**Principles of Operating System**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section – A

What is an Operating system? Simple Batch Systems; Multiprogrammed Batched Systems; Time-Sharing Systems; Personal-Computer Systems; Parallel Systems; Distributed Systems; Real-Time Systems.

System Components; System Calls, System Programs; System Structure; Virtual machines.

Process Concept; Process Scheduling; Operation on processes, Cooperating Processes, Threads, Interprocess Communication

CPU Scheduling fundamental Concepts, Scheduling Criteria; Scheduling Algorithms; Multi-processor Scheduling; Real-Time Scheduling.

Threads: Overview, Multithreading Models, Threading Issues.

Section – B

Deadlocks: System Model; Deadlock Characterization; Methods of Handling Deadlocks; Deadlock Prevention; Deadlock Avoidance; Deadlock Detection; Recovery from deadlock; Combined Approach to Deadlock Handling.

Protection: Goals of protection; Domain of protection; Access Matrix and its implementation; Revocation of Access Rights; Capability-Based Systems; Language-Based protection.

Security: The Security problem; Authentication; One-Time passwords; program Threats; System Threats; Threat Monitoring; Encryption and decryption; Computer-Security Classifications.

Section – C

Memory Management: Logical versus Physical Address Space; Swapping; Contiguous Allocation; paging; Segmentation; Segmentation with Paging.

Virtual Memory: Demand paging; Performance of Demand Paging; page Replacement; Page Replacement Algorithms; Allocation of Frames; Thrashing; Demand Segmentation.

Cache memory and implementation.

Secondary-Storage Structure: Disk Structure; Disk Scheduling; Disk Management; Swap-Space management; Disk Reliability; Stable-Storage Implementation.

Section – D

Process Synchronization: critical section problem, synchronization hardware, semaphore, classic problems of synchronizations, critical regions, atomic transactions.

File-System Interface: File Concept; Access Methods; Directory Structure; Protection; Consistency Semantics.

File-System Implementation: File-System Structure; Allocation Methods; Free-Space Management; Directory Implementation ; Efficiency and Performance; Recovery.

BOOKS:

1. Abrahanm Silberschatz, Peter Baer Galvin, “Operating system Concepts”, John Wiley & Sons, Inc., Vth Eduction, 2000.
2. Deital H.M., “An Introduction to Operating systems”, Addison Wesley Publishing Co., 1984.
3. Achyut G Godbole “ Operating Systems “.
4. William Stallings “Operating Systems “.
5. A.S. Tanenbaum “ Operating System Design & Implementation ” .
6. Collin Ritcie “Operating Systems incorporating UNIX and Windows “.

SEMESTER – V
MICROPROCESSOR LAB (EC(ID) – 5006)

Course Code	**EC(ID) - 5006**	Credits : 3	L-0, T-0, P-3
Name of the Course	**MICROPROCESSOR LAB**		
Lectures to be delivered	**39 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments :

1. Study of 8085 Microprocessor Trainer kit.
2. Write a program using 8085 for
   (a) 8 bit two numbers addition.
   (b) 16 bit two numbers addition
3. Write a program using 8085 for
   (a) Two 8 bit numbers subtraction
   (b) Two 16 bit numbers subtraction
4. Write a program for multiplication of two 8 bit numbers using 8085.
5. Write a program for division of two 8 bit numbers division using 8085
6. Write a program for sorting a list of numbers in ascending & descending order.
7. Code conversion-Binding to Gray & Gray to binary .
8. Write a program for finding square of a number using look up table & verify
9. Write a program for temp control using 8085 & 8255 PPI
10. Write a program for water level control using 8085 & 8255 PPI
11. Generate different waveforms using DAC after interfacing it with a microprocessor kit-use 8255 PPI port.

SEMESTER – V

VISUAL PROGRAMMING LABORATORY (IT (ID) – 5006)

Course Code	**IT(ID) – 5006**	Credits: 2	L-0, T-0, P-2
Name of the Course	**VISUAL PROGRAMMING LABORATORY**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Practical:

(i) Basic VB programming

(ii) ActiveX

(iii) Screen Saver

(iv) Report Writing

(v) ADO programming and Databases.

(vi) VB Script and ASP LAYERS

(vii) Business Objects

(viii) Classes in VB

Projects

1. Inventory Control using VB
2. Data conversion utility in VB
3. Editor and text handling Projects.
4. Creation of Dynamic site using ASP and VB script
5. Encryption control using ActiveX
6. Library transaction wizard.

SEMESTER – V
RDBMS LABORATORY (IT(ID) – 5007)

Course Code	**IT (ID)– 5007**	Credits: 2	L-0, T-0, P-2
Name of the Course	**RDBMS LABORATORY**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates
Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.
List of experiments:

1. Familiarization with RDBMS(ORACLE/FOXPRO) using VISUAL BASIC as front end) & developing a small application.
2. Create a database and write the programs to carry out the following operation:
   (i) Add a record in the database.
   (ii) Delete a record in the database.
   (iii) Modify the record in the database.
   (iv) Generate queries.
   (v) Generate the report.
   (vi) List all records of database in ascending order.
3. Develop a menu driven project management of database system:
   (i) Library information system
   (a) Engineering
   (b) MCA
   (ii) Inventory control system
   (c) Computer Lab
   (d) College Store
   (iii) Student Information System
   (e) Academic
   (f) Finance
   (iv) Time Table development system
   (g) CSE, IT & MCA Departments.
   (h) Electrical & Mechanical Departments.

Usage of S/W:

1. VB, ORACLE and/or DB2
2. VB,MS Acess.
3. VB, MS SQL SERVER 2002

Note: At least 5 or 10 more exercises to be given by the teacher concerned.

SEMESTER – V
PC LAB (HARDWARE) (CS – 5002)

Course Code	**CS – 5002**	Credits: 2	L-0, T-0, P-2
Name of the Course	**PC LAB HARDWARE**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates
Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).
ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS:

1. To check and measure various supply voltages of PC.
2. To make comparative study of motherboards.
3. To observe and study various cables, connections and parts used in computer communication.
4. To study various cards used in a system viz. display card, LAN card etc.
5. To remove, study and replace floppy disk drive.
6. To remove, study and replace hard disk.
7. To remove, study and replace CDROM drive.
8. To study monitor, its circuitry and some elementary fault detection.
9. To study printer assembly and elementary fault detection of DMP and laser printers.
10. To observe various cables and connectors used in networking.
11. To study parts of keyboard and mouse.
12. To assemble a PC.
13. Troubleshooting exercises related to various components of computer like monitor, drives, memory and printers etc.
14. Partitioning of Hard Disk .
15. Hard Disk Formatting and its maintenance.
16. To study SMPS.

Reference Books:

Complete PC upgrade & maintenance guide, Mark Mines, BPR publ.
PC Hardware: The complete reference, Craig Zacker & John Rouske, TMH
Upgrading and Repairing PCs, Scott Mueller,1999,PHI,

SEMESTER – V
INDUSTRIAL TRAINING (CS-5003)

Course Code	**CS – 5003**	Credits: 0	L-0, T-0, P-0
Name of the Course	**INDUSTRIAL TRAINING**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 40**
Continuous Assessment	**Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates:
This training will be related to industrial projects/ software projects to be undertaken under the guidance of faculty preferably at industry/ software park/ incubation center or related areas. This may also be undertaken with in the institute. This training will be undertaken during vacation. Student is supposed to submit the project report at the end of the training.

Evaluation will be based on project report, presentation and comprehensive viva-voce examination related to the project.

SEMESTER - VI

SEMESTER – VI
ADVANCE MICROPROCESSOR & MICROCONTROLLERS (EC (ID) - 6003)

Course Code	**EC (ID) – 6003**	Credits: 4	L-3, T-1, P-0
Name of the Course	**Advanced Microprocessor & Micro Controllers**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	**Max. Marks: 50**		

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Introduction:

Introduction to microprocessors, microcomputer, batch processing, multiprocessing, multiprogramming, Time Share & multitasking systems. Introduction to 8086, 80186, 80286, 80386, 80486.

SECTION – B

Architecture & Programming of 8086:

Architecture – BIU, the queue, segment registers, instruction pointer, EU, Flag registers, addressing modes of 8086, instruction set of 8086, instruction format, min./max. mode.

Writing the programs, program format, segment and end directives, Data & addresses, Naming directives – EQU, DB, DW & DD, Flags, Jump, loop and string instructions.

SECTION – C

Programming in 8086 microprocessor unit, addition, subtraction, sorting, searching, multibyte addition, fibonacci, factorial, code conversion etc.

SECTION – D

32 bit microprocessors: 80186, 80286, 80386, 80486 systems and their comparison, interfacing of static and dynamic memories and I/o with 8086.

Interfacing of microprocessor to keyboard, alphanumeric display and stepper motor.

Suggested Books:-

1. Microprocessor & interfacing program & Hardware Tata McGraw Hills by D.V.Hall.
2. 8088/8086 microprocessor programming, interfacing, Hardware & application: Tribel & single PHI.
3. Advanced Microprocessor & interfacing: B.Ram TMH.
4. 8086 microprocessors by B.S.Chhabra.

SEMESTER – VI

MULTIMEDIA TECHNOLOGY (IT (ID) – 6004)

Course Code	**IT (ID) – 6004**	Credits: 4	L-3, T-1, P-0
Name of the Course	**MULTIMEDIA TECHNOLOGY**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Introduction: Motivation Overview, Evolution of Multimedia, Structure and components of Multimedia. Application Domains, Internet and Multimedia, Multimedia and Interactivity, Primary User-Interface Hardware: Mouse. Keyboard, Joystick. Primary Visual Interface Items: Window, Buttons, Textbox, Icons. Basic Metaphors: Side – Show, Book, Hypertext. Hypertext, Hypermedia, Browsers and helper Application overview User Interface Design Issues.

Technology: Sound and Audio, Psycho acoustics – Frequency and amplitude sensitivity of hearing music and noise, stereo effects. Masking, Frequency domain compression of analog sound signal digitization of audio signal - sampling and coding, digital audio signal processing, architecture of a sound card, elementary concept of music, pitch and voice, staff notation and scoring, electronic music and synthesizer, MIDI interface, protocol and data format.

SECTION - B

Image & Graphics: Principles of raster graphics, Computer Visual Display concepts, Resolution, colour and pallets, Refresh rates an graphic accelerators, Digital image Representation and formats, Graphic drafting Tools, Image processing and enhancement, Colour printer principles, Image scanner principle, File formats, Digital still Camera and photography.

Animation and special effects: animation principles, Survey of animation tools, Special Visual Effects wiping, morphing etc.

Video Technology: Analog Video, Principles Broadcast standards, CCD Camera, Recording formats and standard, Digital Video, Principles, PC video and Videoconference standards, TV Cards Frame Grabber Principles, IDTV and HDTV principles, Motion Picture to Video Conversion.

SECTION – C

Data Compression: Data Compression Requirement, Information Theory based and frequency domain based and compression Basic Compression Techniques: DPCM, Runlength Coding, Huffman Coding, JPEG ISO, Realtime encoding and CCITT H.261 (px64) standard, MPEG-land II, DVI.

