SCHEME AND SYLLABUS

DEPARTMENT OF CIVIL ENGINEERING (B. Tech.)

FIRST SEMESTER

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
MTH111	Mathematics 1	3	-	-	3
CE112	Basic Civil Engineering	3	-	-	3
PHY113	Physics	3	-	-	3
HUM114	Communication Skills	3	-	-	3
CS115	Computer Programming	3	-	-	3
ME116	Engineering Graphics	-	-	6	3
CS117	Computer Program Lab.	-	-	3	2
PHY118	Physics Lab.	-	-	3	2
				Total Credits	22

I semester Soft Technology Division/ II semester machine Technology Division

SECOND SEMESTER

Course Number	Subject	Scheme of Studies Periods per week			Credits
		L	T	P	
MTH121	Mathematics 2	3	-	-	3
CHM122	Engineering Chemistry	3	-	-	3
CE123	Environmental Science	3	-	-	3
EE124	Basic Electronics and Electrical Engineering	3	-	-	3
ME125	Basic Mechanical Engineering	3	-	-	3
CE126	Solid Mechanics	3	-	-	3
ME127	Workshop Practice	-	-	2	1
EE128	Electronic and Electrical Lab.	-	-	2	1
CHM129	Chemistry Lab.	-	-	3	2
	Total Credits 22				

COURSE CONTENTS

FIRST AND SECOND SEMESTER (COMMON TO ALL B.TECH STUDENTS)

MTH111 MATHEMATICS 1

Partial differential equation- homogeneous functions, Euler's theorem, Taylor's series, maximum and minima of functions, Lagrange method of undetermined multipliers., Convergence and divergence series- summation of series, beta and gamma functions, length of curves, area volume and surfaces of solids of revolution, Ordinary differential equation statistics –solution, Claitauts forms, methods of variation of parameters.

References
1. Advanced engineering Mathematics   Erwin Krevszig, John Wiley & Sons
2. Advanced engineering Mathematics   Peter V.O.Neil Thomson, Cengage Learning
3. Higher engineering Mathematics   John Bird, Newnes Publishers

CE112 BASIC CIVIL ENGINEERING

Civil Engineering scope and importance, Construction materials such as Stone, Bricks and timber-Engineering properties, Soils, bearing capacity and its importance. Building components: Foundations- functions, types and applications, Walls, roofs, floors, doors, windows, beams, columns etc. Surveying basics and equipments.

References
1. Engineering Materials   Rangwala, Charotar Publishing House pvt. Ltd.
2. Building construction   Sushil Kumar, Standard Publisher dist.
3. Surveying   B.C. Punmia, Laxmi Publications

PHY113 PHYSICS

Electron ballistic-Motion of charges particles in electric and magnetic field, Electron microscope, Cathode ray tube, Spectrograph, Electron refraction. Bethes law; Solid state and Semi Conductor Physics- Energy bands in solids, Electron and hole mobility, hall effect, PN junction transistor, Transistor parameters, Photo cell and solar cell: Quantum Mechanics-weave equation, Schrodinger equation, tunnel effect, Harmonic oscillator: Laser and fiber optical- Ruby and He-Ne laser and applications, laser holography; Nuclear Physics & Theory of relativity-transformation equation, time dilation mass energy equation, Acoustics

References
1. Physics of dielectrics   Tareev, Mir Publishers
2. Principle of optics   Brijlal Subramanyam, S Chand & Company ltd.
3. Engineering Physics   P.G.Kshirsagar, S Chand Publisher

HUM114 COMMUNICATION SKILLS

Introduction to Communication Process, Verbal and Non-Verbal, Communication, Communication Barriers, Electronic devices in communication. Business communication- Managerial communication, meeting skills, group discussion, presentation skills, negotiation skills. Employment Communication. Speaking Skills, Listening Skills and Reading skills. Writing Skills- Letter writing, report writing, emails, proposals, memorandum, writing notices, minutes and agendas. Soft Skills and Personality Development- Time Management skills, interpersonal skills, Leadership styles, positive personal attitudes, personal SWOT analysis.

