

**B.TECH DEGREE COURSE IN
SAFETY & FIRE ENGINEERING**

(2006 Admissions)

**SCHEME OF EXAMINATIONS AND
SYLLABUS**

B.TECH DEGREE COURSE IN SAFETY & FIRE ENGINEERING

Scheme of Examinations (2006 admissions)

SEMESTER I&II (Common to all branches)

Code No.	Subject	Hrs/week		Int	Univ	Total
		L	T/D/P			
CE/CS/EB/EC/EE/ EI/IT/ME/SE 101	Engineering Mathematics –I	3		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 102	Engineering Physics	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 103	Engineering Chemistry	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 104	Engineering Mechanics	3	1	50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 105	Engineering Graphics	1	3	50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 106	Basic Civil and Mechanical Engineering	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 107	Basic Electrical Engineering and Electronics	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 108	Computer Programming	2		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 109	Technical Communication and Social Sciences	3*		50	100	150
CE/CS/EB/EC/EE/ EI/IT/ME/SE 110	Computer Programming Laboratory	-	3	100	-	100
CE/CS/EB/EC/EE/ EI/IT/ME/SE 111	Electrical and Mechanical Workshop	-	3	100	-	100
	TOTAL	20	10	650	900	1550

* 1 hour / week for Environmental Studies.

SEMESTER III

Code No.	Subject	Hrs / week		Int.	Univ	Total
		L	T/D/P			
CE/CS/EB/EC/EE/ EI/IT/ME/SE 301	Engg. Mathematics –II	4	-	50	100	150
SE 302	Chemical Engineering I	4	-	50	100	150
SE 303	Fluid Mechanics and Fluid Flow Machines	4	-	50	100	150
SE 304	Manufacturing Processes	4	-	50	100	150
SE 305	Elements of Machine Drawing	1	3	50	100	150
SE 306	Principles of Safety Management	4	-	50	100	150
SE 307	Machine Shop	-	3	100	-	100
SE 308	Fluid Mechanics & Machinery Lab	-	3	100	-	100
	TOTAL	21	9	500	600	1100

SEMESTER IV

Code No.	Subject	Hrs/ week		Int.	Univ	Total
		L	T/D/P			
CE/CS/EB/EC/EE/ EI/IT/ME/SE 401	Engg. Mathematics –III	4	-	50	100	150
SE 402	Chemical Engineering II	4	-	50	100	150
SE 403	Strength of Materials	4	-	50	100	150
SE 404	Fire Engineering I	4	-	50	100	150
SE 405	Electrical Technology and Safety in Electrical Systems	4	-	50	100	150
SE 406	First Aid and Emergency Procedures	4	-	50	100	150
SE 407	Strength of Materials Lab	-	3	100	-	100
SE 408	Electrical Technology Lab	-	3	100	-	100
	TOTAL	24	6	500	600	1100

SEMESTER V

Code No.	Subject	Hrs / week		Int	Univ	Total
		L	T/D/P			
CE/CS/EB/EC/EE/EI/IT/ME/SE 501	Engg. Mathematics IV	4	-	50	100	150
SE 502	Chemical Engineering III	4	-	50	100	150
SE 503	Principles of Engineering Design	4	-	50	100	150
SE 504	Fire Engineering II	4	-	50	100	150
SE 505	Principles of Industrial Management	4	-	50	100	150
SE 506	Safety in Construction	4	-	50	100	150
SE 507	Safety Engineering Lab	-	3	100	-	100
SE 508	Chemical Engineering Lab	-	3	100	-	100
	TOTAL	24	6	500	600	1100

SEMESTER VI

Code No.	Subject	Hrs / week		Int	Univ	Total
		L	T/D/P			
SE 601	Legal Aspects of Safety, Health and Environment	4	-	50	100	150
SE 602	Chemical Process Safety	4	-	50	100	150
SE 603	Process Instrumentation and Control Engineering	4	-	50	100	150
SE 604	Fire Engineering III	4	-	50	100	150
SE 605	Environmental Engineering and Management	4	-	50	100	150
SE 606	Occupational Health & Hygiene Management	4	-	50	100	150
SE 607	Environmental Engineering & Management Lab	-	3	100	-	100
SE 608	Minor Project	-	3	100	-	100
	TOTAL	24	6	500	600	1100

