University of Pune

Faculty of Engineering

F.E. (Common to All Branches) 2008 Structure (w.e.f. June-2008)

PART – I

CODE	SUBJECT	TEACHING SCHEME			EXAMINATION SCHEME				
		Lect.	Tut.	Pract./ Drg.	Paper	TW	Oral	Pr	Total
107001	Engineering Mathematics-I	4	-	-	100	-	-	-	100
107002	Applied Science – I	4	-	2	100	25	-	-	125
110003	Fundamentals of Programming languages.	1	-	2	-	-	-	50**	050
103004	Basic Electrical Engineering	3	-	2	100	25	-	-	125
101005	Basic Civil and Environmental Engineering	3	-	2	100	25	-	-	125
102006	Engineering Graphics – I	3	-	2	100	-	-	-	100
111007	Manufacturing Practices	-	-	2	-	25	-	-	025
Total of Part – I		18	-	12	500	150	-	-	650

PART – II

CODE	SUBJECT	TEACHING SCHEME			EXAMINATION SCHEME				
		Lect.	Tut.	Pract./ Drg.	Paper	TW	Oral	Pr	Total
107008	Engineering Mathematics-II	4	-	-	100	-	-	-	100
107009	Applied Science – II	4	-	2	100	25	-	-	125
101010	Engineering Mechanics	3	-	2	100	25	-	-	125
104011	Basic Electronics Engineering	3	-	2	100	25	-	-	125
102012	Engineering Graphics – II	1	-	2	-	50	-	-	050
102013	Basic Mechanical Engineering	3	-	2	100	25	-	-	125
	Communication Skill *	-	-	2	-	-	-	-	-
Total of Part – II		18	-	12	500	150	-	-	650

* Communication Skill : Practical will be conducted by respective departments,. hence no subject code is allotted..

** This change has been done in the Meeting of Dean & Chairman of Faculty of Engineering held on dt. 23-5-2008.

UNIVERSITY OF PUNE

Syllabus for Engineering Degree Course – Revision 2008

F.E. Semester – I: 107001 – Engineering Mathematics – I

Teaching Scheme:	Examination Scheme:
Lectures – 4 Hrs./Week	Paper – 100 Marks\(3 Hrs. Duration)

Unit 1 (09 Hrs.)

Matrices: Rank, Normal form, System of Linear Equations, Linear Dependence and Independence, Linear and Orthogonal Transformations. Eigen values, Eigen Vectors, Cayley – Hamilton Theorem. Application to problems in Engineering (Translation and Rotation of Matrix).

Unit 2 (09 Hrs.)

Complex Numbers & Applications: Argand's Diagram, De'Moivre's theorem and its application to find roots of algebraic equations. Hyperbolic Functions, Inverse Hyperbolic Functions, Logarithm of Complex Numbers, Separation into Real and Imaginary parts, Application to problems in Engineering.

Unit 3 (09 Hrs.)

Infinite Series: Infinite Sequences, Infinite Series, Alternating Series, Tests for Convergence, Absolute and Conditional Convergence, Range of Convergence.

Differential Calculus: Successive Differentiation, Leibnitz Theorem.

Unit 4 (09 Hrs.)

Expansion of Functions: Taylor's Series and Maclaurin's Series.

Differential Calculus: Indeterminate Forms, L' Hospital's Rule, Evaluation of Limits.

Unit 5 (09 Hrs.)

Partial Differentiation and Applications: Partial Derivatives, Euler's Theorem on Homogeneous Functions, Implicit functions, Total Derivatives, Change of Independent Variables.

Unit 6 (09 Hrs.)

Jacobian: Jacobians and their applications. Errors and Approximations.

Maxima and Minima: Maxima and Minima of Functions of two variables, Lagrange's method of undetermined multipliers.

Text Books:

Higher Engineering Mathematics by B.V. Ramana (Tata McGraw-Hill).

Advanced Engineering Mathematics by Erwin Kreyszig (Wiley Eastern Ltd.).

Reference Books:

Advanced Engineering Mathematics, 7e, by Peter V. O'Neil (Thomson Learning).

Advanced Engineering Mathematics, 2e, by M. D. Greenberg (Pearson Education).

Higher Engineering Mathematics by B. S. Grewal (Khanna Publication, Delhi).

Applied Mathematics (Volumes I and II) by P. N. Wartikar & J. N. Wartikar (Pune Vidyarthi Griha Prakashan, Pune).

UNIVERSITY OF PUNE
Syllabus for Engineering Degree Course-Revision 2008
F.E. Semester – I : 107002 – Applied Science – I

Teaching scheme:	**Examination scheme:**
Lectures – 4 Hrs./Week	Paper – 100 Marks(3Hrs)
Practicals- 2Hrs./Week	T.W. 25 Marks

Both schemes are exactly half for Chemistry and Physics each

Chemistry

Unit 1 : Solid state and materials chemistry (08 Hrs.)

Crystallography:- Unit cell, Bravais lattices, Cubic crystals - CN, APF, radius ratio. Three laws of crystallography, Weiss indices and Miller indices with numericals, X-ray diffraction – Bragg's Law and numericals. Crystal defects (point and line defects) and their effects on properties of crystals.

Zinc sulphide – structure and applications as luminescent.

Molecular electronics:-Basic concepts. Study of following molecules for their structures and properties on the basis of orbitals, chemical bonding, band theory, electrical conductivity, applications in electronics such as in diodes, transistors, ICs, photovoltaic devices, sensors etc.