Multimedia Document and Interchange formats: Hypertext, HTML, MHEG and Hypermedia, SGML, Open document Architecture (ODA), Quick Time Movie film format, Open Media framework (OMFI)

SECTION – D

Synchronization: Temporal Dependence in Multimedia presentation. Inter-object and Intra-object Synchronisation, Time Abstruction for authoring and visualization, Reference Modle and Specification.

Application Development: Product development overview, Life cycle Models, Human Roles and Teamwork, Product Planning, Basic Authoring Paradigms: Story Scripts, Authoring Metaphors and authoring languages, Content Analysis: Message, platform, Metaphor and Navigation, cost-quality tradeoffs, Intellectual Property Right and Copyright issues.

Books:

1. Multimedia Systems Design, P.K.Andleigh and K.Thakrar, Prentice hall PTR, 1996.
2. Multimedia Computing, Communications and Applications, Ralf Steinmetz and Klara Nashtedt, Prentice Hall 1995.
3. Creating Multimedia Presentations, Douglas E.Wolfgram, Que. Crop., 1994.
4. Multimedia Authoring: Building and Developing Documents, Scott Fisher, AP Professional, 1994.
5. Multimedia systems, Ed. By John F.K.Buford, Addison – Wesley Publishing Co., 1994.
6. Multimedia Technology & Applications, David Hillman, Galgotia Publications.
7. Multimedia Systems, Rajneesh Agrawal, Excel Books.
8. Digital Multimedia, Nigel Chapman & Jenny Chapman, Wiley Publications.
9. Fundamentals of Computer Graphics and Multimedia, D.P.Mukherjee.

SEMESTER – VI

DIGITAL & ANALOG COMMUNICATION (CS – 6001)

Course Code	**CS – 6001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**DIGITAL ANALOG & COMMUNICATION**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Fourier series and Fourier transform representation, convolution, laws of convolution, parsevals theorem (energy & power theorem).

SECTION B

NOISE: Sources of Noise, Frequency-Domain representation of noise, Spectral components of noise, response of narrow band filter to noise. Noise band width, Noise temperature, Noise figure.

SECTION C

Modulation & Deputy Registrar – Demodulation:

Introduction to AM, Frequency spectrum of AM waves, representation of AM, power relation in AM waves, need and description of SSB. Independent side band system of VSB. Generation and Detection of AM.

Introduction to FM, Mathematical Representation of FM, Frequency spectrum of FM wave, generation and detection of FM.

Basic principles of AM & FM receivers and transmitters.

SECTION D

DIGITAL COMMUNICATION:

Sampling theorem: Introduction to PAM, PWM, PPM, PCM, DPCM and Delta Modulation. Simple circuits for their generation.

Books Recommended:

1. Singh & Sapre “Communication Systems: Analog and Digital”, TMH.
2. Kennedy, “Electronics Communcation Systems”, TMH.
3. Taub & Schilling, “Principles of Communication Systems,” MCGraw Hill.
4. Tomasi, “Electronics Communication Systems: Fundamentals through Advanced”, Pearson Education Publisher.

SEMESTER – VI
COMPUTER GRAPHICS (CS – 6002)

Course Code	**CS-6002**	Credits: 4	L-3, T-1, P-0
Name of the Course	**Computer Graphics**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 100**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section-A

L**ine Generation:**

Points – Lines – Planes – Vectors – Pixels – Frame buffers – Vector and character generation.

Graphics Primitives:

Display devices – Primitive Operations – Display file structure – Display control text – Graphic Adapter cards and Monitors.

Polygons:

Polygon representation – Entering polygons – Filling polygons – Scan converting polygons – Aliasing and Ant aliasing half toning.

Section-B

Transformations:

Matrices – Transformations – Transformation routines – Display procedures.

Segments:

Segmentable – Creating, closing, deleting and renaming a segment – Visibility – Image transformation.

Windowing and Clipping:

View transformations – Clipping – Algorithms : Southerland – Cohen, Cohen – Sutherland, midpoint subdivision, Cyrus beak – Introduction to 3D – clipping – Generalized clipping – Multiple windowing.

Section-C

Interaction:

Hardware – Input device handling algorithms – Event handling – Echoing interactive techniques.

Three Dimensions:

3D Geometry – Primitives – Introduction to 3D transformations – Projections – Elementary ideas about curve generation – Surface generation using Bezier Spline, Biezer, Hermitte.

Section-D

Hidden Line and Surface:

Back face removal – Algorithms – Hidden line methods – Floating horizon algorithms – Roberts algorithm – War knock algorithm – Z – buffer algorithm – List priority algorithm.

Rendering:

A simple illumination model – Determining surface normal – Determining the reflection vector – Gourand shading – Phuong shading – Transparency shadows – Texture – Recent advances in rendering.

Books :

1. David F.Roger : PROCEDURAL ELEMENTS OF COMPUTER GRAPHICS; McGraw –Hill.
2. Rogers & Adams: MATHEMATICAL ELEMENTS OF COMPUTER GRAPHICS; McGraw- Hill.
3. Harrington S:COMPUTER GRAPHICS-A PROGRAMMING APPROACH; McGraw- Hill.

SEMESTER – VI
COMPILER DESIGN (CS-6003)

Course Code	**Cs-6003**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Complier Design**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Introduction to Compilers:
Need for translators – Structure of a compiler – Error handling – Compiler writing tools.
Lexical Analysis:
The role of lexical analyze – Design – Languages for specifying lexical analyzer implementation.

SECTION B

Parsing:
Parsers – Shift reduce parsers – Operator Precedence parsing – Top down
Parsing – Predictive parsers.
Automatic Construction of Efficient Parsers:
LR Parsers – Construction SLR, Canonical LR and LALR Parsing tables –
Automatic parser generation – Implementation of LR parsing tables.

SECTION C

Syntax Directed Translation:
Schemes – Implementation – Intermediate code – Parse trees and syntax trees – Three Address code – Quadruples and triples – Translation of assignment statements – Boolean expressions.
Symbol tables and runtime storage:
Contents of Symbol table – Data structures for symbol table – Representation of scope information – Implementation of stack allocation schemes – Block Structured languages and storage allocation.

SECTION D

Introduction to Code Optimization:
Principal sources – Loop optimization – Global data flow analysis.
Code Generation:
Object program – Problems in code generation – A simple code generator - Register allocation and assignment.

Text Books:

Alfred V.Aho & Jeffrey D. Ullman : PRINCIPLES OF COMPILER DESIGN; Narosa Publishing House, 1990

References:

1. Alfred V. Aho et.al. : COMPILERS:PRINCIPLES, TECHNIQUES AND TOOLS; Addison Wesley Publishing Company, 1986
2. Dhamdhere D.M.: COMPILER CONSTRUCTION-PRINCIPLES AND PRACTICE; McMillan India Ltd.
3. Ravi Sethi & Ullman: COMPILER DESIGN; Narosa Publishing House.
4. David Gries :COMPILER CONSTRUCTION FOR DIGITALCOMPUTERS; John Wiley &Sons

SEMESTER – VI

RELATIONAL DATA BASE MANAGEMENT SYSTEM (CS- 6004)

Course Code	**CS – 6004**	Credits: 4	L-3, T-1, P-0
Name of the Course	**Relational Data Base Management System**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section-A

Query Processing and Optimization:

Basic Algorithms for executing Query Operations, Using Heuristics in Optimization

Transaction Processing Concepts:

Introduction to Transaction Processing, Transaction and System concepts Desirable Properties of transaction, Schedules and recoverability, Serializability of schedules.

Section-B

Concurrency Control Techniques:

Locking Techniques for concurrency control Techniques Based on Time Stamp Ordering, Multiversion concurrency control Techniques, Validation(optimistic) Concurrency Control Techniques

Recovery techniques:

Recovery Concepts, Recovery Techniques Based on Deferred Update, Recovery Techniques Based on Immediate Update, Shadow Paging, Recovery in Multi database Transaction.

Database Security and Authorization:

Introduction to Database Security Issues, Discretionary Access Control Based on Privileges, Mandatory Access Control for Multilevel Security, Statistical Database Security.

Section-C

Advanced Data Modeling Concepts

Enhanced – ER (ERR)-to-Relational Mapping, Data Abstraction and Knowledge Representation Concepts, Integrity Constraints in data modeling,

EER Update Operations and Transaction Specification, Overview of other Data models.

Object-Oriented Databases

Overview of Object-Oriented concepts, Object Identity, Object Structure and Type Constructor. Encapsulations of Operations, Methods and Persistence, Type and Class Hierarchies and Inheritance, Complex Objects, Other O – O concepts.

Section-D

Distributed Databases and Client-Server Architecture

Introduction to Distributed DBMS Concepts, Overview of Client-Server Architecture, Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design, Types of Distributed Database Systems, Query Processing in Distributed Databases, Overview of Concurrency Control and Recovery in Distributed databases.

Deductive Databases

Introduction to Deductive Databases, Prolog/Data log Notation, Interpretation of Rules, Basic interference Mechanism for Logic Programs and their evaluation. The LDL System, Other Deductive Database Systems.

Emerging Database Technologies and applications

Progression of Database Technology, Emerging Database Applications, Next Generation of Databases and Database Management Systems, Interfaces with other Technologies.

Books:

1. **Ramez Elmasri, Shamkant B. Navathe**:"FUNDAMENTALS OF DATABASE SYSTEMS" The Benjamin/Cummings Publishing company 1994-Narosa Spetial Edition
2. **Ceri S. and Palagatti,G:**"DISTRIBUTED DATABASE : PRINCIPLES AND SYSTEM ,Mc Graw Hill, 1984.
3. **Korth, H. and Silberschatz,A**: "DATABASE SYSTEM CONCEPTS" Second Edition Mc Graw-Hill. 1991.

SEMESTER VI

ADVANCED MICROPROCESSORS LAB (EC(ID) – 6007)

Course Code	**EC(ID)-6007**	Credits: 2	L-0, T-0, P-2
Name of the Course	**Advanced Microprocessor Lab**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time: 3 hrs**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner (25 marks).

ii. Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments

1. Study of 8086 Microprocessor kit.
2. Write a program using 8086 for division.
3. Write a program for finding square root of given number.
4. Write a program using 8086 for:
   a) Finding largest number from an array
   b) Finding smallest number from an array
5. Write a program using 8086 for arranging an array of nos. in ascending & descending order.
6. Write a program to control the operation of stepper motor using 8086 & 8255 PPI
7. Write a program to convert binary code to gray code.
8. Write a program to calculate the number of bits in a string.
9. Write a program to convert data string into its 2's complement form.
10. Write a program to move a block of words from one memory location to other.

SEMESTER – VI

MULTIMEDIA TECHNOLOGY LAB (IT (ID)– 6008)

Course Code	**IT (ID) – 6008**	Credits: 2	L-0, T-0, P-2
Name of the Course	**MULTIMEDIA TECHNOLOGY LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner (25 marks).
ii. Viva-voce examination (25 marks).

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS:

1. Using available Multimedia software like Photoshop, Macromedia, Generator, Flash to create
   a) Backgrounds.
   b) Titling.
   c) Icons.
   d) Pulls.
   e) Buttons & Bullets.
   f) Menu Bars.
   g) Animation (Rotate, fade, Marquee, Twirl, Morphing etc. and submit a project in consultation with instruction tutor incharge.
2. Overview of Flash 5.
   a) Menu. b) Lasso Tool. c) Arrow Tool. d) Pen Tool.
3. Working with Drawing and Painting Tool.
4. Working with Bitmap and Raster Graphics.
5. Sound and Movie.
6. Understand of Action scripts.
7. 3-D graphics.
8. Animation.
9. Write a program to read a paragraph and store it in suggested format.
10. Study the pions notes and stimulate them using key board and store them in file.
11. Write a program to play wave, mid file.

