

DELHI TECHNOLOGICAL UNIVERSITY

**SCHEME OF EXAMINATION
AND
COURSE OF READING
FOR**

**B.TECH
(FIRST YEAR)**

**Syllabus applicable to the students seeking admission to
B.TECH. (Common for all for branches) Course**

COURSE SCHEME OF EXAMINATION FOR B.TECH
FIRST SEMESTER

A Group: Electrical & Electronics Engg. (EEE), Engg. Physics (EP), Automobile Engg. (AE), Software Engg. (SWE), Electrical Engg. (EE), Mechanical Engg.(ME), Production & Industrial Engg.(PIE)

B Group: Civil Engg. (CE), Environmental Engg. (ENE), Electronics & Communication Engg. (ECE), Polymer Science & Chemical Technology (PCT), Biotechnology (BT), Information Technology (IT), Computer Engg. (COE)

GROUP A

S.No	Course No.	Subject	LTP	Evaluation		Total Marks	Credit Type
				Sess	End		
TH1	AM 101	Mathematics-I	3 1 0	30	70	100	4H
TH2	HU 102	Communication Skills	2 1 0	30	70	100	3H
TH3	AP 103	Applied Physics-I	3 1 0	30	70	100	4H
TH4	AC 104	Applied Chemistry	3 1 0	30	70	100	4H
TH5	EE 105	Electrical Sciences	3 1 0	30	70	100	4A
TH6	IT 106	Fundamentals of Information Technology	2 1 0	30	70	100	3A
PR1	AP 107	Applied Physics Lab	0 0 2	30	70	100	2H
PR2	AC 108	Applied Chemistry Lab	0 0 2	30	70	100	2H
PR3	EE 109	Electrical Sciences Lab	0 0 2	30	70	100	2A
PR4	IT 110	Information Technology Lab	0 0 2	30	70	100	2A
	TOTAL					1000	30

GROUP B

S.No.	Course No.	Subject	LTP	Evaluation		Total Marks	Credit Type
				Sess	End		
TH1	AM 101	Mathematics-I	3 1 0	30	70	100	4H
TH2	EN 112	Environmental Science	2 0 0	30	70	100	2A
TH3	AP 103	Applied Physics-I	3 1 0	30	70	100	4H
TH4	AP-AC 114	Engineering Materials	4 0 0	30	70	100	4H
TH5	ME 115	Basic Mechanical Engineering	4 0 0	30	70	100	4A
TH6	COE 116	Programming Fundamentals	2 0 0	30	70	100	2A
PR1	AP 107	Applied Physics Lab	0 0 2	30	70	100	2H
PR2	ME 117	Engineering Graphics	0 0 3	30	70	100	3A
PR3	COE 118	Programming Lab	0 0 2	30	70	100	2H
PR4	PIE 120	Mechanical Workshop	0 0 3	30	70	100	3A
	TOTAL					1000	30

NOTE: AP 114 (Part I): Applied Physics (2 hrs/ week)

AC 114 (Part II): Applied Chemistry (2 hrs/ week)

COURSE SCHEME OF EXAMINATION FOR B.TECH
SECOND SEMESTER

A Group: Electrical & Electronics Engg. (EEE), Engg. Physics (EP), Automobile Engg. (AE), Software Engg. (SWE), Electrical Engg. (EE), Mechanical Engg.(ME), Production & Industrial Engg.(PIE)

B Group: Civil Engg. (CE), Environmental Engg. (ENE), Electronics & Communication Engg. (ECE), Polymer Science & Chemical Technology (PCT), Biotechnology (BT), Information Technology (IT), Computer Engg. (COE)

GROUP A

S.No.	Course No.	Subject	LTP	Evaluation		Total Marks	Credit Type
				Sess	End		
TH1	AM 111	Mathematics-II	3 1 0	30	70	100	4H
TH2	EN 112	Environmental Science	2 0 0	30	70	100	2A
TH3	AP 113	Applied Physics-II	3 1 0	30	70	100	4H
TH4	AP-AC 114	Engineering Materials	4 0 0	30	70	100	4H
TH5	ME 115	Basic Mechanical Engineering	4 0 0	30	70	100	4A
TH6	COE 116	Programming Fundamentals	2 0 0	30	70	100	2A
PR1	ME 117	Engineering Graphics	0 0 3	30	70	100	3A
PR2	COE 118	Programming Lab	0 0 2	30	70	100	2H
PR3	AP 119	Applied Physics Lab-II	0 0 2	30	70	100	2H
PR4	PIE 120	Mechanical Workshop	0 0 3	30	70	100	3A
	TOTAL					1000	30