References
1. Effective business communications   Murphy, McGraw-Hill Companies
2. Effective technical communication,   M.Ashraf Rizvi, Tata McGraw-Hill Pub Co. Ltd.
3. The Ace of Soft Skills   Gopalaswamy and Mahadevan, Pearson Education

CS115 COMPUTER PROGRAMMING

Concepts, definitions, taxonomy and history of computer programming, operating systems and program execution, Unix system, Input/output devices, Storage devices, Flow chart and algorithm development, Computer program. C programming, Statements, Arrays and functions

References
1. Programming with C   Gottfried, McGraw Hill Education
2. C programming   Ritchie &Kernighan, Pearson Education India
3. UNIX programming   Kermighan &Pike, Pearson Education India

ME116 ENGINEERING GRAPHICS

Geometrical construction, use of instruments, scales, engineering curves, Orthographic projections, conversion of pictorial views to orthographic views and vice versa, Dimensioning, Projections of points, lines, planes and solids. Development of plane and curved surfaces, sections of solids. Orthographic projections of simple elements of machines like nut, bolt, rivets, keys and cotters, joints, pulleys, Introduction of Auto-CAD

 References
1. Engineering drawing with AUTOCAD   T.Jayapoovam, Vikas Publishing House
2.   Engineering graphics   K.R.Mohan, Dhanpat Rai Publishing Company
                                             Private Limited

CS117 COMPUTER PROGRAMMING LAB

Introduction to fundamentals of DOS and window, C programming, Operating System, Use of algorithms and execution, small practical problems, Arrays, Matrices.

References
1. Program with C   Brain W Kernighan, Prentice Hall
2. C programming   Balagurusamy, McGraw Hill Education India Private Limited

PHY117 PHYSICS LAB

Experiments on Zener Diode, characters tics, Newton Rings. Series/parallel resonance, Photo electric and Hall Effect.

References
1. Concepts of Modern physics   Arther Beiser, McGraw-Hill Education
2. A text book on advance practical Physics   Chauhan &Singh, Pragati Prakashan

MTH121 MATHEMATICS 2

Multiple integral: Multiple and triple integrations, series solution of differential equations Bessel and Legendre functions, Complex variable: Conformal mapping. Cauchy's theorem, Complex integration, Taylor's and Laurent's series, Laplace transform: Laplace transform of elementary functions, Inverse transform, and solution of ordinary differential equations. Vector calculus: Cross products, vector differentiation, gradient and divergent theorem, Green's Gauss and strokes theorem, Partial differential equations.

References
1. Advanced engineering Mathematics   Erwin Krevszig, John Wiley & Sons
2. Higher engineering Mathematics   John Bird, Newnes Publishers

CHM122 ENGINEERING CHEMISTRY
Lubricants: function of lubricates, solid lubricants, synthetic lubricants, mechanism of lubrication, testing of lubricants Fuels: classifications, calorific value, selection of lubricants ,knocking and anti-knocking compounds, combustion problems., environment Chemistry: air , water and soil, noise , soil and land, Corrosion: chemical corrosion, pitting, stress corrosion, galvanic series, corrosion control, Materials: Iron, steel, heat treatment, non ferrous metals, alloys

References
1. Engineering Chemistry   Jain and Jain, Dhanpat Rai Publishing Company
2. Engineering Chemistry   S.S. Dara, S Chand
3. Engineering Chemistry   Shashi Chawla, Dhanpat Rai & Co.
4. Engineering Chemistry   B.K. Sharma, Krishna Prakashan

CE123 ENVIRONMENT SCIENCE

Natural Resources: Study of various natural resources like forest, minerals, atmosphere, soil and water conservation. Ecosystem: structure, function and classification of ecosystem, biogeochemical cycle, hydrological cycle, carbon cycle, nitrogen cycle, oxygen cycle, food chain, food web, and energy flow in ecosystem. Biological diversity and its conservation, Global Environmental Issues, Case studies of environmental disasters like Bhopal Gas Tragedy, Chernobyl Nuclear Accident, and Concept of sustainable development. Environmental Pollution, pollutants and their classification, impact of pollution on environment. Types of pollution such as water, air, solid waste, noise, radioactive etc: sources, impact, Pollution control and environmental management, Basic concepts of Life Cycle analysis, Environmental Impact Assessment.

References
1. Environment engineering and management   Suresh K Dhaneja, S. K. Kataria & Sons
2. Environment science   S.C.Santra, New Central Book Agency (P) Ltd
3. Environment studies   J.P.Sharma, Pinnacle Technology
4. Waste water treatment   B.C.Punmia, Laxmi Publications

EE124 BASIC ELECTRONIC AND ELECTRICAL ENGINEERING

D.C. and A.C. sources: loop and nodal equations, superposition theorem, Norton's theorem Star Delta transformers. Simple series and parallel circuits and network analysis, Electrical machines: Faraday's law of electromagnetic induction, Lenz's law and tests on transformer, autotransformer, DC machines, Diodes and transistors: diode characteristics ripple factor, filter circuit, cathode ray oscilloscope, and Power supply.
References

1. Electrical technology   H Cotton, Reem Publications Pvt. Ltd
2. Electrical circuits   Schaum series, McGraw Hill Education
3. Electronics devices   Bell, Oxford