Projects:

1. Create a HTML based static website.
2. Create a Animated movie in flash.
3. Create a full motion video movie in flash.
4. Create a post table game in flash.

SEMESTER – VI

COMPUTER GRAPHICS LAB(CS – 6005)

Course Code	**CS-6005**	Credits: 2	L-0, T-0, P-2
Name of the Course	**Computer Graphics Lab**		
Lectures to be delivered	**26 hours of Lab work (2 hours per week)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 25**
Laboratory Continuous Assessment	Lab Work 30%, Lab record 25%, Viva/Hands on 25%, Attendance 20%	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner (25 marks)
ii. Viva-voce examination (25 marks)

Viva-voce examination will be related to the practical performed/project executed by the candidate related to the paper during the course of the semester.

1. Program to draw line using Bresenham's algorithm for all quadrants.
2. Program to draw a circle.
3. Program to draw an ellipse.
4. Program to draw a spiral using Bresenham's circle drawing algorithm.
5. Procedure to move a line around the circle.
6. Procedure to rotate a wheel.
7. Procedure to translate a circle.
8. Solid area scan conversion.
9. 2 Dimensional & 3 Dimensional Transformation.
10. Program to show 2D clipping and windowing.
11. Development of 2D graphics package.

NOTE : **Record to be maintained both electronically and hard copy for evaluation**

SEMESTER – VI

Compiler Design Lab (CS – 6006)

Course Code	**CS-6006**	Credits : 2	L-0, T-0, P-2
Name of the Course	**Compiler Design Lab**		
Lectures to be delivered	**26 hours of Lab work(2 hours per week)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory Continuous Assessment	Lab Work 30%, Lab record 25%, Viva/Hands on 25%, Attendance 20%	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner (25 marks)
ii. Viva-voce examination (25 marks)

Viva-voce examination will be related to the practical performed/project executed by the candidate related to the paper during the course of the semester.

1. Design and implementation of text editor with variations.
2. Design and implementation of syntax directed line editor.
3. Design and implementation of a two pass assembler for a hypothetical computer.
4. Design and implementation of a microprocessor for a hypothetical machine.
5. To write a program in a suitable high level language to carry out lexical analysis of an input program in H.L.L. (Pascal, Fortran etc.)
6. To write a parser using C or Pascal language for any input HLL program for which lexical analysis have been carried out.
7. To write a program to generate machine code for restricted programming expressions.
8. Design and implementation of a linkage editor on an existing installation.
9. Design of a cross assembler on existing installation.
10. Design and implementation of an application package like spread sheet.
11. Experiment on code optimization of programming expressions.

NOTE : *Record to be maintained both electronically and hard copy for evaluation*

SEMESTER - VII

SEMESTER – VII

COMPUTER NETWORKS & DATA COMMUNICATION EC (ID) – 7003

Course Code	**EC (ID) – 7003**	Credits: 4	L-3, T-1, P-0
Name of the Course	**COMPUTER NETWORKS & DATA COMMUNICATION**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	**Max. Marks: 50**		

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A

Introduction

User of computer Networks LAN, MAN, WAN, Wireless Networks, Networks software; Protocol hierarchies, design issues of layers interfaces and services. The OSI reference model, the TCP/IP reference model

The Physical Layer :

Fourier analysis, maximum data rate of a channel, transmission media, wireless transmission, narrow band ISDN, Broadband ISDN and ATM; Virtual circuits versus circuits switching.

Section B

Data link layer

Data link layer design issues; services provided to network layer, framing, error control, flow control, error detection and correction. Elementary data link protocol; an unrestricted simplex protocol. A simplex stop and wait protocol, simplex protocol for noisy channel, sliding window protocol; one bit sliding window protocol, protocol using go back-N, protocol using selective repeat ,Protocol specification and verification, example data link protocols;HLDC- high level data link control.

SECTION C

The Medium Access Sublayer:

Channel allocation problem; static and dynamic channel allocation in LAN's and MAN's multiple access protocols- ALOHA carrier Multiple access protocol, WDMA protocol, wireless LAN protocol collision free protocols, limited contention protocols, IEEE standards 802.3 and Ethernet, IEEE standard 802.4 token bus, IEEE standard 802.5 token, ring. Distributed queue dual bus, logical link control bridges, high speed LANs, Satellite network.

SECTION D

Network, layer design issues, routing algorithms, congestion control algorithm, internetworking.

TRANSPORT LAYER: Transport services, elements of transport protocols, simple transport protocol, overview of application layer (TCP, UDP).

Reference Books:

1.Computer Networks by Tenanbaum (3rd edition)
2.Data & Computer Communication by Black.
3.Data Communication and Networking by FORAUZAN.

SEMESTER – VII
ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM(CS-7001)

Course Code	**CS-7001**	Credits: 4	L-3, T-1, P-0
Name of the Course	**ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM**		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		Max. Marks: 50	

Instructions

1. For Paper Setters: The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. For candidates: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section-A

Introduction to AI: Problems, Techniques and programming Languages. Introduction to LISP : List manipulations, functions, predicates, and conditionals , input , output and logical variables, iteration and recursion. Lists and arrays. Introduction to PROLOG.

Problems, Problems Spaces & Search: Defining a problem as a space, search, production systems, problem characteristics, production system characteristics, issues in the design of search programs.

Section-B

Heuristic Search Techniques:

Generate – and – test, Hill Climbing, best – first search (A*), Problem Reduction (AO*), constraint satisfaction, Means End Analysis.

Knowledge Representation Issues: Representations and Mappings, approaches to knowledge representation, issues of knowledge representation, the frame problem

Section-C

USING PREDICATE LOGIC: Representing simple facts in logic representing instance & its relationships, computable functions and predicates, resolution natural deduction.

REPRENTING KNOWLEDGE USING RULES: Procedural vs declarative knowledge, logic programming, forward and backward searching, matching, control knowledge,

Section-D

GAME PLAYING AND SEARCH: Introduction Min-Max Algorithm, alpha-beta cutt off. Examples of games.

EXPERT SYSTEM: Component of an expert system, categories of an Expert System, stages in development of Expert System, Expert System Development Tools. Expert System Architecture, Frames.

TEXT BOOKS:

1. Patterson, D.W.: INTRODUCTION TO ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM, Prentice hall of India, New Delhi
2. Rich, E & Knight, K: ARTIFICIAL INTELLIGENCE, Tata McGraw Hill Pub Co, New Delhi
3. Nilson, N.J.: PRINCIPLES OF ARTIFICIAL INTELLIGENCE, Narosa Pub, House
4. References:
5. Schmildt, H: ARTIFICIAL INTELLIGENCE, USING c, McGraw Hill
6. Winston, P.H.: ARTIFICIAL INTELLIGENCE, Addition - Wesley

SEMESTER – VII

DISTRIBUTED OPERATING SYSTEM (CS – 7002)

Course Code	**CS – 7002**	Credits : 4	L-3, T-1, P-0
Name of the Course	**DISTRIBUTED OPERATING SYSTEM**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry240% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A:

Operating System Fundamentals: Evolution of Modern Operating Systems, Overview of System sample distributed application, Centralized Operating Systems, Network Operating Systems, Distributed Operating Systems, Cooperative Autonomous Applications. Interprocess Communication and Coordination: Selection Factors, Message Passing Communication, Pipes, Sockets, Request/Reply Communication, Transaction Communication, Name and Directory Services, Distributed Mutual Exclusion.

SECTION B:

Distributed Process Scheduling: A System Performance Model, Static Process Scheduling with Communication, Dynamic Load Sharing and Balancing, Distributed process Implementation, Real-time Scheduling.

Distributed File Systems: Transparencies and Characteristics of DFS, DFS Design and Implementation, Transaction Service and Concurrency Control, Data and File Replication.

SECTION C:

Distributed Shared Memory: Non-Uniform Memory Access Architecture's, Memory Consistency Models, Multiprocessor Cache Systems, Distributed Shared Memory, Implementation of DSM systems.

Distributed Computer Security: Fundamentals of Computer Security, Discretionary Access Control Models, Mandatory Flow Control Models, Cryptography, Distributed Authentication and Key Distribution Issues Relevant to Distributed Security.

SECTION D:

Concurrency Control: Mutual Exclusion & Critical Regions, Semaphores, Locks, Token Passing/Mutual Exclusion, Deadlocks.

Transaction Management & Consistency Models: Transaction Management, ACID Properties Of A Transaction , Consistency Models, Two Phase Commit Protocol, Nested Transactions.

Text/References:

1. Distributed Systems: Principles and Paradigms :Andrew Tannenbaum and Maarten van Steen,
2. Distributed Operating Systems : Concepts and Design: Pradeep K. Sinha.
3. Distributed Operating Systems and Algorithm Analysis : Randy Chow, Theodore Johnson,
4. Distributed Operating Systems: Andrew S. Tanenbaum

L. Galli, Distributed Operating Systems,

SEMESTER – VII

ANALYSIS & DESIGN OF ALGORITHMS (CS – 7003)

Course Code	**CS – 7003**	Credits : 4	L-3, T-1, P-0
Name of the Course	**ANALYSIS & DESIGN OF ALGORITHMS**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	**Max. Marks: 50**		

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A

Introductory Concepts: The notation of algorithm, fundamentals of algorithmic problem solving, analysing algorithms, A review of fundamental data structures.

Fundamentals of analysis of algorithms efficiency: Asymptotic notation and standard efficiency classes, mathematical analysis of recursive and non-recursive algorithms.

Section B

Divide and Conquer: merge sort, quick sort, binary search, Selection sort.
Search : Binary trees, breadth first search , depth first search.
Dynamic Programming: All pair shortest path, Optimal binary search tree, knapsack problem, the travelling sales person problem;Flow shop scheduling.

Section C

Backtracking:the 8 queens problem, graph coloring, hamiltonian cycles.
Greedy Method: prim's algorithm, kruskal's algorithm, dijkstra's algorithm, Minimum cost spanning trees.
Branch and Bound: least cost search(LC), the 15 puzzle, bounding, fifo branch and bound, LC branch and bound.

Lower Bound Theory: comparison trees, oracles and adversary arguments, techniques for algebric problems, lower bounds on parallel computing.

Section D

NP hard and NP complete problems: Basic concepts, Cook's theorem, examples of NP hard problems and approximation algorithms. deterministic and non deterministic polynomial time algorithms.

Space and time tradeoff in algorithms.

Texts/References:

1. Horowitz Ellis And Sartaj Sahni: Fundamentals of Computer Algorithms.
2. Anany V. Levitin: Introduction to Design and analysis of algorithms
3. D.E. Kunth:The art of computer programming Vols 1 and 3
4. Aho-Hopcroft and Ullman: The Design and Analysis of computer algorithms.

SEMESTER – VII

NATURAL LANGUAGE PROCESSOR (CS-7004)

Course Code	**CS – 7004**	Credits: 4	L-3, T-1, P-0
Name of the Course	**NATURAL LANGUAGE PROCESSOR**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section-A:

Components of natural language processing: lexicography, syntax, semantics, pragmatics: word level representation of natural languages prosoty & natural languages.