GROUP B

S.No.	Course No.	Subject	LTP	Evaluation		Total Marks	Credit Type
				Sess	End		
TH1	AM 111	Mathematics-II	3 1 0	30	70	100	4H
TH2	HU 102	Communication Skills	2 1 0	30	70	100	3H
TH3	AP 113	Applied Physics-II	3 1 0	30	70	100	4H
TH4	AC 104	Applied Chemistry	3 1 0	30	70	100	4H
TH5	EE 105	Electrical Sciences	3 1 0	30	70	100	4A
TH6	IT 106	Fundamentals of Information Technology	2 1 0	30	70	100	3A
PR1	AC 108	Applied Chemistry Lab	0 0 2	30	70	100	2H
PR2	EE 109	Electrical Sciences Lab	0 0 2	30	70	100	2A
PR3	AP 119	Applied Physics Lab-II	0 0 2	30	70	100	2H
PR4	IT 110	Information Technology Lab	0 0 2	30	70	100	2A
	TOTAL					1000	30

NOTE: AP 114 (Part I): Applied Physics (2 hrs/ week)

AC 114 (Part II): Applied Chemistry (2 hrs/ week)

DETAILED COURSE SCHEME FOR I SEMESTER
(COMMON FOR ALL BRANCHES)

AM-101 MATHEMATICS-I

L T P Credits
3 1 0 4

Total Hours: 40

UNIT I:

Infinite series: Tests for convergence of series (comparison, ratio, root, integral, Raabe's, logarithmic), Alternating series, Absolute convergence, Conditional convergence.

UNIT II:

Calculus of single variable: Taylor's & Maclaurin's expansion, Radius of curvature, applications of definite integral to area, arc length, surface area and volume (in Cartesian, parametric and polar co-ordinates).

UNIT III:

Calculus of several variables: Partial differentiation, Euler's theorem, total differential, Taylor's theorem, Maxima-Minima, Lagrange's method of multipliers, Application in estimation of error and approximation.

UNIT IV:

Multiple Integrals: Double integral (Cartesian and polar co-ordinates), change of order of integration, triple integrals (Cartesian, cylindrical and spherical co-ordinates), Gamma and Beta functions. Applications of multiple integration in area, volume, centre of mass, and moment of inertia.

UNIT V:

Vector Calculus: Continuity and differentiability of vector functions, Scalar and vector point function, Gradient, Directional Derivative, divergence, curl and their applications. Line integral, surface integral and volume integral, applications to work done by the force. Applications of Green's, Stoke's and Gauss divergence theorems.

TEXT BOOKS:

1. Kreyszig, "Advanced engineering mathematics", Wiley.
2. Taneja, "Advanced engineering mathematics", I K international.

REFERENCE BOOKS:

1. Alan Jeffery, "Advanced engineering mathematics", Academic Press.
2. Thomas, Finney, "Calculus and analytic geometry", Narosa.
3. Jain, Iyenger, "Advanced engineering mathematics", Narosa.

HU-102 COMMUNICATION SKILLS

L T P Credits
2 1 0 3

Total Hours: 30

UNIT I:

Functional Grammar & Usage-articles, prepositions, voice, narration, punctuation. Vocabulary building-word formation (by adding suffixes & prefixes) synonyms, antonyms, words often confused, foreign words & phrases, idioms.

UNIT II:

Technical writing- definitions, descriptions and explanations of objects, instruments, processes & scientific principles. Summarizing & abstracting, paragraph writing, speech & dialogue writing, comprehension (unseen) Business correspondence-Letters, memos, notices, circulars, CVs & SOPs.

UNIT III:

Phonetics- speech sounds, the phoneme, the syllable, IPA transcriptions. Presentation/seminar. Language Lab practice for oral & listening comprehension.

TEXT BOOKS:

1. S. J. McGrath, "Basic managerial skills for all", Prentice Hall of India New Delhi 2007.
2. Huthcinson, Tom and Alan Waters, "English for Specific Purposes. Cambridge university Press", Cambridge, 1987.

REFERENCE BOOKS:

1. Raman Meenakshi and Sharma Sangeeta, "Technical communication: Principles & practice", OUP New Delhi 2005.
2. Weiss, Edmond H. Writing Remedies, "Practical Exercises for Technical Writing", UP, 2000.
3. Hamp-Lyons, Liz and Ben Heasley, Study Writing, "A Course written in English for Academic and Professional Purposes", Cambridge University Press, Cambridge 1987.
4. Goatly, Andrew, "Critical Reading and Writing", London: Routledge, 2000.
5. Balasubramanian, T., "A Textbook of English Phonetics", MacMillan, 2007.