SEMESTER VII

Code No.	Subject	Hrs / week		Int	Univ	Total
		L	T/D/P			
SE 701	Hazard Identification and Risk Assessment	4	-	50	100	150
SE 702	Safety in Rail and Road Transport	4	-	50	100	150
SE 703	Safety in Engineering Industry	4	-	50	100	150
SE 704	Fire Engineering IV	4	1	50	100	150
SE 705	Elective I	4	-	50	100	150
SE 706	Fire Engineering Lab	-	3	100	-	100
SE 707	Industrial Hygiene lab	-	3	100	-	100
SE 708	Seminar	-	3	100	-	100
	TOTAL	20	10	550	500	1050

SE 705 ELECTIVE –I

- (A) Automobile Engineering and Safety
- (B) Safety in Petroleum and Petrochemical Industries
- (C) Food and Biosafety
- (D) Fault Detection and Diagnosis

SEMESTER VIII

Code No.	Subject	Hrs / week		Int	Univ	Total
		L	T/D/P			
SE 801	Human Factors Engineering	4	1	50	100	150
SE 802	Disaster Management	5	-	50	100	150
SE 803	Advanced Safety Engineering and Management	5	-	50	100	150
SE 804	Elective –II	5	-	50	100	150
SE 805	Project	-	10	300	-	300
SE 806	Viva Voce	-	-	-	100	100
	TOTAL	19	11	500	500	1000
	GRAND TOTAL			3700	4300	8000

SE 804 ELECTIVE -II

- (A) Safety in Power Plants
- (B) Safety in Health-Care Waste Management
- (C) Fluid Power Safety
- (D) Total Quality Management

CE/CS/EB/EC/EE/EI/IT/ME/SE 101 ENGINEERING MATHEMATICS I

MODULE I

Ordinary differential equations:

First order differential equations-Methods of solution and Simple applications
Linear differential equations of higher orders with constant co-efficients-Methods of solution of these equations. Cauchy's Linear differential equations. Simultaneous linear differential equations- Simple applications of linear differential equations in engineering problems - Electrical Circuits, Mechanical Systems

MODULE II

Infinite series: Integral test, comparison test, ratio test, Cauchy's root test, Raabe's test, series of positive and negative terms, concept of absolute convergence, alternating series, Leibniz test(No proofs for any of the above tests) Power series: Interval of convergence of power series, Taylor and Maclaurin series of functions.
Leibniz formula for the nth derivative of the product of two functions (No proof),use of Leibniz formula for the determination of co-efficients of the power series.

MODULE III

Partial differentiation: Partial differentiation-Concept of partial derivative - Chain rule- Total derivative- Euler's theorem for homogeneous functions, Differentials and their applications in errors and approximations, Jacobians - Maxima minima of functions of two variables(Proof of the result not required)-Simple applications.

Taylor's series expansion for a function on two variables-Simple problems

Co-ordinate systems:Rectangular co-ordinates-Polar co-ordinates-In plane and in Space
Cylindrical polar co-ordinates-Spherical polar co-ordinates.

MODULE IV

Integral calculus:

Application of definite integrals: Area, Volume, Arc length, Surface area.

Improper Integrals-Beta function-Gamma function Multiple integrals: Evaluation of double integrals-Change of order of integration. Evaluation of triple integrals-Change of Variables in integrals.

Applications of multiple integrals Plane Area, Surface area & Volumes of solids

References

- 1.Mathematical Techniques: Oxford University Press
- 2.Engineering Mathematics: T.Veerarajan, TMGH Publishers
- 3.Higher Engineering Mathematics: B.S.Grewal, Khanna Publishers
- 4.Engineering mathematics -Vol1:S.S.Sastry, PHI publishers Advanced Engineering Mathematics: Erwin Kreyzig, Wiley Eastern

Type of Questions for University Exam.

Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules.

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A & B.