Section-B:

Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, Ambiguous grammars, resolution of ambiguities.

Section-C:

Computation linguistics: recognition and parsing of natural language structures: ATN & RTN,General techniques of parsing: CKY, Earley & Tomitas algorithm.

Section-D:

Semantics-knowledge representation semantic networks logic and inference pragmatics, Graph models and optimization, prolog for natural language semantic.

Application of NLP: intelligent work processors: Machine translation ,user interfaces , Man- Machine interfaces, natural language querying, tutoring and authoring systems, speech Recognition commercial use of NLP.

Text Book:

1. "Natural Language Understanding" James Alien ,Benjamin-1995, ~cummings Pub. Comp. Ltd.,

Reference Rooks:

2. "Language as a cognitive process", Terry Winograd 1983,AW
3. "Natural Language processing in prolog" G.Gazder,1989,Addison Wesley.
4. "Introduction of Formal Language Theory", Mdlj Arbib & Kfaury, 1988, SpringerVerlog.

SEMESTER - VII

COMPUTER NETWORKS AND DATA COMMUNICATION LAB (EC (ID) – 7009)

Course Code	**EC(ID) – 7009**	Credits: 2	L-0, T-0, P-2
Name of the Course	**COMPUTER NETWORKS AND DATA COMMUNICATION LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time : 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks : 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

1. *Performing a practical examination assigned by the examiner (25 marks).*
2. *Viva-voce examination (25 marks).*

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS:

3. To study different types of transmission media.
4. To study 16 Quadrature Amplitude Multiplexing.
5. To study Serial Interface Centronics and its applications.
6. To configure the modern of a computer.
7. To make inter-connections in cables for data communication in LAN.
8. To install LAN using Tree topology.
9. To install LAN using STAR topology.
10. To install LAN using Bus topology.
11. To configure a HUB/Switch.

SEMESTER – VII

EXPERT SYSTEM LAB (CS-7005)

Course Code	**CS-7005**	Credits: 2	L-0, T-0, P-2
Name of the Course	**EXPERT SYSTEM LAB**		
Lectures to be delivered	**26 hours of Lab work**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 50**	**Min. Pass Marks: 20**
Laboratory Continuous Assessment	Lab Work 30%, Lab record 25%, Viva/Hands on 25%, Attendance 20%	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

I. Performing a practical examination assigned by the examiner (25 marks)
II. Viva-voce examination (25 marks)

Viva-voce examination will be related to the practical performed/project executed by the candidate related to the paper during the course of the semester.

1. Study of PROLOG/LISP.
2. Write the following programs using PROLOG/LISP.
3. Write a program to solve 8 queens problem.
4. Solve any problem using depth first search.
5. Solve any problem using best first search.
6. Solve 8-puzzle problem using best first search
7. Solve Robot (traversal) problem using means End Analysis.
8. Solve traveling salesman problem

NOTE : *Record to be maintained both electronically and hard copy for evaluation*

SEMESTER – VII

MINOR PROJECT(CS – 7006)

Course Code	**CS – 7006**	Credits: 4	L-0, T-0, P-4
Name of the Course	**MINOR PROJECT**		
Lectures to be delivered	**52 hours of Lab session(4 hrs per week)**		
Semester End Examination	**Max. Time: 3 hrs**	**Max. Marks : 50**	**Min. Pass Marks :**
Laboratory **Continuous Assessment:**	**Viva voce and software**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Project Evaluation will consists of Three parts :

1. Evaluation of the project report along with source code in a CD in the required format by an external examiner 40% marks. Continuous evaluation by the internal examiner 30% marks
2. Viva-voce examination (20%marks).
3. Software evaluation with test runs(10%).

Viva-voce examination will be related to the projects executed by the candidate during the course of the semester.

Aim of this Project :

Aim of this project is to equip student in the methodology of system analysis and design of a live project in the institution in which he is studying or in a place of work such as bank, school, college and office in the vicinity of the institute. This minor project can be a precursor to the major project to be undertaken in the eight semesters.

This will be a guided project under the close supervision of the faculty of the institute. Projects should be presented in the form of a project report giving a candidate system for solving a live problem.

SEMESTER – VII

INDUSTRIAL TRAINING (CS-7007)

Course Code	**CS – 7007**	Credits: 0	L-0, T-0, P-0
Name of the Course	**INDUSTRIAL TRAINING**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 40**
Continuous Assessment	**Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

This training will be related to industrial projects/ software projects to be undertaken under the guidance of faculty preferably at industry/ software park/ incubation center or related areas. This may also be undertaken with in the institute. This training will be undertaken during vacation. Student is supposed to submit the project report at the end of the training.

Evaluation will be based on project report, presentation and comprehensive viva-voce examination related to the project.

Department Elective -I

SEMESTER – VII

UNIX/ LINUX ADMINISTRATION (CS - 7010)

Course Code	**CS – 7010**	Credits : 4	L-3, T-1, P-0
Name of the Course	**LINUX/UNIX ADMINISTRATION**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A

Introduction to LINUX and UNIX, Architecture of UNIX operating system, System Structure, User perspective, Essential tasks of system administrator, LINUX installation

Booting and shutting down : Boot strapping /Booting/Boot Loaders (LILO, GRUB), booting single user mode, rebooting and shutting down

System Management : Super user, choosing root password, system configuration, system directories & files, Performance analysis tools & processes

Section B

User management : Password files, managing user environment, adding user, removing user, login access, disabling user, account management utilities, managing groups, light weight directory access protocol.

File Management : Path names, mounting and unmounting files systems, file tree, file types, file attributes, configuring RAID devices,

Process management: components of a process, (PID, PPID, UID, EUID,) signals, send signals, (kill, killall), process states, nice and renice, monitor processes, (ps, top), runway processes

Section C

Adding a Disk : Disk interfaces, disk installation procedure, ext2 and ext3 file systems,FSCK(check and repair file systems), Adding a disk to linux

Devices and printer : serial standard, alternative connectors, hard and soft carriers, serial device files, software configuration for serial devices, configuration of hardware terminals, special character and terminal drivers, modems, common I/O ports multimedia devices(sound, video and DVD), installing sound, network & other cards

Section D

Backup devices and media ,setting up backup using dump, restore.

System and Log files: logging policies, LINUX LOG files, LOGROTATE, SYSLOG, condensing log files to useful information

Kernal Administration: precautionary steps for modifying kernel, kernal adaptation, configuration methods, building a LINUX kernel

TEXT BOOKS:

1. Richard L. Petersen " LINUX the complete reference "
2. Maurice J. Bach " The design of UNIX operating System "
3. Evi Nemath, Garth Snyder , Trent R Hein " Linux Administration Hand Book "

REFERENCE BOOKS:-

1. "The UNIX programming Environment "Brain Kernighem & Rob Pike
2. "Introduction to UNIX & LINUX " John Muster
3. Advanced UNIX programmer's Guide " Stephen Prato
4. "UNIX concepts & Applications Featuring SCO UNIX & LINUX " 2nd Ed. Sumitabha D

SEMESTER – VII

Neural Networks and Fuzzy Logic(CS – 7011)

Course Code	**CS – 7011**	Credits : 4	**L-3, T-1, P-0**
Name of the Course	**Neural Networks and Fuzzy Logic**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Neural Network characteristics, History of development in Neural Networks Principles, Artificial Neural Net terminology, Model of a neuron, topology, learning types of learning, supervised, unsupervised, re-enforcement learning.

SECTION- B

Basic Hopfield Model, the perceptron, linear separability, Basic learning laws: Hebb's rule, Delta rule, Widrow & Hoff LMS, learning rule, correlation learning rule, instar and outstar learning rules.

Unsupervised learning, competitive learning, K-means clustering algorithm, Kohonen's feature maps.

SECTION – C

Radial Basis Function neural networks, basic learning laws in RBF nets, recurrent networks, recurrent back propagation, Real Time Recurrent learning algorithm.

Introduction to counter propagation network, CMAC network, ART networks.

SECTION – D

Fuzzy logic: Basic concepts of Fuzzy logic, Fuzzy Vs Crisp set, Linguistic variables, membership functions, operations of fuzzy sets, fuzzy IF-THEN rules, variable inference techniques, de-fuzzification techniques, basic fuzzy inference algorithm, Applications of fuzzy system, useful tools supporting design.

Reference books:

1. Fuzzy Systems Design Principles, Building Fuzzy IF-THEN Rule Bases By Riza C.Berkin & Trubatch. IEEE Press ISBN 0-7803-1151-5.
2. Yegna narayanam – Artificial Neutral Networks.
3. Bart Kosko – Neural Networks & fuzzy logic.
4. Simon Haykin – Neutral Networks.
5. Ross.T. – Fuzzy Logic.

SEMESTER – VII

DIGITAL SYSTEM DESIGN(EC (ID)– 7005)

Course Code	**EC(ID) – 7005**	Credits : 4	L-3, T-1, P-0
Name of the Course	**DIGITAL SYSTEM DESIGN**		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)	**Max. Marks: 50**		

Instructions

1. **For Paper Setters**: The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates**: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

INTRODUCTION: Introduction to Computer aided design tools for digital systems. Hardware description languages; introduction to VHDL, data objects, classes and data types, Operators, Overloading, Logical operators. Types of delays Entity and Architecture declaration. Introduction to behavioral, data flow and structural models.

SECTION – B

VHDL STATEMENTS: Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements.

Subprograms: Application of Functions and Procedures, Structural Modeling, component declaration, structural layout and generies.

SECTION – C

COMBINATIONAL CIRCUIT DESIGN:VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders, code converters, comparators, implementation of Boolean functions etc.

SEQUENTIAL CIRCUITS DESIGN: VHDL Models and Simulation of Sequential circuits.

Shift Registers, Counters etc.

SECTION – D

DESIGN OF MICROCOMPUTER: Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL.

DESIGN WITH CPLDs AND FPGAs:Programmable logic devices: ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs.

REFERENCE BOOKS:

1. IEEE Standard VHDL Language Reference Manual (1993).
2. Digital Design and Modelling with VHDLand Synthesis: KC Chang; IEEE Computer Society Press.
3. "A VHDL Primmer": Bhasker; Prentice Hall 1995.
4. "Digital System Design using VHDL": Charles.H.Roth; PWS (1998)
5. "VHDL-Analysis & Modelling of Digital Systems" : Navabi Z; McGraw Hill.
6. VHDL – IV Edition: Perry TMH (2002)
7. "Introduction to Digital Systems": Ercegovac. Lang & Moreno; John Wiley (1999).
8. Fundamentals of Digital Logic with VHDL Design: Brown and Vranesic; TMH (2000).
9. Modern Digital Electronics – III Edition: R.P.Jain; TMH (2003)

SEMESTER – VII

Microelectronics Devices & VLSI technology (EC - 7010)

Course Code	**EC – 7010**	Credits : 4	L-3, T-1, P-0
Name of the Course	Microelectronics Devices & VLSI technology		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A.