AP-103 APPLIED PHYSICS

L T P Credits
3 1 0 4

Total Hours: 40

UNIT I:

Relativity: Review of concepts of frames of reference and Galilean transformation equation, Michelson – Morley experiment and its implications, Einstein’s special theory of relativity, Lorentz transformation equations, Law of addition of velocities, Mass variation with velocity, Concept of energy and momentum, Mass energy relation.

UNIT II:

Oscillations, waves: Damped and forced oscillations, Resonance (amplitude and power), Q – factor, Sharpness of resonance, Equations of longitudinal and transverse waves and their solutions, Impedance, Reflection and transmission of waves at a boundary, Impedance matching between two medium.

UNIT III:

Physical optics: Interference by division of wave front and amplitude, Multiple beam interference and Fabry-Perot interferometer, Fresnel diffraction through a straight edge, Fraunhofer diffraction, Zone plate, single slit and N-slit / grating, Resolving power of telescope, prism and grating
Polarization by reflection and by transmission, Brewster’s law, Double refraction, elliptically and circularly polarized light, Nicol prism, Quarter and half wave plates.

UNIT IV:

Optical Instruments: Cardinal points of co-axial lens systems, spherical and chromatic aberrations and their removal, Huygens and Ramsden’s eyepiece.

UNIT V:

Laser optics: Coherence and coherent properties of laser beams, Brief working principle of lasers, Spontaneous and stimulated emission, Einstein’s co-efficient, Ruby laser, He-Ne laser.

Optical Fiber: Classification of optical fibers, Refractive index profile, Core cladding refractive index difference, Numerical aperture of optical fiber, Pulse dispersion in optical fiber (ray theory).

TEXT BOOKS:

1. H.J. Pain, “The Physics of vibrations and waves”, Wiley.
2. A.P. French, “Vibrations and waves”, the M.I.T. Introductory Physics Series.

REFERENCE BOOKS:

1. Authors Beiser, “Perspective of Modern Physics”, TMH.
2. A. Ghatak, “Optics”.

AC-104 APPLIED CHEMISTRY

L T P Credits
3 1 0 4

Total Hours: 40

UNIT I:

Conventional Analysis: Volumetric Analysis, Types of titrations, Theory of indicators.

Spectral Analysis: Electromagnetic radiation, Lambert-Beer's Law, UV-VIS, IR, instrumentation & applications.

UNIT II:

Thermal Methods of Analysis: principle, working and applications of Thermogravimetry, Differential thermal analysis and Differential scanning calorimetry.

UNIT III:

Polymers: Monomer & polymer, functionality and Degree of Polymerization. Mechanism of polymerization. Molecular weights of polymers. Methods of polymerization. Industrial production of PE and PF resins. Industrial applications of polymers.

Bio-molecules: Classification, Structure, physical and chemical properties of Amino-acids, Peptides and Proteins, Carbohydrates, Cellulose and its derivatives, RNA, DNA. Introduction to Bio-degradable Polymers

UNIT IV:

Electrochemistry: Electrochemical cells: components, characteristics of batteries. Primary and Secondary battery systems: Zinc-Carbon cells, Lead storage and lithium batteries. Fuel Cells, Electro-deposition: Electrical and chemical requirements. Electroplating bath and linings. Agitation, Circulation and filtration equipment. Plating of copper, gold and rhodium.

UNIT V:

Phase Equilibrium: Definitions of Phase, component and degree of freedom, Gibb's phase rule. One component systems: Water and sulphur. Two component systems: Pb-Ag and Cu-Ni system.

UNIT VI:

Green Chemistry: Introduction, Goals & Significance of Green Chemistry. Reagents, solvents and catalysts for green synthesis. Principles of Green Chemistry, Evaluation of feedstocks, reaction types and methods. Future trends in Green Chemistry.

TEXT BOOKS:

1. T. Hatakeyama, F.X. Quinn, "Thermal Analysis", Wiley.
2. A.I. Vogel, "Inorganic Quantitative analysis", Longmans Green, London, 1961.

REFERENCE BOOKS:

1. Skoog D.A., "Instrumental method of analysis", HRW International.
2. P.T. Anastas & JC Warner, "Green Chemistry: Theory & Practice", Oxford University Press.
3. Billmeyer, Polymer Science and Technology, John Wiley.
4. Fried, "Polymer Science and Technology", Prentice Hall.