CE/CS/EB/EC/EE/EI/ME/IT/SE 102: ENGINEERING PHYSICS

Module I:

Interference of light - Michelson interferometer - Applications-Interference in thin films Antireflection coatings - Interference filters - Fringes produced by air wedge - Testing of flat surfaces- Diffraction of light -Zone plate - Plane diffraction grating - Reflection and transmission gratings - Determination of wavelength of light - Dispersive and resolving powers - Polarization of light - Double refraction - Nicol's prism - Quarter and half wave plates - Elliptically and circularly polarized light - Optical activity - Specific rotation - Half-shade polarimeter Applications of polarized light.

Module II:

Lasers and Holography - Properties of laser light - Coherence of light - Principles of laser action - Population inversion - Optical pumping - Metastable states - Conditions for laser action Types of lasers - Helium-Neon, Ruby and Semiconductor lasers - Applications of lasers Principles of holography - Recording and Reconstruction of holograms - Applications of holography- Fiber optics - Light transmission through optical fiber - Numerical aperture - Multi and single mode fibers - Step index and graded index fibers - Fiber drawing - Fiber optic communication (basic ideas) - Ultrasonics - Generation of ultrasonic waves - Applications of Ultrasound.

Module III:

Quantum mechanics - Heisenberg's uncertainty principle - Experimental illustrations - Quantum mechanical wave equation - Time independent Schrodinger equation - Physical significance of wave function - Properties of the wave function - Solution of Schrodinger equation - Atomic and nuclear physics - The Vector atom model- Quantization of orbital angular momentum - Electron spin - Magnetic moment of orbital electron - Pauli's exclusion principle- Zeeman effect - Stark effect - Raman effect. Nuclear physics - Nuclear forces - Properties of the nucleus - Nuclear reactions-Nuclear reaction cross section-Artificial radioactivity - Nuclear reactors - Nuclear fusion - Thermonuclear reactions-Controlled thermonuclear reactions.

Module IV :

X-rays - Production of X-rays - Origin of X-rays and X-ray spectra - Moseley's law - Properties of X-rays - Applications of X-rays - Diffraction of X-rays by crystals - Bragg's law Crystallography - Unit cell - Seven crystal systems - Bravais space lattices - Packing factor Lattice planes and Miller indices - Energy bands in solids - Conductors, semiconductors and insulators - Intrinsic and extrinsic semiconductors - Conductivity of semiconductors - Fermi level - Applications of semiconductors - p-n junctions - solar cells - Hall effect and its applications - Superconductivity - Superconducting transition - The Meissner effect - Type I and Type n superconductors - Isotope effect - High temperature superconductors - Josephson effect - SQUIDS - Applications of superconductors

References

1. Jacob Philip - A text book of Engineering Physics, Educational Publishers and Distributors 2002
2. A.S. Vasudeva - Modern Engineering Physics, S. Chand & Co.
3. M.R. Sreenivasan - Physics for Engineers - New Age International

Type of Questions for University Exam.

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CE/CS/EB/EC/EE/EI/ME/IT/SE 103 ENGINEERING CHEMISTRY

Module I

Solid state chemistry: Fundamentals, Bonding in solids, Born-Haber cycle, Point defects, Methods to improve reactivity of solids, Free electron theory, Band theory, Fermi level in semiconductors, Molecular field theory of magnetic materials, Conventional and organic superconductors, High temperature superconductors, Liquid crystals, Applications. Solid surface characterisation: Electron spectroscopy for chemical analysis, Chemical shift, BET isotherm, Thermodynamics of adsorption.

Module II

Electrochemistry: Fundamentals, Electrode potentials, Types of electrodes, Salt bridge, emf measurement. Concentration cells, Acids and bases, Buffer solutions, pH measurements, Polarisation, Overvoltage. Power generation: Secondary cells, Fuel cells, Photovoltaic effect, Solar cells. Corrosion: Different forms of corrosion, Prevention of corrosion.

Chemical Kinetics: reaction rate, rate constant, rate law, reaction order, first order, second order, pseudo-first order reactions, integrated rate laws, half-life of a reaction and its relation to rate constant. Molecularity, simple unimolecular and bimolecular reactions. Arrhenius equation.