INTRODUCTION

Gernal Classification of Intergarted Circuits.Advantages of IC's over Discrete Components.Introduction of Microprocessor .Computer Generation.Thick Film and Thin Film Hybrid IC's. Feature of Hybrid IC Technology . Thick Film Technology. Thick film processing Thick Film Substrates . Advantage and Application of Thick Film Hybrids. Thin Film Technology. Thin Film Processing. Advantage and Application of Thin Film Hybrids

Section B

SEMICONDUCTOR DEVICES FUNDAMENTALS

Semi-conductors Materials. Elements of Crystallography. Silicon Crystal. Electronics and Holes. P-type and N-type Silicon. P-N Junction. Basic N-P-N Transistors Action. Transistors as an Amplifier. Large Signal Behaviour of Bipole Transistors. Small Signal models of Bipolar Transistors. Large Signal Behaviour of Junction Field-Effect Transistors. Small signal Model of JFET. Large Signal Behaviour of the MOS Field effect Transistors.Small Signal Model of the MOS Transistors in Saturation

Section C

MONOLITHIC IC PROCESSES

Refining and Growth of Silicon Crystals. SI-Wafer Preparation. Diffusion of Dopant Impurties. Diffusion System. ION Implantation. Thermal Oxidation. Photo Lithogarphy. Fine Line Lithography. Relative Plasma Etching. Chemical Vapour Deposition(CVD). Silicon on Insulators. Metallization

Section D

MONOLITHIC PROCESS

Epitaxial Devices and Their Charcterstices.Bipolar IC Process.P-N Juction Isolation. Monolithic Bipolar transistors Constructors.Dielectric Isolation.Isopalaner and other IC Structure. Monolithic Diodes. Monolithic Junction FETs . Mosfet Technology. Short Channel MOS Structures. Typical NMOS IC Technologies for VLSI Chips. Complementary – Symmetry MOSFET Technologies. Monolithic Resistors . Monolithic Capicitors. IC Crossovers. Process Facilities and Monitoring.

Reference Books:

1. Integrated Circuits – K.R. Botkar
2. VLSI Design Techniques – Geigar BR, Allenpe

SEMESTER - VIII

SEMESTER – VIII

DIGITAL SIGNAL PROCESSING (EC(ID) – 8001)

Course Code	EC(ID) – 8001	Credits : 4	L-3, T-1, P-0
Name of the Course	DIGITAL SIGNAL PROCESSING		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

INSTRUCTIONS

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Discrete – time signal analysis and linear systems: Signal analysis – signal characteristics – typical discrete – time signals – operation on signals – properties of linear time – invariant digital systems – Fourier transform relationship – sampling analog signals and sampling rate conversion. Z-transform; Properties of Z-transform-inverse, Z-transform – analysis of discrete time systems, convolution

SECTION – B

System function,difference equation

IIR filter design: analog filter approximation, Butterworth, Chebyshev and elliptic filters, bilinear transformations ,impulse invariance technique , digital frequency band transformations. FIR filter design : window technique ,equiripple approximation technique , frequency sampling technique .

SECTION – C

Discrete Fourier transform (DFT) and inverse Discrete time Fourier Transform: properties – circular convolution. Fast Fourier Transform (FFT): Decimation-in-time (DIT) algorithm-decimation-in-frequency algorithm-FFT ,Radix-2 DIT and DIF implementation.

SECTION – D

Finite Register Length Effects: Quantization noise introduced by analog-to-digital conversion-finite register length effects in the realization of IIR and FIR digital filters and in DFT computation. IIR and FIR filter realization scheme

Text Books:

1. *David.K.Defatta, Joseph G, Lucas and William S.Hodgkiss, Digital Signal Processing, John Wiley & sons, 1988.*
2. *Sanjit K and Mitra, Digital Signal Processing, Tata McGraw Hill, 1998.*

Reference Books:

1. *A.V.Oppeheim and R.W.Schaffer, Digital Signal and Processing, Prentice Hall.*
2. *Farooq Hussain, Digital Signal and Processing, Prentice Hall.*

SEMESTER – VIII

WEB DEVELOPMENT(CS-8001)

Course Code	**CS-8001**	Credits : 4	L-3, T-1, P-0
Name of the Course	**WEB DEVELOPMENT**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section A

An overview of Java : Object oriented programming ,Two paradigms, abstraction, the, OOP principles
Java class libraries

Data types, variables and arrays : Integers, floating point types, characters, Boolean, Iterates, Variable, Data types and casting, automatic type promotion in expressions arrays.

Operators : Arithmetic operators, bitwise operators, relational operators, Boolean logical assignment operators, the? Operator, operator precedence

Control statements : Java's selection statements, iteration statements, jump statements

Introduction to classes : Class fundamentals, declaring object reference variable, Introducing methods, constructors, the this key word, garbage collection, the finalize () method.

Methods and Classes : Overloading methods, using objects as parameters, recursion

Section B

Inheritance : Inheritance basics, using super, method overriding, dynamic method dispatch, using abstract Classes, Using final with inheritance
Package and Interfaces ,Package asses protection, importing packages

Exception handling : Exception handling fundamentals., Exception types, Uncaught Exceptions Using try and catch, multiple catch clauses, nested try statements throw, finally Java built in exception creating your own exception sub classes, using exceptions.

Multithreaded Programming

The Java thread model, the main thread, creating thread, creating multiple thread, using is alive() and join ().
Thread priorities, synchronization, Inter thread communications, suspending resuming and stopping thread using multithreading

String handling

The string constructor, string length, special string operator character extraction, string comparison, searching string, modifying string, data conversion, changing the case of characters, string buffer.

Abstract windowing Toolkit : Introduction to Applets, definition, steps to create applets, applet tags, parameter passing, major applet activities.

Section C

HTML : Tags, Formatting text, hyperlinks and color in web pages creating tables and frames. Working with images, maps and forms.

Scripting Languages :- JavaScript- Using Operators, statements, function, handling events and working with objects. Creating frames, Processing forms, using hidden fields and cookies. Working with links and images.

Section D

Active Server Pages (ASP) :- ASP basic architecture, Request Object, response Object, application Object, Session Object, Server Object Database Access in ASP.

XML :- Creating an XML document, Using element, declaration and examination attribute declarations, using XML in an HTML document, XML on the web.

Text books & References :

1. Java 2 Complete Reference (Tata McGraw Hill)
2. Core Java-I (Addison Wesley) - horstmann
3. Core Java - II (Addison Wesley)
4. Thinking in Java (Bruce Eckel)
5. HTML 4 By QUE
6. Active Server pages 3 Developers Guide- Alberto Manuel Ricart, Stephen Asbury, DIG Books India.
7. Teach Yourself HTML 4 With XML, DHTML and Java Script - Stephine Cottrell Bryant

SEMESTER – VIII

DIGITAL SIGNAL PROCESSING LAB (EC(ID) – 8005)

Course Code	**EC(ID) – 8005**	Credits :3	L-0, T-0, P-3
Name of the Course	**DIGITAL SIGNAL PROCESSING LAB**		
Lectures to be delivered	**39 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 20**
Laboratory **Continuous Assessment**	**Based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner (25 marks).
2. Viva-voice examination (25 marks).

Viva-voice examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS : -

Perform the experiments lab using DSP:

1. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine)
2. To develop program for discrete convolution.
3. To develop program for discrete correlation.
4. To understand stability test.
5. To understand sampling theorem.
6. To design analog filter (low-pass, band-pass, band-stop).
7. To design digital IIR filters (low-pass, high pass, band-pass, band-stop)
8. To design FIR filter using windows technique.
9. To design a program to compare direct realization values of IIR digital filter.
10. To develop a program for computing parallel realization values of IIR digital filter.
11. To develop a program for computing cascade realization values of IIR digital filter.
12. To develop a program for computing inverse Z-transform of a rational transfer function

SEMESTER – VIII

MAJOR PROJECT (CS – 8004)

Course Code	**CS – 8004**	Credits : 8	L-0, T-0, P-8
Name of the Course	MAJOR PROJECT		
Project evaluation	**Max. Time = 3 hrs.**	**Max. Marks: 150**	**Min. Pass Marks: 40%**
Laboratory **Continuous Assessment**	**On the basis of continuous review project report and viva voce**	**Max. Marks: 150**	**Min. Pass Marks: 50%**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i) Performing a practical examination assigned by the examiner (25 marks).

ii) Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

Project is one of the culmination points of the learning process, which puts to test the acquired ability of the candidate of independently take charge of project or system development. The effort should be made to open up a window of opportunity with the industry, the project can proceed in three steps using software engineering methodology. Preparation of requirement document

1. Preparation of Design Document.
2. Writing of Code its testing with demonstration cases.
3. An effort should be made by the institute faculty to liaison with the industry and conduct three reviews to meet the dead lines and satisfactory completion of the project.

The student can be given in campus live project to meet the needs of institution as well as providing training to meet the aims of the course.

Following format for documentation for the project be followed:

A. Forwarding Page
   1. Title of the project
   2. Objectives
   3. Definitions of Key Term
      - Approach to Problem solving
      - Limitations. If any
   4. Output Generated
   5. Details of Hardware Performed
   6. Details of Software Tools used
   7. Implementation issues(clearly defining the area of application)
   8. Miscellaneous
   9. Signature of candidate & date

B. Recommended Chapters/sections(Not Mandatory but only Guidelines)
   1. Microscope Summery
   2. Details of candidate and supervisor along with certificate of
      - Original work;
      - Assistance, if any;
      - Credits;
   3. Aims and Objectives
   4. Approaches to Project and Time Frame
   5. Project Design Description with appendices to cover
      - Flow charts/Data Flow Diagram – Macro/Micro Level
      - Source code, If any
      - Hardware plateform
      - Software Tools
      - Security Measures
      - Quality Assurance
      - Auditability
   6. Test Date and Result

SEMESTER – VIII

CORE JAVA AND WEB DEVELOPMENT LAB(CS – 8006)

Course Code	**CS – 8006**	Credits :2	L-0, T-0, P-2
Name of the Course	**CORE JAVA AND WEB DEVELOPMENT LAB**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 20**
Laboratory **Continuous Assessment**	**Based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

1. Performing a practical examination assigned by the examiner (25 marks).
2. Viva-voice examination (25 marks).

Viva-voice examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

LIST OF EXPERIMENTS : -

1. Write a program to detemine the sum of the following Harmonic series for n=8:
   1+1/2+1/3+……+1/n
2. Write a program to read the price of an item in decimal form(like 75.95) and print the output in paise (like 7595).
3. Write a program to convert the given temperature in fahrenheit to celsius using the following conversion formula
   C=(F-32)/1.8
   And display the result in tabular form
4. Write a program to find the even and odd numbers from 1 to 50.
5. Write a program to print the following pattern:

   1
   2 2
   3 3 3
   4 4 4 4
   5 5 5 5 5

6. Write a program to find the factorial of a given no.
7. Write a program to print the fibonacci series
   0,1,1,2,3,5,8……n for any given value of n
8. Write a program using switch statement to print the following grade according to the percentage of the student

GRADE	PERCENTAGE
Hon ours	above 75%
First division	60% - 75%
Second division	50% - 60%
Third division	40% - 50%
Fail	less than 40%

9. Write a program to compute the sum of the digits of a given integer no.
10. Design a Class to represent a bank account. Include the following details

Data Members:

1. Name of the depositor
2. Account number
3. Type of Account
4. Balance amount in account

Methods:

1. To assign initial values
2. To deposit an amount
3. To withdraw an amount after checking the balance
4. To display the name and balance

SEMESTER – VIII

Web Technology Lab (CS-8007)

Course Code	**CS-8007**	Credits : 2	L-0, T-0, P-2
Name of the Course	**Web Technology Lab**		
Lectures to be delivered	**26 hours of Lab sessions**		
Semester End Examination	**Max. Time = 3 hrs.**	**Max. Marks : 50**	**Min. Pass Marks: 20**
Laboratory	**Continuous Assessment (based on Lab work 30%, Lab record 25%, Viva 25%, Attendance 20%)**	**Max. Marks: 50**	**Min. Pass Marks: 25**

Instructions for paper setter/Candidates

Laboratory examination will consist of two parts:

i. Performing a practical examination assigned by the examiner (25 marks).
ii. Viva-voce examination (25 marks).

