COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY
EXCERPTS FROM B. TECH (ENGINEERING) REGULATIONS-2006

2. Duration of the Course

2.1 The curriculum requirement of B.Tech degree shall consist of a period of 4 academic years as prescribed in the curriculum

2.2 The first two semesters will be combined together as first year, and the remaining three years shall be split into 6 semesters. Examinations will be conducted at the end of the year / semester in subjects prescribed in the respective scheme of examinations.

2.3 The teaching programmes for each semester shall consist of 15 weeks and that for the first year will consist of 30 weeks.

3. Promotion to Higher Semesters

3.1 the candidate shall be eligible for promotion form one semester to the next semester only if:

a) he / she has secured a minimum of 75% attendance, and

b) his / her progress and conduct have been satisfactory

Promotion from one semester to the next semester shall be subject to the condition that the candidate to be promoted to the nth semester should have secured a pass in all papers upto the (n-3) semester

4. Eligibility for the Degree

4.1 No candidate shall be eligible for the B.Tech degree unless he has undergone the prescribed course of study for a period of 4 academic yeas in the university and has passed the prescribed examinations in all the semesters.

4.2 The candidates shall complete all requirements for degree within a period of 6 academic years from the date of admission to the first year.

5. Subjects of Study & Scheme of Examinations

5.1 B. Tech degree courses will be offered in the following disciplines.

a) Civil Engineering

b) Mechanical Engineering

c) Electronics And Communication Engineering

d) Electrical & Electronics Engineering

e) Computer Science And Engineering

f) Information Technology

g) Safety And Fire Engineering

h) Marine Engineering

i) Electronics And Instrumentation Engineering

j) Electronics & Bio-Medical Engineering

k) Food Technology

5.2 The subjects of study and scheme of examinations of each discipline are given in Annexures.

5.3 Conduct of Examinations

The duration of all university examinations in theory and practical shall be of 3 hours.

5.4 For all labs from combined semester I & II to semester VII, 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. The continuous evaluation shall be guided by clause 7.1

5.5 University examination question paper in theory subjects shall have:

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 module with option to answer either A or B

6.   Rules Regarding Attendance

The rules followed for B.Tech courses of the CUSAT will be applicable.

7.   Rules Regarding Sessional Marks:

7.1   The total sessional marks for theory and laboratory courses shall be made up to 50% for internal tests, 30% for assignments and 20% for attendance. Out of the 20% assigned for attendance, 10% shall be awarded to those who secure 75% of the total attendance and rest 10% will be awarded at the rate of one mark for every additional 5% of attendance or part thereof.

7.2   A candidate shall be allowed to repeat the course work in one or more semesters in order to better the sessional marks already obtained, subject to the following conditions.

   a)   He shall repeat the course work in a particular semester only once, and that too at the earliest opportunity offered to him.

   b)   He shall not combine this course work with his regular course work.

   c)   He shall not be allowed to repeat the course work of any semester if he has already passed that semester examination in full.

   d)   The sessional marks obtained by the repetition of course work in all subjects will be considered for all purposes.

8.   Rules for Re-admission

The rules followed for B.Tech course of the CUSAT will be applicable.

9.   Pass Requirements & Classification of Successful Candidates:

9.1   A candidate who secures not less than 45% marks in a subject at the university examinations and 50% aggregate marks in the university examination and sessional marks put together shall be declared to have passed in the examination in that subject. In subjects where there are no university examinations, a candidate shall secure 50% sessional marks for a pass in that subject.

9.2   A candidate who qualifies for the degree by passing all the subject of the eight semesters within five academic years (ten consecutive semesters) after the commencement of his course of study and secures not less than 75% of the aggregate of total marks of all eight semesters shall be declared to have passed the B.Tech degree examination in First Class with Distinction.

9.3   A candidate who qualifies for the degree passing all the subject of the eight semesters within five academic year (ten consecutive semesters) after the commencement of his course of study and secures not less than 60% of the aggregates of total marks of all the eight semesters shall be declared to have passed the B.Tech Degree Examination in first class.