EE-105 ELECTRICAL SCIENCES

L T P Credits
3 1 0 4

Total Hours: 40

UNIT I:

Introduction: Role and importance of circuits in Engineering, concept of fields, charge, current, voltage, energy and their interrelationship. V-I characteristics of ideal voltage and ideal current sources, various types of controlled sources. Passive circuit components: V-I characteristics and ratings of different types of R, L, C elements.

UNIT II:

DC Network: Series circuits and parallel circuits, power and energy, Kirchoff's Laws. Delta-star conversion, Superposition Theorem, Thevenin's Theorem, Norton's theorem, Maximum Power Transfer Theorem, Tellegen Theorem.

UNIT III:

Single Phase AC Circuits: Single phase EMF generation, average and effective values of sinusoids, complex representation of impedance, series and parallel circuits, concept of phasor, phasor diagram, power factor, power in complex notation, real power, reactive power and apparent power. Resonance in series and parallel circuits, Q-factor, bandwidth and their relationship, half power points.

UNIT IV:

Three-Phase AC Circuits: Three phase EMF generation, delta and Y connection, line and phase quantities. Solution of three phase circuits: balanced supply voltage and balanced load, phasor diagram, measurement of power in three phase circuits.

UNIT V:

Magnetic Circuits & Transformers: Amperes circuital law, B-H curve, concept of reluctance, flux, MMF, analogies between electrical and magnetic quantities solution of magnetic circuits. Hysteresis and eddy current losses, application of magnetic force, mutual inductance and dot convention. Single phase Transformer construction, principle of working, auto transformer and their applications.

UNIT VI:

Three Phase and Single Phase Induction Motor: Construction, Principle of operation, types of motors applications.

UNIT VII:

Measuring Instruments: Analog indicating instruments, devices, Damping devices, PMMC ammeters and voltmeters, shunt and multipliers, Moving iron ammeter and voltmeters, dynamometer type wattmeters, multimeters, AC watt-hour meters. Digital electronic voltmeters, digital electronic ammeters and wattmeters.

TEXT BOOKS:

1. C.L. Wadhwa, "Basic electrical Engineering", 4th Edition, New Age International.
2. Fitzerald, Higgenbotham & Gabel, "Basic Electrical Engineering", McGraw hill International.

REFRENCE BOOKS:

1. Vincent Deltoro, "Electrical Engineering Fundamentals", Prentice Hall International (EEI).
2. Relevant Indian Electricity Supply rules & BIS codes.

IT-106 FUNDAMENTALS TO INFORMATION TECHNOLOGY

L T P Credits
3 0 0 3

Total Hours: 30

UNIT I:

Fundamental Concept of Information: Definition of information, Data Vs Information, Introduction to Information representation in Digital Media, Text, image, graphics, Animation, Audio, Video etc., Need, Value and Quality of information.

Compression: Definition, Compression ratio, Compression Techniques.

UNIT II:

Concepts in Computer: Definition of Electronic Computer, Generations, Classification, Characteristics and Applications.

Computer Software: System Software and Application Software.

Computer Hardware: CPU, Memory, different types of memories, Various I/O devices. Firmware and Humanware.

UNIT III:

Programming Language Classification & Methodology: Introduction to Computer Languages, Generation of Languages, Flow Charts, Dataflow Diagram, Introduction to 4GL and 5GL.

Translators: Assemblers, Interpreters, Compilers.

UNIT-IV:

Digital Fundamentals: Number System, Decimal, Binary, Octal, Hexa-Decimal and their conversion, Introduction to various codes, Fixed and Floating number representations, Boolean Algebra, K-maps, Basic and Universal gates.

Combinational Circuits: adder, subtractor, encoder, decoder, MUX and DeMUX.

Sequential circuits: Definition, Flip Flops –SR, JK, Master-slave JK, T and D.

UNIT V:

Communication & Computer Networks: Introduction to Information Transmission Systems, Modulation, Need for Modulation, Analog Modulation- AM-Equation Of AM, modulation index, power calculations, AM generation(block diagram) and demodulation, Introduction to FM and PM , Comparison of AM techniques , PCM, LAN, MAN and WAN, Network Topologies, Client-server Architecture.

UNIT VI:

Internet and Web Technologies: Internet, Intranet and Extranet, Hypertext Markup Language, Static, active and dynamic web pages, WWW, HTTP, HTTPs, Gopher, FTP, Telnet, Web Browsers, Search Engines, Email, Digital Signatures, Firewall, Elementary Concepts of E-Commerce, Electronic Payment Systems.