Viva-voce examination will be related to the practicals performed/projects executed by the candidate related to the paper during the course of the semester.

List of Experiments:

1) Develop a home page giving description of your institute using various HTML tags.

2) a) Create a **Web** page which opens three new browser windows displaying blank documents. It then asks the user (through a prompt window) to enter a message. Following that, it asks the user for an integer number between 1 and 3. Your program should display the message the user typed on the window the user specified. For instance, if the user entered in the first prompt window the message "Hello world" and in the second prompt window he / she entered the number "2" then your program should display the phrase "Hello world" on the second window.

b) Extend your program such that if the user fails to enter an integer number between 1 and 3 then an error message is displayed in an alert window. Then, the prompt window is re- displayed asking the user to re-enter a number between 1 and 3.

3) (Frame Messenger) Repeat **experiment** 2 this time using frames (instead of windows).

4) (Form Navigator) Create a **Web** page which splits the browser window into two frames with sizes of your choice. The top frame has a text area and a button labeled "discover". The bottom frame contains an HTML form with a few elements such as text fields, text areas, checkboxes, radio buttons, etc, of your choice. The form should have at least *5 elements*. Write a JavaScript function to be included in the HTML page displayed in the top frame which should be activated once the user presses the button "discover". The function should "scan" the HTML

5) Create a **web** page which asks the user to enter two numbers (floats). Your **web** page also provides four buttons with the labels *add*, *subtract*, *multiply* and *divide*. When the user presses one of the buttons, your JavaScript program should perform the appropriate calculation and display the result on an alert window. So for example if the user enters the numbers 100 and 200 and presses the button *Subtract* then the new alert window should display the value –100.

b) Extend you program such that if the user presses one of the four buttons without having entered any numbers yet then an alert window is displayed with the message "Sorry, you have to enter two numbers before pressing this button".

c) It is well known that dividing by zero does not make sense. Extend your program such that the user is warned over a division by zero.

6) (Maximum Number) a) Create a **web** page which asks the user to enter an integer *n* representing the number of numbers he / she wishes to enter. So if the user enters the number 10 this means she / he wishes to enter 10 distinct numbers. Your program should then display a prompt window *n* times, sequentially, to ask the user to type in his / her numbers, one at a time. Your JavaScript program should calculate the maximum of these numbers and display it on an alert window.

b) Extend your program such that it not only discovers the maximum but also calculates the total sum of the numbers entered

7) Write an ASP script that sends to the browser the form shown below (in which the user can specify a number n), and a table displaying the first n integers (starting at 1) along with the square root of each. You may need to use some VBScript functions, like isNumeric(), Int() and Sqr():

8) Develop a login page to authenticate a user :

Login	
User ID:	
Password:	
New OK Cancel	

9) Develop a web page that display the profile of a member user. Profile is to be stored & retrieved from database.

10) Using web technologies learned so far Develop your own website of your branch

Department Elective -II

SEMESTER – VIII

DIGITAL IMAGE PROCESSING (CS-8008)

Course Code	**CS-8008**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Digital Image Processing**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section-A

Introduction: Introduction to Image Processing; Elements of image processing systems; Image representation and modeling. Digital Image Fundamentals: An Image model; Sampling and Quantization; Some basic relationships and pixels; Camera model; Camera calibration; Electrographic projections; Elementary idea of photographic films.

Section-B

Image Transforms: Introduction to Fourier transforms; The discrete Fourier transform; Some properties of the 2 - D Fourier transform; The Fast Fourier Transform; Other separate Image transforms – Walsh and Haugh.Image Enhancements Background; Special domain method; Frequency - domain methods; Image enhancement by histogram; Modification technique; image smoothing; Neighborhood avenging; Median filtering; Low pass filtering; Image sharpening; Sharpening by differentiation High pass filtering; Pseudo color image processing-color fundamentals; Density swing; Grey - level to color transformations.

Section-C

IMAGE RESTORATION: Degradation model; Some definitions; Degradation model for continuous Functions; Discrete formulations; Diagonalisation of circlet and Mock circlet Matrices ; Effects of diagonalisation on the degradation model.

Section-D

IMAGE ENCODING: Fidelity criteria; The encoding process 8.

IMAGE SEGMENTATION: The detection of discontinuities; Point detection; Line detection; Edge detection, Edge - linking and boundary detection; Thresholding – foundation, the role of elimination; A global thresholding technique.

Text Books:

1. Gonzalez Rafel.C & Wintz Paul : DIGITAL IMAGE PROCESSING; Addison- Wesley.
2. Jain Anil K: FUNDAMENTALS DIGITAL IMAGE PROCESSING; Prentice Hall

References:

1. Jensen,J.R. :INTRODUCTION TO DIGITAL IMAGE PROCESSING; Prentice Hall
2. Pratt William K: DIGITAL IMAGE PROCESSING; John Wiley and Sons
3. Rosenfield Azriel, Kak Avinash C: DIGITALPICTURE PROCESSING; Academic Press Inc.

SEMESTER – VIII

SOFTWARE MAINTENANCE(IT – 8016)

Course Code	**IT – 8016**	Credits: 4	L-3, T-1, P-0
Name of the Course	**SOFTWARE MAINTENANCE**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions:-

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Fundamentals: Meaning of software maintenance, software change, ongoing support, economic implications of modifying software, the nomenclature and image problem, software maintenance framework, potential solutions to maintenance problem.

Maintenance process models: Definitions, critical appraisal of traditional process models, maintenance process models.

Program understanding: Aims of program comprehension, maintainers and their information needs comprehension process models, mental models, program comprehension strategies, factors that affect understanding, implications of comprehension theories and studies.

SECTION – B

Reverse Engineering: Definitions, purposes and objectives, levels of reverse Engineering, supporting techniques, benefits.

Reuse and reusability: Definitions, objective and benefit of reuse, approach to reuse, domain ANALYSIS, COMPONENTS Engineering, reuse process model, factors that impact upon reuse.

Maintenance measures, Definitions, objectives of software measurement, example measures, guidelines for selecting maintenance measures.

SECTION – C

Configuration management: Definitions, configuration management, change control, documentation.

Management and organizational issues, Management responsibilities, enhancing maintenance productivity, maintenance teams, personnel education and training, organization modes.

SECTION – D

Building and sustaining maintainability: Quality assurance, fourth generation languages, object oriented paradigms.

Maintenance tools: Criteria for selecting tools, **taxonomy** of tools, program understanding and reverse engineering testing, configuration management, and other tasks. Past present and future of software maintenance.

Books:

1. Software Maintenance: concepts and Practice, Armstrong A Takang and Penny A.Grubb, International Thomson Computer press, London.

SEMESTER – VIII

OPTICAL COMMUNICATION (EC-8013)

Course Code	**EC-8013**	Credits : 4	L-3, T-1, P-0
Name of the Course	**OPTICAL COMMUNICATION**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 100	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Need for Fiber Optic Communications System, Role of Fiber Optic communication technology, Basic Block Diagram, Advantages & Disadvantages of Optical Fiber Communication, Ray Theory, Electromagnetic Mode Theory, Step Index Fiber, Graded Index Fiber, Attenuation- Bending Loses, Scattering, Absorption, Dispersion – Intermodal, Chromatic, limitations & remedies.

SECTION – B

Light sources & Transmitters – Light Emitting Diodes, laser diodes, Principle of action, characteristics, efficiency, Block Diagram and typical circuits of Transmitter.

SECTION – C

Receivers, Photodiodes - Working, Power relationship, PIN photodiodes, Avalanche photodiode, Block Diagram & typical circuits of receiver.

SECTION – D

Fiber Cable Connecterization– Splicing, Connectors, components of Fiber Optic Networks, Tranceivers, Semiconductor, optical amplifiers - Principle of operation, Gain, Bandwidth, Crosstalk, Noise, Applications, Advantages& Disadvantages. Erbium Doped Fiber Amplifiers(EDFAs) - Operation, gain, noise, Components of EDFA module

Books Recommended:

1. Fiber Optic Comm. Systems – D.K.Mynbaev Pearson Education.
2. Optical Fiber Comm. Principle – John M.Senior PHI Pub.
3. Optical Fiber Comm. Principle – G.Keiser.

SEMESTER – VIII

CELLULAR AND SATELLITE COMMUNICATION(EC(ID) – 8014)

Course Code	**EC (ID)– 8014**	Credits : 4	**L-3, T-1, P-0**
Name of the Course	**CELLULAR AND SATELLITE COMMUNICATION**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Mobile Telephone Service, Evolution of cellular Telephone, Fundamental Concepts of Cellular Telephone, Fundamental Concepts of Cellular Telephone, Frequency Reuse, Interference, segmentation & Dualization, Cellular System Topology, Roming & Handoffs, Cellular Telephone network Components, Cellular Cell processing.

SECTION- B

First Generation Analog Cellular Telephone, Second Generation Analog Cellular telephone, Personal Comm. Systems, digital Cellular telephone, CDMA Cellular Radio network, Global Systems for Mobile communication.

SECTION – C

Principle of Satellite Comm., Kepler's law, Geosynchronous Satellite, Antenna look angles, Satellite classifications spacing and Frequency allocation, Satellite antenna Radiation patterns, Footprints, Satellite link models, Parameter & Equations.

SECTION – D

FDM/FM Satellite Systems, Multiple accessing – FDMA, TDMA, CDMA, Channel Capacity Special purpose Comm. Satellites, INTELSAT, VSAT (data broad – band Satellite), MSAT. LEOs (lower Earth Orbit Satellite), Defence Satellites.

Reference books:

1. Advanced Electronic Communications Systems: Wayne Tomasi.
2. Electronic Communications: Dennis Roddy & John Coolen.

OPEN ELECTIVE

Semester-VIII

COMMUNICATION SYSTEMS (EC – 8020)

Course Code	EC – 8020	Credits : 4	L-3, T-1, P-0
Name of the Course	COMMUNICATION SYSTEMS		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		Max. Marks: 50	

Instructions

1. For Paper Setters: The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. For candidates: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

PULSE COMMUNICATION: Information In a communication system, coding, noise in an information carrying channel, Types of pulse modulation, Pulse Amplitude modulation (PAM), Pulse Width Modulation (PWM), Pulse Position Modulation (PPM), Pulse code Modulation (PCM), Telegraphy (& Telex), Telemetry.

SECTION – B

BROADBAND COMMUNICATION SYSTEMS: Frequency division multiplexing, Time division multiplexing, Short & Medium Haul systems – Coaxial Cables, Fiber Optic Links, Microwave Links, Tropospheric scatter links, Long Haul Systems – Submarine cables, Satellite communications.