9.4   All other successful candidates shall be declared to have passed the B.Tech degree examination in second class.

9.5   Ranking among the candidates will be limited to those who have passed all the examinations in the first available chance and have secured at least first class.

9.6   Candidates can be permitted to cancel examination in a particular subject of any semester provided he/she applies for cancellation of the examination through the Principal within 10 days to the Controller of Examinations. This will not be considered as a chance. But such candidates who have cancelled an examination will not be considered for ranking.

10. Revision of Curriculum

10.1   The University may from time to time, revise, amend or change the regulations, scheme of examinations and syllabi.

10.2   In the case of students already undergoing the course the change will take effect from the beginning of the following semester after the changes are introduced and shall be applicable to the part of the course that remains to be completed unless otherwise decided.

10.3   Whenever there is a change in the existing scheme of examinations, the university examinations based on the old scheme / syllabi will be conducted for two more academic years.

B.TECH DEGREE COURSE IN ENGINEERING

SCHEME OF EXAMINATIONS (2006 Admissions onwards)

Semester I & II

(Common for all branches)

Subject Code	Subject	Hrs./ week		Marks		
		L	T/D/P	Internal	University	Total
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 & Mechanical Engineering	2		50	100	150
CE/CS/EB/EC/EE/EI/IT/ME/SE 107	Basic Electrical Engineering & 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 & 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 & Mechanical Workshops		3	100		100
	Total	**20**	**10**	**650**	**900**	**1550**

*1 hour/week for Environmental Studies

SYLLABUS FOR B.TECH I & II SEMESTER
(2006 Admissions)

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 : Internal 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.
Taylors 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

TEXT BOOKS:
Engineering mathematics -Vol1:S.S.Sastry, PHI publishers
Advanced Engineering Mathematics: Erwin Kreyzig,
Wiley Eastern

REFERENCES:
Mathematical Techniques: Oxford University Press
Engineering Mathematics: T.Veerarajan, TMGH Publishers
Higher Engineering Mathematics: B.S.Grewal, Khanna Publishers

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 II superconductors – Isotope effect - High temperature superconductors – Josephson effect – SQUIDS – Applications of superconductors

Text and Reference Books :

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*

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, Kirchhof.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.

CE/CS/EB/EC/EE/EI/IT/ME/SE 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'Alemberts principle of rotation. Resultant inertia force in rotation. Principle of angular momentum in rotation. Energy equation for rotating bodies.

TEXT BOOK & 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.
    4. Engineering mechanics- Biju N- Educational Publishers.

CE/CS/EB/EC/EE/EI/IT/ME/SE 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.

TEXT BOOKS & 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.

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

(A) CIVIL ENGINEERING

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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.

Text Books & References :
1. Engineering materials   : Rangawala
2. Building construction   : Punmia
3. A Text book of building construction : N.K.R. Murthy
4. Fundamentals of Civil Engineering-   : Roy M Thomas-Educational Publishers.
5. A Text book of building construction : Jha & Sinha
6. Surveying & Levelling   : T P Kanetkar
7. Surveying & Levelling   : Hussain

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(B) MECHANICAL ENGINEERING

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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-Plank 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

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: Kirchoff's 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 - FET - 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 Book:

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

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

Module I

Introductionn 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)

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 – uncertainity 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 eco system.

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 Sharma	*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.
WC Dampier	*History of Science*, Cambridge University Press.

References:

Adrian Doff & Christopher Jones,	*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 Korlahalli	*Essentials of business communication*, S. Chand & Company Ltd
Sarah Freeman,	*Study Strategies*, Orient Longman, 1978.
Meenambal T , Uma R M and K Murali	*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
Q I - 4 short type questions of 3 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
Q III - 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
Q II - 2 questions A and B of 10 marks from module III with choice to answer any one
Q III - 2 questions A and B of 20 marks from module IV with choice to answer any one

CE/CS/EB/EC/EE/EI/ME/IT/SE 110
COMPUTER PROGRAMMING LABORATORY

1. Study of OS 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.

CE/CS/EB/EC/EE/EI/ME/IT/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. Fluroscent 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.