TEXT BOOKS:

1. Peter Norton, "Introduction to Computers", Tata McGraw-Hill VI Edition.
2. Rajaraman, "Introduction to Computers", PHI.

REFERENCE BOOKS:

1. Morris Mano, "Digital Design", PHI, 2nd Ed, 2002.
2. Floyd, "Digital Fundamentals, Pearson, 10th Edition.
3. Kennedy, "Communication Systems", 4th Edition.
4. Nelson, "Data Compression", BPB
5. CIS Tems, "Internet, An introduction" Tata McGraw Hill.
6. Leon & Leon "Fundamentals of Information Technology", Vikas.

EN-112 ENVIRONMENTAL SCIENCE

L T P Credits
2 0 0 2

Total Hours: 20

UNIT I:

Introduction to Environment: Origin & evolution of earth, segments of environment- lithosphere, hydrosphere, atmosphere & biosphere, Biogeochemical cycles-geologic, hydrological, oxygen, nitrogen, carbon & phosphate cycles.

UNIT II:

Ecosystems: Concept of ecosystem biotic & abiotic components, types of ecosystems, functional components of ecosystem- biodiversity, productivity, food chains & food webs, material cycling and energy flow, different ecosystems- forest, grassland, desert, aquatic.

UNIT III:

Water Pollution: Water quality, physical, chemical & biological characteristics of water & waste water, ground water pollution, water borne diseases.

UNIT IV:

Air & Noise Pollution: Primary & secondary air pollutants, sources, effects & control of- carbon monoxide, nitrogen oxides, hydrocarbons, sulphur dioxide & particulates, Air quality standards, global warming, acid rain, El Nino, ozone hole. Classification and measurement of noise, effects of noise pollution on human, control of noise pollution.

UNIT V:

Energy & Solid Waste Management: Conventional energy resources- coal, thermal, petroleum, hydroelectricity, nuclear power, wood, non conventional sources- solar, biogas, wind, ocean & tidal energy, geothermal energy. Hazardous and non hazardous solid waste management. Environmental laws and acts.

TEXT BOOKS:

1. Rana. S.V.S., "Essentials of Ecology & Environment Science", PHI Publications.
2. Basak Anindita, "Environmental Studies", Pearson Education South Asia.

REFERENCE BOOKS:

1. Subramanian. V, "A Text Book of Environmental Science", Narosa Publishing House.
2. De Anil Kumar & De Arnab Kumar, "Environmental Studies", New Age International (P) Ltd.

AP-AC 114 ENGINEERING MATERIALS

L T P Credits
4 0 0 4

Total Hours: 40

PART – A (PHYSICS)

UNIT I:

Crystal Structure: Bravais lattices; Miller indices, simple crystal structures, Different kind of bending.

Metallic Conduction: Energy distribution of electrons in a metal, Fermi level, Conduction process.

Semi Conductors: Band theory of solids , P and N type of semiconductors , Statistics of holes and electrons , Hall effect , Effect of temperature on conductivity , Life time and recombination , drift and diffusion in PN junction .

UNIT II:

Dielectric and Optical properties of Materials: Dielectric polarization and dielectric constant, optical absorption process.

Magnetism and Superconducting Materials: Dia-para , Ferro-magnetism , Antiferro , Ferro-magnetism ferrites, Superconducting materials , Properties , Type of superconducting materials , Meissner effect , High- T_c superconductor , application.

PART – B (CHEMISTRY)

UNIT III:

Water treatment: Impurities in water, hardness of water, determination and removal of hardness, boiler feed water, boiler troubles and prevention, numerical based on hardness removal.

Composite materials: Introduction, limitations of conventional engineering materials, role of matrix in composites, classification, matrix materials, reinforcements, metal-matrix composites, polymer-matrix composites, fiber-reinforced composites, environmental effects on composites, applications of composites.

UNIT IV:

Speciality Polymers: Conducting polymers-Introduction, conduction mechanism, polyacetylene, polyparaphenylene and polypyrrole, applications of conducting polymers, Ion-exchange resins and their applications.

Ceramic & Refractory: Introduction, classification, properties, raw materials, manufacturing and applications.

TEXT BOOKS:

1. Kittel, "Solid State Physics", 7th edition J. W. & Sons Publication.
2. Donald R. Askeland, Pradeep P. Phule, "Essentials of Material Science and Engineering", Thomson.