SECTION – C

SATELLITE COMMUNICATION: Introduction, Orbits, Station keeping, Orientation of Satellite, Transmission Path, It's losses & noise consideration, Satellite Systems, Saturation flux Density, effective Isotropic radiated Power, SPADE, TDMA.

SECTION – D

FIBER OPTIC COMMUNICATION: Introduction, Principle of light transmission in a fiber, Effect of Index profile on Propagation, Modes Of propagation, Number of modes via fiber, Single mode propagation, Rayleigh scattering losses, Absorption losses, mode coupling losses, bending losses, combined losses.Effects of Dispersion on Pulse Transmission, intermodal dispersion, material dispersion, waveguide dispersion, total dispersion, fiber optic communication system.

BOOKS:

1. Electronics communication systems by Kennedy & Davis, TMH.
2. Electronics Communication by Dennis Roddy & John Coolen.

Semester-VIII

RELIABILITY OF ELECTRONICS COMMUNICATION SYSTEM (EC-8021)

Course Code	**EC-8021**	Credits-4	**L-3, T-1, P-0**
Name of the Course	**Reliability Of Electronics Communication System**		
Lectures to be Delivered	**52 (1 Hr Each) (L=39, T=13 for each semester)**		
Semester End Examination	**Max Marks: 100**	**Min Pass Marks: 40**	**Maximum Time: 3 hrs**
Continuous Assessment (based on sessional test (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			**Max Marks: 50**

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section A

Basic Definitions, concept and need for reliability, inherent value of reliability in modern system, hazard rate, failure density function, mean time to failure & repair. Relationship between basic variables, analytical form of reliability function. Derivation for the exponential distribution function and Webiull distribution.

Section B

Different type and modes of failures, causes of failure in different systems, systems structures, series, parallel, stand by, K-out-of-n configuration their reliability analysis.

Reliability evaluation techniques applicable to general non-series parallel system. Markov processes for repairable & no repairable system & their applications in reliability analysis..

Section C

Maintainability, analysis of down time, Repair Time Distribution, Stochastic Point Processes, System Repair Time, Reliability under Preventive Maintenance, State Dependent Systems With Repair Maintenance Requirements.

Availability, concepts & definitions, Exponential Availability model, System availability, Inspection & Repair availability model, design trade-off Analysis.

Section D

Data collection & Empirical Methods- Data collection, Empirical methods, static life estimation.

Reliability Testing- Product testing, Reliability Life testing, Test time calculations, Burn in testing, Acceptance testing, accelerated life testing, experimental design, Competing failure models.

Books:

1. Concepts in Reliability by L.S. Sri Nath.
2. Reliability Engineering by Balaguruswamy :
3. Reliability and Maintainability Engineering by Charles E. Ebeling.

Semester-VIII

Computer Based Measurement And Control (EC-8001)

Course Code	EC-8001	Credits-4	L-3, T-1, P-0
Name of the Course	Computer Based Measurement And Control		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

(TITLE APPROVED CONTENTS TO BE DECIDED LATER)

SEMESTER – VIII

NON CONVENTIONAL ELECTRICAL POWER GENERATION(EE-8008)

Course Code	**EE-8008**	Credits : 4	L-3, T-1, P-0
Name of the Course	**NON CONVENTIONAL ELECTRICAL POWER GENERATION**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions:-

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Energy situation and renewable energy sources: Global Energy scenario, World Energy consumption, Energy in developing countries, fire wood crisis, Indian energy scene, Non conventional renewable energy sources, potential of renewable energy sources.

SECTION – B

Wind Energy: Origin of wind, Basic principle of wind energy, conversion, component of wind energy conversion system, type of windmills, Wind electrical Generations in India.

Solar Energy: Introduction, solar radiation, solar energy collector, solar thermal power generation, low temperature application of solar energy.

SECTION - C

Geo-thermal Power Plants: Introduction, Geothermal sources, comparison of Geo thermal energy with other energy forms, development of Geothermal power in India.

Physical and thermochemical methods of bioconversion: Introduction, biomass definition and potential, physical method of bio conversion, thermo chemical methods.

SECTION – D

Wave, Tidal and OTEC: Introduction, Basic principle of tidal power, Wave energy, component of Tidal power plant, Ocean Thermal Energy Conversions, advantages and disadvantages of tidal power generation.

Small and Mini Hydro power System: Introduction, site development, generation and electrical equipment, system of regulation of Hydroelectric Power in India.

BOOKS:

1. Renewable Energy Sources – Maheshwar Dyal.
2. Small and mini Hydropower system by Tata Mc Graw Hill.
3. An Introduction to power plant technology – G.D.Rai.
4. Solar Energy – Suhas.P.Sukhatma, Tata Mc Graw Hill.
5. Modern Power Plant Engg. – Joel

SEMESTER – VIII

ENERGY ASSESSMENT AND AUDITING(EE-8009)

Course Code	**EE-8009**	Credits : 4	L-3, T-1, P-0
Name of the Course	**ENERGY ASSESSMENT AND AUDITING**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1.For Paper Setters: The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

2.For candidates: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

ENERGY MANAGEMENT PRINCIPLES: Systems of Energy flow, principles of Energy flow and Energy conservation, Energy and money, Energy and growth, flow of energy in ecological system, Energy efficiency and demand side management (DSM), Economic evaluation.

SECTION – B

ENERGY AUDIT: Concepts and benefits of Energy Audit, Types of Energy Audits, National Energy Plan and its impact on energy conservation, Energy accounting and analysis, Energy audits of building systems, electrical systems, maintenance and energy audits.

SECTION - C

MEASURING INSTRUMENTS: Temperature measuring instruments, combustion system measuring instruments, measurement of heating, ventilation and air conditioning system performance.

SECTION – D

ENERGY CONSERVATION IN INDIAN SCENARIO: Energy demand and consumption in Indian industries, potential for energy efficiency in Indian industry, government's role in energy conservation and energy efficiency, Energy conservation techniques – conservation in energy intensive industries, economic evaluation of conservation techniques.

BOOKS:

1. Handbook of Energy Audits by Albert Thuman – Fairman Press Inc.
2. Energy basis for man and nature by Howard T.Odum & Elisbeth.C.Odum.

Semester-VIII

Development of Knowledge Management (IT-8012)

Course Code	IT-8012	Credits-4	L-3, T-1, P-0
Name of the Course	Development of Knowledge Management		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

(TITLE APPROVED CONTENTS TO BE DECIDED LATER)

Semester-VIII

PROFESSIONAL ISSUES IN IT (IT-8013)

Course Code	IT-8013	Credits: 4	L-3, T-1, P-0
Name of the Course	PROFESSIONAL ISSUES IN IT		
Lectures to be delivered	52 (1 Hr Each) (L = 39, T = 13 for each semester)		
Semester End Examination	Max. Time: 3 hrs.	Max. Marks: 100	Min. Pass Marks: 40
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		Max. Marks: 50	

Instructions

For Paper Setters: The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.

For candidates: Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION-A

Legal Issues: Introduction to legal concepts, Basic outline of Criminal and Civil Laws, Concepts relating to laws and Contract and Commercial Law, Substantive legal issues, Intellectual property issues, Cyber crime, Data protection principles and implications of the European union Data protection Directive, Confidentiality and privacy, Intellectual property rights, Copyright and Industrial Property, Patents, Trade marks and laws relating to designs, Software protection and piracy, Dealing with Copyright, Originality, Exception to Copyright infringement, Employees and freelance programs, devices to overcome Protection Software Licensing, Methods of licensing, Copyright and electronic publishing, Copyright problems posed by electronic publishing.

SECTION-B

Multimedia, licensing and related issues: Protection of databases, Trade marks and passing off, Internet related issues, Contact issues and Law, Basic understanding of the Types of the Agreements in large computerization projects-Implementation Agreements, Licensing agreements, Maintenance Agreements, etc. Enforcement issues, dispute resolution, arbitration, legislative action.

SECTION-C

Other Professional issues: Duties of a professional, Duties to client, Duties to Employer, Duties to Profession, Duties to society, Accountability for quality, timeliness and use of resources, Human relationships and change management, Avoiding computer misuse, Hacking, unauthorized access and types of Computer Crime, Introduction of Viruses, Fraud and types of computer frauds, implications arising from the Draft Computer Crimes Act under the section D.

SECTION-D

Characteristics of Professions, Integrity and Honesty, Competence, Professional development, judgment, knowledge of law, relations, standards, independence, Acting with responsibility, Professional skill, comply with law, Confidentiality, due care, Contribute towards advancements of human welfare, Public interest, Public awareness, Basic Human rights, Ethics, and the Internet, Netiquette and Policy approaches, Professional relationships, Are computer professionals "Professionals", Conflicting responsibilities and misconduct, Codes of Ethics.

TEXT BOOK:

- Professional Issues In Software Engineering(2nd edition), Bott F.et al.,1995,UCL Press.

REFERENCE BOOKS:

- (Eds), The Responsible Software Engineer, Selected Readings in IT Preofessionalism, Myers C.,Hall T. and Pitt D.,1997, Springer.
- BCS Code of conduct: http://www.bcs.org/docs/01100/1194/pdf/codeofc.pdf
- BCS Code of practice: http://www.bcs.org/docs/01100/1194/Cop.htm
- ACS code for Ethics: http://203.58.197.209/acs/events_admin/static/national/pospaper/acs131.htm
- ACS Professional conduct and professional practice: http://203.58.197.209/acs/events_admin/static/national/pospaper/code2.htm

Semester-VIII
Computer Aided Fine Arts (IT-8014)

Course Code	IT-8014	Credits-4	L-3, T-1, P-0
Name of the Course	Computer Aided Fine Arts (IT-8014)		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section A

Painting and Drawing Software applications: Drawing Software: Illustration applications (vector graphics), painting applications (bitmapped graphics) Drawing devices: Digitizing tablet, pressure sensitive stylus, mouse, touch screen.

Collect and present examples of the use of digital painting and drawing in contemporary sources. Use drawing and painting software applications creatively to present a range of work.

Section B

Image Manipulation: Software Applications: Any software which will have features like distortion, adjust colour range, contrast, palettes and a range of tools with which to paint and adjust images files.

Digities: Digital photography, scan, digitize.

Objects : found objects, natural objects, domestic tools.

Image: Photographs, found images, own visual work, hand written text, word-processed text.

Digitize a range of objects and images in an appropriate file format for further development

Manipulate and present scanned images in a range of way

Section C

Typographic design: Font design software: any software that will enable experimentation with Bitmapped fonts, postscript fonts, and True type fonts.

Typographic Design Software: any software that will enable students to experiment with fonts and font design using a range of tools. Investigate the potential of digital typography

Produce a range of work showing the creative use of typography, Combine typography with image in innovative ways.

Section D

Desk Top publishing and Text Editor: Text editing Software: Proprietary word processing applications with automated routines e.g. word count, spell checker, formatting styles, font styles, headers and footers. Design a range of page layouts using traditional methods, Prepare digital layout grid with common page elements, Prepare image, graphic and text files for the use in page layout, Format document and check for accuracy, and present in an appropriate format for print.