Fast reactions - flash photolysis, flow techniques and relaxation methods.

Module III Chemical Thermodynamics: Fundamentals, Molecular interpretation of internal energy, enthalpy and entropy, Heat of reaction, Kirchhoff's equation, Trouton's rule, Entropy changes accompanying different processes, Nernst heat theorem, Third-law. Free energy: Dependence on pressure and temperature, Gibbs-Helmholtz equation, Free energy changes and equilibrium constant, Chemical potential, Fugacity, Thermodynamics of biochemical reactions.

Module IV Engineering materials: Industrial polymers-polymerization techniques, structure-property relationships, polymer additives, polymer processing methods (extrusion, injection, compression, transfer and blow molding methods). Nanomaterials: definition, classification and applications.

Nanometals and nanoceramics - examples and properties.

Lubricants: classification, functions and properties. Mechanism of lubrication.

Refractories: classification and properties. Portland cement, lime and plaster of Paris manufacture, setting and hardening.

Chemistry of optical fibres, fullerenes and organoelectronic materials (introduction only).

Text Books

1. Peter Atkins and Julio de Paula Elements of Physical Chemistry, Oxford University Press, 2005
2. Shashi Chawla A Text Book of Engineering Chemistry (3rd edn.); Dhanpat Rai & Co, New Delhi, 2003.

References

1. Atkins, P.W., Physical Chemistry, Oxford University Press, UK, 1998
2. Bhatnagar, M. S., Textbook of Pure & Applied Physical Chemistry, A. H. Wheeler & Co, New Delhi, 1999.
3. Geoffrey Ozin, Andre Arsenault Nanochemistry: A Chemical Approach to Nanomaterials.; Royal Society of Chemistry, U.K. 2005.

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Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A & B.

CE/ME/EC/CS/SE/IT/EB/EI/EE 104 ENGINEERING MECHANICS

A) STATICS

MODULE I

Concurrent forces in a plane: Principles of statics. Composition and resolution of forces. Equilibrium of concurrent forces in a plane. Method of projection. Method of moments. Friction.

Parallel forces in a plane: Two parallel forces. General case of parallel forces in a plane. Centre of parallel forces and centre of gravity, Pappus theorems, centroids of composite plane figures and curves. Distributed forces in a plane.

MODULE II

Properties of areas: . Moment of inertia of a plane figure with respect to an axis in its plane. Polar moment of inertia. Product of inertia. Principal axes. Mass moment of inertia of material bodies.

General case of forces in a plane: Composition of forces in a plane. Equilibrium of forces in a plane. Plane trusses - Method of joints. Method of sections. Plane frames : Method of members. **Principle of virtual work:** Equilibrium of ideal systems, stable and unstable equilibrium.

B) DYNAMICS

MODULE III

Rectilinear translation: Kinematics of rectilinear motion. Differential equation of rectilinear motion. Motion of a particle acted upon by a constant force, by a force as a function of time and by a force proportional to displacement. Simple harmonic motion. D'Alembert's principle. Momentum and impulse. Work and energy, ideal systems, conservation of energy. Impact.

MODULE IV

Curvilinear translation: Kinematics of curvilinear translation. Differential equations of motion. Motion of a projectile. D'Alembert's principle in curvilinear motion. Moment of momentum. Work and energy in curvilinear motion.

Rotation of a rigid body: Kinematics of rotation. Equation of motion of a rigid body rotating about a fixed axis. Rotation under the action of a constant moment. Compound pendulum. General case of moment proportional to the angle of rotation. D'Alembert's principle of rotation. Resultant inertia force in rotation. Principle of angular momentum in rotation. Energy equation for rotating bodies.

REFERENCES

1. Engineering Mechanics - Timoshenko and Young - McGraw Hill Book Company.
2. Mechanics for Engineers (Vol. 1- Statics and Vol.2 -Dynamics) - Beer F. P. & Johnston E. R. - Tata McGraw Hill.
3. Engineering Mechanics (Vol. 1- Statics and Vol.2 -Dynamics) - Merriam H. L. & Kraige L. G. - John Wiley and Sons.
3. Engineering mechanics- Biju N-Educational Publications –

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CE/ME/EC/CS/SE/IT/EB/EI/EE 105 ENGINEERING GRAPHICS

MODULE I

Introduction to engineering graphics. Drawing instruments and their use. familiarisation with current Indian Standard Code of Practice for general engineering drawing.