REFERENCE BOOKS:

1. Wahab M.A., "Solid State Physics", Narosa Publishing House.
2. Ali OmerM, "Solid State Physics", Pearson Education (Singapore) pvt. Ltd. India branch, New delhi.
3. Kenneth G. Budinski, Budinshi, "Engineering Materials: Properties and Selection", 7th edition, Pearson Singapor (Prentice Hall).
4. Pillai S.O., "Solid State Physics", New Age International Publication.
5. R.W.Dyson, "Speciality Polymers", Chapman and Hall, New York.
6. A.P.Gupta, M.C.Gupta, "Polymer Composites", New Age publication.
7. R.N.Goyal, H.Goel, "Engineering Chemistry", Ane Books India.
8. by S.S.Dara, "Engineering Chemistry", S.Chand.
9. Raghupati Mukhopadhyay, Sriparna Datta, "Engineering Chemistry", New Age International.
10. P.C.Jain, Monica Jain, "Engineering Chemistry" Dhanpat Rai.

ME-115 BASIC MECHANICAL ENGINEERING

L T P Credits
4 0 0 4

Total Hours: 40

PART A

UNIT I:

Introduction to Thermodynamics, Concepts of systems, control volume, state, properties, equilibrium, quasi-static process, reversible & irreversible process, cyclic process. Zeroth Law and Temperature, Ideal Gas. Heat and Work.

UNIT II:

First Law of Thermodynamics for closed & open systems. Non Flow Energy Equation. Steady State, Steady Flow Energy Equation.

Second Law of Thermodynamics-Kelvin and Plank's Statements, Clausius inequality, Definition of Heat Engines, Heat pumps, Refrigerators. Concept of Energy and availability. Carnot Cycle; Carnot efficiency, Otto, Diesel, Dual cycle and their efficiencies.

UNIT III:

Properties & Classification of Fluids, Ideal & real fluids, Newton's law of viscosity, Pressure at a point, Pascal's law, Pressure variation in a static fluid, Introduction to Bio-fluid Mechanics General description of fluid motion, stream lines, continuity equation, Bernoulli's equation, Steady and unsteady flow. Turbines and pumps.

PART B

UNIT IV:

Introduction to engineering materials for mechanical construction. Composition, mechanical and fabricating characteristics and applications of various types of cast irons, plain carbon and alloy steels, copper, aluminum and their alloys like duralumin, brasses and bronzes cutting tool materials, super alloys thermoplastics, thermosets and composite materials.

UNIT V:

Introduction to Manufacturing processes for various machine elements. Introduction to Casting & Welding processes. Fabrication of large & small components and assemblies- example Nuts and Bolts, Water turbine rotors, Large Electric Generators, introduction to turning milling, shaping, drilling & boring processes.

UNIT VI:

Introduction to quality measurement for manufacturing processes; standards of measurements, line standards and, end standards, precision measuring instruments and gauges: vernier calipers, height gauges, micrometers, comparators, dial indicators, and limit gauges.

TEXT BOOKS:

1. P. K. Nag, "Engineering Thermodynamics"
2. G. J. Van Wyle and R. E. Santag, "Fundamentals of Classical Thermodynamics".

REFERENCE BOOKS:

1. S. K. Som and G. Biswas, "Introduction to Fluid Mechanics and Fluid Machines"
2. R. K. Bansal, "Fluid Mechanics and Hydraulic Machines".
3. Kalpakjian "Manufacturing Processes".
4. K. Hazara Chowdhary, "Workshop Practices".
5. W. A. J. Chapman "Workshop Technology".
6. R. K. Jain, "Production Engineering".

COE-116 PROGRAMMING FUNDAMENTALS

L T P Credits
2 0 0 2

Total Hours: 20

UNIT I:

Introduction: Concepts of algorithm, flow chart, Introduction to different Programming Languages like C, C++, Java etc.

Elementary Programming: Data types, assignment statements, conditional statements and input/output statements. Iterative programs using loops. Concept of subprograms. Coding style: choice of names, indentation, documentation, etc.

UNIT II:

Arrays: Array representation, Operations on array elements, using arrays, multidimensional arrays.

Structures & Unions: Declaration and usage of structures and Unions.

Pointers: Pointer and address arithmetic, pointer operations and declarations, using pointers as function argument,

File: Declaration of files, different types of files. File input/output and usage.

UNIT III:

Object Oriented Programming: Functional and data decomposition, Characteristics of Object-Oriented Languages: Abstraction, Encapsulation, Information hiding, abstract data types,

Classes and Objects: Concept of Object & classes, attributes, methods, C++ class declaration, private and public memberships, Constructors and destructors, instantiation of objects. Introduction to Class inheritance and operator overloading.