Books: -

1. B. Saraswati, Computerizing Cultures, New Age International Publishers, New Delhi.

Semester-VIII

ENTREPRENEURIAL DEVELOPMENT & NEW ENTERPRISE MANAGEMENT(HU-8020)

Course Code	HU-8020	Credits-4	L-3, T-1, P-0
Name of the Course	ENTREPRENEURIAL DEVELOPMENT & NEW ENTERPRISE MANAGEMENT		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

SECTION –A

- Developing Entrepreneurship: Element for a program.
- Developing Entrepreneurship competencies : Need & process of development, social determinants of Entrepreneurship growth.
- Entrepreneurship development programs.
- Entrepreneurship orientation & awareness programme.
- New enterprise creation programme.

SECTION- B

- Existing Entrepreneurship programmes for existing enterprising for survival & growth. Evolution of various EDP programme in India.
- Managing growth & transition, the organization life cycle, chasing Entrepreneurship roles.

SECTION- C

- Entrepreneurship & new venture opportunities.
- Planning for new ventures.
- Concept of planning paradigm – pre-startup, early growth & later growth stage.

SECTION- D

- Incentive & subsidies available for Entrepreneurship growth.
- Guidance for project report preparation.
- Location, Environmental and managerial problems of new enterprise management .
- Managing family business. Some case studies of family run business in India.

BOOKS:

1. Deshpande, (1980),” Entrepreneurship of small scale industries,” Deep & Deep, New delhi.
2. Peter Kibly,” Entrepreneurship & Economic development ,” The free press ,New York,(1971).
3. Rehman, A.H.M..,Habibur,(1979),” Entrepreneurship & small enterprise development in Bangladesh University of Dacca.
4. Sharma, K.L., (1981), Entrepreneurship & Industrial development in Punjab”,PSE economic analyst , Vol.II, No.2.
5. David H. Holt ,(1998),” Entrepreneurship-New ventura creation,” Prentice Hall , New Delhi.

Semester-VIII

Accounts And Financial Management (HU-8021)

Course Code	HU-8021	Credits-4	L-3, T-1, P-0
Name of the Course	Accounts And Financial Management		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section A

Accounting: Principle, Concepts and conventions, double entry system of accounting, introduction of basic books of accounts of sole proprietary concern, control accounts for debtors and creditors, closing of books of accounts and preparation of trial balance.

Final Accounts: Trading, Profit and Loss Accounts and balance sheet of sole proprietary concern with normal closing entries. Introduction to manufacturing account, Final accounts of Partnership firms, Limited company.

Section B

Financial Management: Meaning and role.

Ration Analysis: Meaning, advantages, limitations, types of rations and their usefulness.

Fund Flow Statement: Meaning of the terms – fund flow and fund working capital cycle, preparation and interpretation of the fund flow statement.

Section C

Costing: Nature, Importance and basic principles, Budget and budgetary control: Nature and scope, importance, method of finalization of master budget and functional budgets.

Marginal Costing: Nature, Scope and importance, break – even analysis, its uses and limitations, construction of break-even chart, practical application of marginal costing.

Section D

Standard Costing: Nature and Scope, Computational and analysis of variances with reference to material cost, labor cost and overhead cost, interpretation of the variances.

Introduction to computerized accounting system: coding logic and codes required, master files transaction files; introduction to documents used for data collection, processing of different file sand output obtained.

Books:

1. Kellock, J.: Elements of Accounting, Heinemann, 1978.
2. Rockely, L.E.: Finance for the Non-Accountant, 2nd Edition, and basic books, 1976.
3. Levy, and Sarnet: Principle of Financial Management, Prentice – Hall International.

Semester-VIII

Total Quality Management(HU-8022)

Course Code	HU-8022	Credits-4	L-3, T-1, P-0
Name of the Course	Total Quality Management		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates**: Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section-A

Introduction to TQM & ISO 9000, Total Quality Control, Customer Focus & Total waste Elimination (TWE), Quality Assurance

Quality of Design & Development, Inspection & Measurement workforce Teams, Benchmarking, TQM for Sales Marketing Management.

Section-B

Business Process Re-engineering & Information Technology, Quality control SQC/ SPC, Technology & Product Quality, Quality for After Sales Services Technology & Product Quality.

Section-C

Organization for Quality, Reliability as quality characteristics, Quality leadership, Quality linked productivity, Total Quality, Culture, Quality and environment, Cost of Quality.

Section-D

Cost of Quality, Quality Control for Export Units, Quality Maturity and Discipline, Total commitment for Quality, TQM Implementation, ISOm 9000 series of standards, ISO 9000-1, ISO 9000-2, ISO 9000-3.

References:-

1. TQM & ISO 14000: K.C.Arora.
2. Total Quality Control: Armand V. Feigenbaum.
3. Total Quality Management: Joseph.A.Patrick, Diana.S.Furr.
4. Total Quality Management – Text: Joel E. Ross Cases & Readin
5. Total Quality Control Essentials: Sarv Singh Soin

SEMESTER – VIII
ADVANCED OPERATIONS RESEARCH (ME – 8019)

Course Code	**ME – 8019**	Credits : 4	L-3, T-1, P-0
Name of the Course	**ADVANCED OPERATIONS RESEARCH**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION – A

Introduction to Operations Research

Formulation of problems, simplex method problem of degenerals, dual simplex method revised simplex method, bounded variable problems.

Integer Programming

Graphical method, the branch and bound technique, Gomary's ALL-IPP method, transportation model, unbalance in transportation, transshipment problem, sensitivity analysis in transportation problems.

SECTION – B

Dynamic Programming

Bellman's principle of optimality, examples on the application on routing problem, inventory problem, simplex problem, marketing problem.

Network Analysis

PERT and CPM, probability of achieving completion data, cost analysis, graph reduction theory, updating, resource allocation, resource smoothing.

SECTION – C

Inventory Method:

Variables in an inventory problem, inventory problem, inventory models with penalty, storage and quantity discount, safety stock, inventory models with probability, demand, multi item deterministic model.

Queuing Theory

Poison arrivals and exponential service times, waiting time and idle time cost, single channel multi channel problem. Monte technique applied to queuing problems, Poisson arrivals and service time.

SECTION – D

Decision Theory Game
Examples on the application of theory of games 2 XM and MX2 Problems, graphic dominance and linear programming method for different problems, decision trees.

Replacement Models
Replacement of items that deteriorate, gradually, fail suddenly, group placement policy, concept of system reliability.

Text Books:

1. Kumar Gupta, Prem and Hira, D.S., "Operations Research", S Chand & Company Limited, 1986.
2. Swarup, Kanti, Gupta, P.K. and Manmohan, "Operations Research", Sultan Chand & Sons, New Delhi 1988.
3. Srinath L.S., "PERT & CPM Principles and Applications", Affiliate East West Press (P) Limited, New Delhi, 1975.

SEMESTER –VIII
INDUSTRIAL MANAGEMENT(ME-8020)

Course Code	ME-8020	Credits : 4	L-3, T-1, P-0
Name of the Course	**INDUSTRIAL MANAGEMENT**		
Lectures to be delivered	**52 (1 Hr Each) (L = 39, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total

   Marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

Section – A

Management Concept

Management, administration, organization, Difference and relationship between management, administration and organization. Types of organization. Characteristics of management. Origin of principles of management. Beginning of scientific management. Scientific management, principles of management, functions of management, management development.

Personnel Management, Union and industrial relations

Definition and concept. Aims, objectives or functions or personnel management. Principles of good personnel policy. Recruitment and selection of employees. Safety engineering, labour welfare, Promotion, transfer, lay-off and discharge.

Trade unions, industrial disputes, settlement of industrial disputes, collective bargaining, union-management relations.

Section – B

Material, purchase and stores management.

Material management, purchase and procurement, Purchase organization, purchasing procedure. Stores and material control. Receipts and issue of materials. Store records.

Inventory control and management

Inventory, inventory – control, classification, management. Objectives of inventory control, functions of inventories, Economic order quantity, ABC analysis, material requirement planning.

Section – C

Financial Management

Concept and definition. Purpose of investment. Types of capital. Sources of finance. Book – keeping, terms used in book – keeping. Assets and liabilities. The journal and the ledger. Trading account, capitalization, capital structure, difference between capital, capitalization and capital structure.

Sales and marketing management

Sales management, sales organization, function of sales department, Selling concept v/s marketing concept. Marketing – definition, principles and functions. Marketing research, sales forecasting. Sales promotion. Advertising, international Advertising.

Section – D

Management by objectives

Definition and concept, objectives. Steps in setting up MBO, advantages of MBO, limitations of MBO.

Management information system

Definition, evolution of MIS, Need/objectives/functions of MIS. Difference between data and information. Need for information, information as an organizational resource. Management information categories. Designing information system. Computer system, components of computer system, integrated information system. Applications of MIS, future of MIS.

Text Books and References :

1. Industrial Management; Spregiel Johan N. York 1961.
2. Industrial Organization; Kimbell & Kimbell Vakils Fefter & Simons Pvt Ltd. Bombay 1971.
3. Industrial Engineering and Mangement Dhanpat Rai New Delhi1992.

SEMESTER – VIII

OPTIMIZATION METHODS FOR ENGINEERING SYSTEM(ME-8021)

Course Code	**ME – 8021**	Credits : 4	L-3, T-1, P-0
Name of the Course	**Optimization Methods for Engineering System**		
Lectures to be delivered	**65 (1 Hr Each) (L = 52, T = 13 for each semester)**		
Semester End Examination	**Max. Time: 3 hrs.**	**Max. Marks: 100**	**Min. Pass Marks: 40**
Continuous Assessment (based on sessional tests 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)		**Max. Marks: 50**	

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D & E. Section E will be compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C & D will have two questions from the respective sections of the syllabus and each question will carry 15% of the total marks of the semester end examination for the course.
2. **For candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E. Use of non-programmable calculators is allowed.

SECTION A

Introduction: Engineering Application; Statement of the Optimal Problem; Classification; Optimization Techniques;
Classical Method : Single Variable Optimization; Multivariable Optimization Without any Constraints with Equality and Inequality Constraints.

SECTION B

One-Dimensional Minimization Method: Unimodal Function; Elimination Method – Dichotomous Search, Fibonocci and Golden Method; Interpolation Method – Quadratic and Cubic Interpolation Method.
Unconstrained Minimization Method: Univariate, Conjugate Directions, Gradient And Variable Metric Method.

SECTION C

Constrained Minimization Method: Characteristics of a constrained problem;
Direct Method of feasible directions; Indirect Method of interior and exterior penalty functions.
Geometric Programming : Formulation and Solutions of Unconstrained and Constrained geometric programming problem.

SECTION D

Dynamic Programming: Concept of Sub-optimization and the principal of optimality: Calculus, Tabular and Computational Method in Dynamic Programming: An Introduction to Continuous Dynamic Programming.
Integer Programming : Gomory's Cutting Plane Method for Integer Linear Programming; Formulation & Solution of Integer Polynomial and Non- Linear problems.

Text Books:

1. Optimization (Theory & Application)- S.S. Rao, Wiley Eastern Ltd, New Delhi.
2. Optimization Concepts and Applications in Engineering – Ashok D.Belegundu and Tirupathi R Chandrupatla – Pearson Education 1999, First India Reprint 2002.

Reference Books:

1. Optimization: Theory and Practice, C.S.G. Beveridge and R.S. Schechter, McGraw Hill, New York.