Scales- plain scale ,vernier scale, diagonal scale.

Conic sections- Construction of ellipse, parabola, hyperbola - construction of cycloid, involute, archimedian spiral and logarithmic spiral- drawing tangents and normals to these curves.

MODULE II

Introduction to orthographic projections- plane of projection- principles of first angle and third angle projections, projection of points in different quadrants.

Orthographic projection of straight lines parallel to one plane and inclined to the other plane- straight lines inclined to both the planes- true length and inclination of lines with reference planes- traces of lines.

Projection of plane laminae of geometrical shapes in oblique positions.

MODULE III

Projection of polyhedra and solids of revolution- frustum, projection of solids with axis parallel to one plane and parallel or perpendicular to other plane- projection of solids with axis inclined to both the planes- projection of solids on auxiliary planes.

Section of solids by planes inclined to horizontal or vertical planes- true shape of sections.

MODULE IV

Development of surface of cubes, prisms, cylinders, pyramids and cones

Intersection of surfaces- methods of determining lines of intersection - intersection of prism in prism and cylinder in cylinder.

MODULE V

Introduction to isometric projection- isometric scales, isometric views- isometric projections of prisms, pyramids, cylinders, cones and spheres.

Introduction to perspective projections : visual ray method and vanishing point method- perspective of circles- perspective views of prisms and pyramids.

REFERENCES

- | | |
|-----------------------------------|--|
| 1. Engineering Graphics | P.I.Varghese & K.C. John, JET Publishers |
| 2. Elementary engineering drawing | N.D.Bhat, Charotar publishing house |
| 3. Geometric drawing, | P.S.Gill , B.D Kataria &sons Ludhiana |
| 4. Engineering Graphics | P I Varghese, VIP Publishers. |

CE/ME/EC/CS/SE/IT/EB/EI/EE 106
BASIC CIVIL&MECHANICAL ENGINEERING

(A) CIVIL ENGINEERING

MODULE I Materials: *Cement* - varieties and grade of cement and its uses. *Steel*- types of steel for reinforcement bars, steel structural sections. *Brick*- varieties and strength , tests on bricks. *Aggregates*- types & requirements of good aggregates. *Concrete*- grades of concrete as per IS code, water cement ratio, workability, mixing, batching, placing, compaction and curing.
Construction : *Foundation*- types of foundations- isolated footing, combined footing, raft, pile & well foundations,

MODULE II Super structure : Brick masonry, English bond and Flemish bond , Stone masonry, Random rubble masonry. *Roofing*- Steel trusses, roofing for industrial buildings
Surveying: Principles, instruments, ranging and chaining of survey lines, errors in chaining, field work, field book, selection of survey stations, reconnaissance ,,
Levelling : Levelling instruments, different types, temporary adjustments, mean sea level, reduced level of point, booking of field notes, reduction of levels by height of collimation method.

REFERENCES

- | | |
|---|---|
| 1. Engineering materials | : Rangwala |
| 2. Building construction | : Punmia |
| 3. A text book of building construction | : N.K.R. Murthy |
| 4. Fundamentals of civil Engineering- | : Roy M Thomas-Educational Publications |
| 5. A text book of building construction | : Jha & sinha |
| 6. Surveying & Levelling | : T P Kanetkar |
| 7. Surveying & Levelling | : Hussain |

Type of Questions for University Exam.

Q 1.Four short answer questions of 5 marks with two questions from each of the two modules.

Q 2. to Q.3 : Two questions A & B of 15 marks from each modules with option to answer either A & B.

(B) MECHANICAL ENGINEERING

MODULE III Thermodynamics: thermodynamic systems - open, closed and isolated systems, equilibrium state. of a system, property' and state, process, cycle, work, Zeroth law of thermodynamics-concept of temperature, temperature scales. First law - internal energy, enthalpy. Second law - Kelvin-Planck and Claussius statements, Carnot Cycle.
Refrigeration and Air conditioning: Vapour compression and vapour absorption refrigeration systems, summer and winter Air conditioning, Comfort and industrial Air conditioning.
Elementary ideas of simple reaction and impulse turbines, compounding of turbines.