UNIT IV:

Files: Streams and files, error handling, over view of Standard Template Library.

TEXT BOOKS:

1. Jeri R. Hanly, Elliot B. Koffman, "Problem Solving and Program Design in C", Pearson Addison-Wesley, 2006.
2. Schildt Herbert, "C++: The Complete Reference" Wiley DreamTech, 2005.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, Richard F. Gilberg, "A Structured Programming Approach Using C", Thomson Computer Science-Third Edition, 2007.
2. E. Balagurusamy, "Object Oriented Programming using C++", TMH. R. Lafore; BPB Publications, 2004.
3. D. Parsons, "Object Oriented Programming with C++", BPB Publication, 1999.
4. "The Art of Programming Computer Science with C++" Steven C. Lawlor; Vikas Publication, 2002.

AM-111 MATHEMATICS-II

L T P Credits
3 1 0 4

Total Hours: 40

UNIT I:

Matrices: Rank of a matrix, inverse of a matrix using elementary transformations, consistency of linear system of equations; Eigen-values and eigenvectors of a matrix, Cayley Hamilton theorem, diagonalization of matrix. Applications of matrices to electrical network.

UNIT II:

Ordinary differential equations: Second & higher order linear differential equations with constant coefficients, General solution of homogenous and non- homogenous equations, method of variation of parameters, Euler-Cauchy equation, simultaneous linear equations, Applications to simple harmonic motion, and mass-spring system.

UNIT III:

Special Functions: Power series method, Frobenious method, Legendre equation, Legendre polynomials, Bessel equation, Bessel function of first kind. Orthogonal property.

UNIT IV:

Laplace Transforms: Basic properties, Laplace transform of derivatives and integrals, Inverse Laplace transform, Differentiation and Integration of Laplace transform, Convolution theorem, Unit step function, Periodic function. Applications of Laplace transform to initial and boundary value problems.

UNIT V:

Fourier series and Transforms: Fourier series, Even and odd functions, half range series, Applications of Fourier series in frequency spectrum of a periodic pulse. Harmonic analysis, Fourier Transforms, Transforms of derivatives and integrals, Applications to boundary value problem in ordinary differential equations (simple cases only).

TEXT BOOKS:

1. Kreyszig, "Advanced engineering mathematics", Wiley.
2. Taneja, "Advanced engineering mathematics", I K international.

REFERENCE BOOKS:

1. Alan Jeffery, "Advanced engineering mathematics", Academic Press
2. Thomas, Finney, "Calculus and analytic geometry", Narosa.
3. Jain, Iyenger, "Advanced engineering mathematics", Narosa.

AP-113 APPLIED PHYSICS-II

L T P Credits
3 1 0 4

Total Hours: 40

UNIT I:

Quantum Physics: Failure of classical physics ,Compton effect , Pair production de-broglie relation, wave function, Probability density, Schrodinger wave equation operators, expectation values and eigen value equation, particle in a box, simple harmonic oscillator problem, concept of degeneracy.

UNIT II:

Classical Statistic: Statistical physics-Microscopic macroscopic systems, concept of phase space basic postulates of statistical mechanics, Maxwell—Boltzmann distribution law.

UNIT III:

Quantum statistic: Fermi—Dirac and Bose –Einstein Distribution, Fermi- Dirac probability function, Fermi energy level.

UNIT IV:

Nuclear Physics: Nuclear properties, constituent of the nucleus, binding energy, stable nuclei, radioactive decay law (alpha and beta spectrum), Q-value of nuclear reaction , nuclear models-liquid drop and shell model, nuclear fission and fusion, elementary ideas of nuclear reactors.

UNIT V:

Electrodynamics: Maxwell's equations, concept of displacement current, Derivation of wave equation for plane electromagnetic wave, Pointing vector. Pointing theorem, Energy density, wave equation in dielectric & conducting media.

TEXT BOOKS:

1. Erwin Kaplan, "Nuclear Physics".
2. Arthur Beiser, "Perspective of Modern Physics".

REFERENCE BOOKS:

1. Griffith, "Electrodynamics".
2. Rangawala & Mahajan, "Electricity & magnetism".

GROUP A

B.Tech.I year, I Semester Examination

Practical Paper I

AP-107 APPLIED PHYSICS LAB

L	T	P	Credits
0	0	2	2

Based on course work corresponding AP-103

Practical Paper II

AC-108 APPLIED CHEMISTRY LAB

L	T	P	Credits
0	0	2	2

Based on course work corresponding AC-104

Practical Paper III

EE-109 ELECTRICAL SCIENCES LAB

L	T	P	Credits
0	0	2	2

Based on course work corresponding EE-105

Practical Paper IV

IT-110 INFORMATION TECHNOLOGY LAB

L	T	P	Credits
0	0	2	2

Based on course work corresponding IT-106

GROUP B

B.Tech.I year, I Semester Examination

Practical Paper II

ME-117 ENGINEERING GRAPHICS

L T P Credits
0 0 3 3

UNIT I:

General: Importance, Significance and scope of engineering drawing Lettering, Dimensioning, Scales, Sense of Proportioning, Different types of Projections, B.I.S. Specification, line symbols, rules of printing.