ME125 BASIC MECHANICAL ENGINEERING
Review of Thermodynamics: Units and Dimensions system, Heat and Work, Ideal gas equation. Thermodynamic equations, Zeroth law and first law of Thermodynamics. Enthalpy and Internal energy of gases. Simple numerical of first law as applied to a closed and open system. Statement of Second law of Thermodynamics, Steam Boilers, mountings & accessories. Boiler draught. Properties of Steam: Wet and Superheated steam, Volume, Enthalpy, Entropy and internal Energy of steam, Steam Table.
Internal Combustion Engines: Otto and diesel cycles and their efficiencies. Functions of different parts of the engines. Machine tool: lathe, shaper, drilling machine, types of drilling machine,

machining time for machine tool. Welding : Types of welding process, important terms in welding, types of welding joints, gas welding, arc welding ,comparison between A.C. and D.C. Casting: Pattern materials, types of patterns, pattern allowances, mould, constituents of moulding sand.

References
1. Elements of mechanical engineering   Gupta P.N and Poonia, Standard Publication
2. Elements of mechanical engineering   Roy and Choudhary, Media Promoters & Pub Pvt Ltd

CE 126 SOLID MECHANICS

Fundamentals of force systems, concept of Rigid body, Free body diagram Support Reactions, Analysis of Frames and structure. Centroid and moment of Inertia of plane area, Shear force and Bending Moment diagrams, Simple stress and strain, Mechanical properties of the materials, Elastic constants, compound stresses, Mohr's circle of stresses.

References
1. Strength of materials   Singer F.L., Longman
2. Mechanics of material   Hearn E.I., Butterworth-Heinemann
3. Engineering mechanics   Merian J.L.Kraige, Wiley

ME127 WORKSHOP PRACTICE

Students will do practice in following shop.
Carpentry (two models), 2. Fitting, (two models) 3. Foundry (demonstration) 4. Welding. (Demonstration)

References
1 Manufacturing science   Ghosh and Mallick, Affiliated East-West Press Pvt. Ltd

2 Manufacturing Technology   P.N. Rao, McGraw Hill Education

EE128 ELECTRONICS AND ELECTRICAL LAB
Laboratory experiments and assignments to supplement EE124

CHM129 CHEMISTRY LAB
Quantitative Analysis
Oxidation-Reduction Titrations: Estimation of percentage of iron using potassium dichromate by internal indicator method. Estimation of percentage of iron using potassium dichromate by external indicators.

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Iodometric titration of copper, sulphate by hypo-iodometric titration of potassium dichromate by hypo.

Water Analysis: Determination of alkalinity, hydroxyl, carbonate and bicarbonate in water. Determination of total hardness in water using soap or EDTA titrations. Determination of salinity of water sample by Mohr's method.

Lubricant Testing: Determination of viscosity of lubricating oil with change of temperature by Determination of Flash and Fire point of liquid fuel and lubricants

References
1. Practical Chemistry   S.S. Dara, S. Chand
2. Practical Engineering Chemistry   Mittal & Mittal

THIRD SEMESTER
MTH211 MATHEMATICS 3
Numerical Methods: Solution of algebraic and transcendental equations, Solution of linear Simultaneous Equations, Finite Differences, Interpolation and Extrapolation, Inverse Interpolation, Numerical Differentiation and Integration, Numerical solution of Ordinary & Partial Differential Equations.

Statistics: Curve fitting, Correlation and Regression Analysis Probability Distribution, Sampling and Testing of Hypothesis.

References
1. Numerical Analysis   Hildebrand, McGraw-Hill Book Company Inc
2. Numerical Analysis   Scarborough, John Hopkins University Press
3. Numerical Methods   E .Balaguruswamy, Tata McGraw-Hill Education
4. Numerical Methods
   for scientific and Engineering   M.K.Jain, New Age International Publishers

CE212 SURVEYING 1

Basic concepts, Principles and classifications of surveying, Linear measurements, Chain surveying. Measurement of Angles and Directions, Traversing and closing error adjustments. Plane table surveying,

Levelling, Contouring: methods, Characteristics, Uses of contour maps.

Angles and Directions with Theodolites: types of theodolites, Measurement of horizontal and vertical angles. Theodolite traversing, omitted measurements

Computation of area: Planimeter. Computation of volumes: Mass Haul diagram. Hydrographic Surveying: Basic concepts and method

References
1 Plane Surveying   A. M. Chandra., New Age International publishers

2 Surveying and Leveling-Part-I & II   T. P. Kanetkar and S. V. Kulkarni, Pune Vidar