MODULE IV Internal Combustion Engines: working of two stroke and four stroke Petrol and Diesel engines, simple Carburettor, ignition system, fuel pump, fuel injector, cooling system, lubricating system.

Transmission of Power: Belt drives (open and closed), chain drives.

Metal fabrication: Welding - Arc, gas, resistance welding, Welding defects, Soldering, Brazing

Text Books & References:

- | | |
|--|------------------------------------|
| 1. Engineering Thermodynamics | P.K.Nag |
| 2. Engineering Thermodynamics | D.B. Spalding & E.H.Cole |
| 3. Engineering Thermodynamics | Van Wylon |
| 5. Thermodynamics | J.P.Holman |
| 6. Elements of Internal Combustion Engines | Rogowsky, Tata McGraw Hill |
| 7. Fundamentals of Internal Combustion Engines | Gill, Smith & Ziurys, Oxford & IBH |
| 8. Refrigeration and Air Conditioning, | Stoecker Tata McGraw Hill |

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Q 1.Four short answer questions of 5 marks with two questions from each of the two modules.

Q 2. to Q.3 : Two questions A & B of 15 marks from each modules with option to answer either A & B.

CE/CS/EB/EC/EE/ EI/IT/ME/SE 107
BASIC ELECTRICAL ENGINEERING& ELECTRONICS

(A) ELECTRICAL ENGINEERING

Module I Basic principles of Electric circuits: Review of Ohms law - Definition of resistance, current, voltage and power - Series and parallel circuits- constant voltage source and constant current source.

Network Theorems: Kirchoffs laws- Network analysis by Maxwell's circulation currents Thevenin's theorem - Superposition theorem -Norton's theorem - Simple illustrative problems on network theorems.

Review of electrostatics - Coulomb's Law- Electric field strength and Electric flux density capacitance.

Module II Review of electromagnetic induction -Faraday's Law- Lenz's Law - mutually induced emf. Magnetic circuits - magnetic field of a coil - Ampere turns calculation - magnetic flux - flux density - field strength.

Measuring instruments: Working principle of galvanometer, Ammeter, Voltmeter, watt meter & energy meter.

AC fundamentals: Generation of alternating voltage and current - equations of sinusoidal voltage and current - wave form, cycle frequency, time period, amplitude, phase difference, rms value, average value, power factor & form factor. Vector diagram - addition and subtraction of vectors- sine waves in phase and out of phase. AC circuits: RC, RL, RLC circuits-series and parallel - current, voltage and power relationships. Poly phase circuits: vector representation phase sequence - star and delta connections.

(B) ELECTRONICS ENGINEERING

Module III Passive components: Resistor - Capacitor - Inductor - Color coding. Transformer- different types, construction.

Semiconductors: Energy band diagram - intrinsic & extrinsic semi conductors, doping - PN junction - Diodes, Zener diodes- Characteristics - Application of diodes. Rectifiers- Half wave, full wave and Bridge rectifiers - Ripple factor and regulation.

Transistors: - PNP and NPN transistors - theory of operation - Transistor configurations characteristics - comparison.

Special semiconductor devices - PET - SCR - LED - LCD - V -I characteristics, applications.

Module IV Fundamentals of Instrumentation: Transducers - Definition - Classification - Active & passive - Transducer for position, pressure, velocity, vibration and temperature measurements.

CRO - principle of operation - measurement of amplitude, frequency and phase.

Fundamentals of Communication: Analog communication - concept of modulation, demodulation. Types: AM - FM -PM- Block diagram of general communication system - Basic concepts of digital communication - Block diagram.

Text Books

1. Basic Electronics - Solid State - B. L. Theraja, S. Chand & Co.
2. Fundamentals of Electrical Engineering - Leonard S. Bobrow, Oxford University Press.

Further References:

1. Electrical Technology: Edward Hughes, Addison Wesley Publication
2. Electronic Devices & Circuits: G.K. Mithal & Ravi Mittal, Khanna Publishers

Type of Questions for University Exam.