UNIT II:

Projections of Points and Lines: Introduction of planes of projection, Reference and auxiliary planes, projections of points and lines in different quadrants, traces, inclinations, and true lengths of the lines, projections on auxiliary planes, shortest distance, intersecting and non-intersecting lines.

UNIT III:

Planes Other than the Reference Planes: Introduction of other planes (perpendicular and oblique), their traces, inclinations etc., projections of points lines in the planes, conversion of oblique plane into auxiliary plane and solution of related problems.

UNIT IV:

Projections of Plane Figures: Different cases of plane figure (of different shapes) making different angles with one or both reference planes and lines lying in the plane figures making different given angles (with one or both reference planes). Obtaining true shape of the plane figure by projection.

UNIT V:

Projection of Solids: Simple cases when solid is placed in different positions, Axis, faces and lines lying in the faces of the solid making given angles.

UNIT VI:

Isometric and Orthographic: First and Third angle of system of projection sketching of Orthographic views from pictorial views and vice –versa principles and type of sectioning.

Development of Surface

TEXT BOOKS:

1. Narayana, K.L. and Kanniah, P.,“Engineering Graphics”, Tata McGraw Hill.

REFERENCE BOOKS:

1. Lakshminarayanan, V. and Vaish Wanar, R.S.,“Engineering Graphics” Jain Brothers.
2. Chandra, A.M. and Chandra Satish, “Engineering Graphics”, Narosa.

GROUP B

B.Tech.I year, I Semester Examination

Practical Paper I

COE-118 PROGRAMMING LAB

L	T	P	Credits
0	0	2	2

Laboratory Practical Based on course work corresponding COE-116

Practical Paper III

AP-107 APPLIED PHYSICS LAB

L	T	P	Credits
0	0	2	2

Laboratory Practical Based on course work corresponding AP-103

Practical Paper IV

PIE-120 MECHANICAL WORKSHOP

L	T	P	Credits
0	0	3	3

Fitting shops: Introduction to various fitting tools- fabrication methods & job work assigned by workshop superintendent.

Welding shops: Introduction to welding shop-welding principles & classifications, arc welding processes & related tools/equipments.

Foundry Shops: Introduction to molding sands, molding tools-pattern making, miscellaneous work.

GROUP A

B.Tech.I year, II Semester Examination

Practical Paper I

ME-117 ENGINEERING GRAPHICS

L	T	P	Credits
0	0	3	3

See Group B: I semester practical paper II

Practical Paper II

COE-118 PROGRAMMING LAB

L	T	P	Credits
0	0	2	2

Laboratory Practical Based on course work corresponding COE-116

Practical Paper III

AP-119 APPLIED PHYSICS LAB-II

L	T	P	Credits
0	0	2	2

Laboratory Practical Based on course work corresponding AP-113

Practical Paper IV

PIE-120 MECHANICAL WORKSHOP

L	T	P	Credits
0	0	3	3

Fitting shops: Introduction to various fitting tools- fabrication methods & job work assigned by workshop superintendent.

Welding shops: Introduction to welding shop-welding principles & classifications, arc welding processes & related tools/equipments.

Foundry Shops: Introduction to molding sands, molding tools-pattern making, miscellaneous work.

GROUP B

B.Tech.I year, II Semester Examination

Practical Paper I

AC-108 APPLIED CHEMISTRY LAB

L	T	P	Credits
0	0	2	2

Based on course work corresponding AC-104

Practical Paper II

EE-109 ELECTRICAL SCIENCES LAB

L	T	P	Credits
0	0	2	2

Based on course work corresponding EE-105

Practical Paper III

AP-119 APPLIED PHYSICS LAB-II

L	T	P	Credits
0	0	2	2

Based on course work corresponding AP-113

Practical Paper IV

IT-110 INFORMATION TECHNOLOGY LAB

L	T	P	Credits
0	0	2	2

Based on course work corresponding IT-106