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Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A & B.

CE/CS/EB/EC/EE/E1/IT/ME/SE 108 COMPUTER PROGRAMMING

Module I

Introduction to programming in C: Fundamental data types- integer, floating point, and enumerated data types, Expressions - arithmetic, relational and logic operators, Type conversion - simple and compound statement, Access to standard library, standard I/O-getchar, putchar, Formatted I/O, scanf, printf, error handling, line input and out put, control structures, selection statement, IF, SWITCH, WHILE, DO WHILE, FOR, BREAK, COINTINUE, GOTO, RETURN statements.

Module II

Functions: Declarations and functions, parameter passing mechanism, storage classes-scope, visibility, and life time of variables, AUTO, EXTERN, STATIC and REGISTER modifiers, Recursion.

Module III

Arrays: Single and multi dimensional arrays, sorting, selection sort, search-linear search and binary search, Structures and union.

Module IV

Pointers: Pointers and addresses, pointer arrays", function returning pointers, pointers to function, pointer arithmetic,. pointers to structures, array of structures, preprocessor directive, command line arguments, typedef.

Text Book & References:

- 1.Computer Fundamentals & Programming in C : Pradip Dey & Manas Ghosh (OXFORD)
- 2.Computer Fundamentals : Dr. Varghese Paul (EPD)
- 3.Programming in C : B.S. Gotfried (Schaum series, TMH)

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CE/CSIEBIECIEEIEI/MEIIT/SE 109
TECHNICAL COMMUNICATION AND SOCIAL SCIENCES
(Module IV Environmental Studies: 1 hour per week
Other modules : 2 hours per week)

PART - A TECHNICAL COMMUNICATION

Module I

(25 hours)

Oral Communication: starting and ending a conversation; telling and asking people to do things; expressing opinions and ideas, decisions and intentions, offers and invitations, feelings, right and wrong, numbers and money.

Purpose and audience; dealing with customers and clients; face-to-face discussions; meetings and attending meetings; checking understanding; raising questions; giving and receiving feedback; using body language; leading and directing discussions; concluding discussions; using graphics in oral presentations

Reading Comprehension and reference skills: skimming and scanning; factual and inferential comprehension; prediction; guessing meaning of words from context; word reference; comprehending graphics in technical writing.

Reading strategies; reading speed; reading between the lines for hidden meaning; interpreting graphics; using a dictionary; using an index; using a contents list to find information; choosing the right reference source.

Module II

(20 hours)

Written Communication: note making and note taking; summarising; notes and memos; developing notes into text; organisation of ideas: cohesion and coherence; paragraph writing: ordering information in space and time; short essays: description and argument; comparison and contrast; illustration; using graphics in writing: tables and charts; diagrams and flow-charts; maps, plans and graphs.

Spelling rules and tips; writing a rough draft; editing and proof reading; writing the final draft; styling text; filling in complex forms; standard letters; CV; writing a report; writing leaflets and brochures; writing references; essay writing:

expository writing; description of processes and products; classification; the instructional process; arguments and presentation of arguments; narrating events chronologically.

PART - B SOCIAL SCIENCES

Module III

(15 hours)

Science, Technology and Ethics

Impact of science and technology on the development of modern civilization. The philosophy of modern science scientific determinism - uncertainty principle. Relevance of scientific temper. Science and religion. Science and technology in developing nations. Technological advances of modern India. Intermediate and appropriate technology.

Development of technical education in India.

Senses of Engineering Ethics - Variety of moral issues - Types of inquiry - Moral dilemmas - Moral autonomy Kohlberg's theory - Gilligan's theory - Consensus and Controversy -

Professional ideals and virtues - Attributes of an ethical personality - Theories about right action - Self interest.

Responsibilities and Rights of engineers - Collegiality and Loyalty - Respect for authority - Collective bargaining Confidentiality - Conflicts of interest - Professional rights.

Module IV

Environmental Studies:

(30 hours)

Natural resources - issues related to the use and over exploitation of forest resources, water resources, mineral resources, food resources and energy resources - role of an individual in conservation of natural resources - equitable use of resources for sustainable life styles.

Concept of an ecosystem - structure and function - energy flow in the ecosystem - ecological succession - food chains, food webs and ecological pyramids - structure and functions of a forest ecosystem and an aquatic ecosystem.

Definition of biodiversity - genetic, species and ecosystem diversity - biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.

Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, marine pollution, thermal pollution and nuclear hazards - Causes, effects and control measures of urban and industrial solid wastes -Role of an individual in prevention of pollution - An overview of the various environmental legislations in India - Issues involved in enforcement of environmental legislation.

The concept of sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, water shed management - Resettlement and rehabilitation of people; its problems and concerns - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust - Population growth and problems of population explosion - Environmental ethics: issues and possible solutions..

Text Books:

Meenakshi Raman and Sangeetha Shanna : Technical Communication: Principles and Practice, Oxford University Press, 2004

Rajagopalan. R : Environmental Studies: From Crisis to Cure, Oxford University Press, 2005

Jayashree Suresh and B.S. Raghavan : Professional Ethics, S. Chand & Company Ltd, 2005. History of Science, Cambridge University Press.

Adrian Doff & Christopher Jones, References: Language in Use. Upper intermediate, self-study workbook & classroom book, Cambridge University Press,2000

Krishna Mohan & Meenakshi Raman, Effective English Communication ,Tata Mc-Graw Hill,2000.

Edmund D. Seebaur & Robert L. Barry Fundamentals of Ethics for Scientists and Engineers, Oxford University Press, 2001

Krishna Mohan & Meera Banerji, Developing Communication Skills Mac Millan India Ltd,2000.

Rajendra Pal & JS Koriahalli

Essentials of business communication, S. Chand & Company Ltd

Sarah Freeman,

Study Strategies, Orient Longman, 1978.

Meenambal T , Uma R M and K MuraU

Principles of Environmental Science and Engineering, S. Chand & Company Ltd, 2005

University Examination pattern

The question paper will have two parts. Part A (Technical Communication) will cover Modules I, II and will have a weightage of 50 marks. Part B (Social Sciences) will cover Module III and Module IV (Environmental Studies) and will have a weightage of 50 marks. Part A and Part B will have to be answered in separate answer books.

Part A

University examination pattern

Q1- 4 short type questions of 5 marks, 2 each from module I and II

Q II - 2 questions A and B of 15 marks from module I with choice to answer any one QIII-2 questions A and B of 15 marks from module II with choice, to answer any one

Part B

University examination pattern

Q I - 5 short type questions of 4 marks , 2 from module III and 3 from module IV

QII- 2 questions A and B of 10 marks from module III with choice to answer anyone

Q III -2 questions A and B of 20 marks from module IV with choice to answer any one.

**CE/CSIEBIECIEEIEI/MEIIT/SE 110
COMPUTER PROGRAMMING LABORATORY**

1. Study of as commands. General introduction to application packages.
- 2 Programming using C control structures & pointers.
3. Searching & sorting
4. Creation and use of databases in a suitable database package
5. Programming exercises in C.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50 % marks separately for the two components to be eligible for a pass in that subject.

**CE/CSIEBIECIEEIEI/MEIIT/SE 111
ELECTRICAL AND MECHANICAL WORKSHOPS**

ELECTRICAL WORKSHOP

1. One lamp controlled by one switch
2. Series and parallel connections of lamps.
3. Stair case wiring.
4. Hospital Wiring.
5. Godown wiring.
6. Fluorescent lamp.
7. Connection of plug socket.
8. Different kinds of joints.
9. Transformer winding.
10. Soldering practice.
11. Familiarisation of CRO.

MECHANICAL WORK SHOP

- 1) Fitting Shop.
- 2) Sheet Metal Shop
- 3) Foundry Shop
- 4) Welding Shop
- 5) Carpentry Shop (Preliminary exercises for beginners in all shops. Specific models may be designed by the teachers.)

Introduction to the use of concrete mix.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be assessed by two examiners. A candidate shall secure a minimum of 50 % marks separately for the two components to be eligible for a pass in that subject.