1.Conductive polymers-polypyrrole, polythiophene
2.Pure carbon compounds- graphite, single wall and chiral carbon nano-tubes, fullerenes
3. Liquid crystals
4.Charge transfer compounds-tetrathiofulvalene.

Unit 2 : Volumetric analysis (08 Hrs.)

Standard solutions and their preparations, various ways of expressing concentrations of solutions, equivalent weights in different types of reactions. Volumetric analysis – acid-base, complexometric, oxidation-reduction, precipitation – with specific examples, theories of indicators used in above titrations, titration curve (acid-base only) numericals on all above.

Unit 3 : Polymers (08 Hrs.)

Definition and important terms: Monomer, Polymer, Polymerization, Degree of polymerization (Dp), Glass transition temperature (Tg), Molecular weight, Polymer dissolution.

Classification on the basis of - a) Polymerization mechanism – (step and chain polymers , brief mechanism should be explained), b) Polymerization reactions – (addition and condensation), c)Thermal behaviour–(thermoplastics and thermosetting), d)Types of monomers– (homopolymer and copolymer).

Commercial Polymers–Synthesis, properties and applications- Polyethylene (PE), Polypropylene (PP), Polyvinyl chloride (PVC), Polystyrene (PS), Phenol formaldehyde (PF), Acrylonitrile butadiene styrene (ABS), Epoxy resin .

Compounding of Plastics.

Rubbers-Synthesis, structure, properties and applications of a) Natural rubber–isolation, Polyisoprene. b) Vulcanized rubber-Valcanisation of rubber by sulfur. c) Synthetic rubber-Styrene – Butadiene rubber, Silicon rubber and Neoprene rubber.

Speciality polymers –Basic concepts and applications of conductive, liquid crystalline, thermally stable and biodegradable polymers. Polymer composites, Recycling of polymers.

Term work : Any four experiments

1. To standardize $KMnO_4$ solution by preparing standard oxalic acid and to estimate ferrous ions.
2. To standardize $Na_2S_2O_3$ solution by preparing standard potassium dichromate and to estimate percentage of copper from brass.
3. To determine phenol by iodometric method.
4. To determine molecular weight of a polymer using Ostwald viscometer.
5. Preparation of (any one) polystyrene, urea formaldehyde, phenol formaldehyde and its characterization.
6. To determine chloride ions from solution by Volhard method.
7. To determine calcium from the given sample of cement by volumetric method.

Term work is based on performance and regular checking of the experiments.

Reference Books :

1.Chemistry, Raymond Chang. (Tata McGraw Hill).
2.Principles of the solid state, H.V. Keer (New age international publishers).
3.Polymer Science, V.R. Gowarikar (Wiley Eastern Ltd.).
4. Inorganic quantitative analysis, Vogel. (Prentice Hall).
5. Text book of engineering chemistry, R.N. Goyal and Harrmendra Goel, (Ane books India).

Laboratory Manual :

1. Laboratory Manual on Engineering Chemistry, Sudharani (Dhanpat Rai Publishing Company).

Physics

Unit 4 : Interference and electron Optics

Interference:- Interference of waves, Interference due to thin films of uniform (with derivation) and non-uniform thickness (without derivation), Fringe width, Newton's Rings, Applications of Newton's Rings for determination of (i) wavelength of incident light / radius of curvature of Plano convex lens (ii) refractive index of a given liquid; Michelson's interferometer, applications for determination of (i) wavelength of a monochromatic source (ii) refractive index /thickness of a transparent material; Engineering applications of interference (i) Testing of optical flatness of surfaces (ii) Nonreflecting / Antireflection coatings. **(05 hrs.)**

Electron Optics :- Motion of an electron in electric (parallel, perpendicular) and magnetic (extensive, limited) fields, crossed fields. Electrostatic and magneto static focusing, Scanning electron microscope (SEM) , Bainbridge mass spectrograph.

Unit 5 : Diffraction and ultrasonic **(03 hrs.)**

Diffraction : - Diffraction of waves, classes of diffraction, Fraunhoffer diffraction at a single slit (geometrical method), conditions for maxima and minima, Intensity pattern due to a single slit, Plane diffraction grating, conditions for principal maxima and minima, intensity pattern; Resolving power, Resolving power of a grating. **(05 hrs.)**

Ultrasonics :- Ultrasonic waves, Piezo-electric effect, Production of ultrasonic waves by Piezoelectric oscillator, Magnetostrictive effect, Production of ultrasonic waves by magnetostrictive oscillator, properties of ultrasonic waves, Applications of ultrasonic waves (i) Scientific- Echo sounding, Sound signaling, depth sounding, SONAR, cleaning of dirt etc (ii) Engineering –thickness measurement, cavitation, Ultrasonic cleaning, Nondestructive testing, Flaw detection, Soldering, Drilling and welding (iii) Medical- for diagnostics and treatment

Note: **Discuss any one application for 4 marks** **(03 hrs.)**

Unit 6: Polarisation and nuclear physics

Polarisation :- Introduction, production of plane polarised light by refraction (pile of plates), Law of Malus, Double refraction, Huygen's theory of double refraction, Cases of double refraction of crystal cut with the optic axis lying in the plane of incidence and (i) parallel to the surface (ii) perpendicular to the surface (iii) inclined to the surface, Retardation plates-quarter wave plate (QWP), Half wave plate (HWP); Analytical treatment of light for the production of circularly and elliptically polarised light, Detection of various types of light (PPL, CPL, EPL, Upl, Par PL), Optical activity, Specific rotation, Polaroids **(05 hrs.)**

Nuclear Physics :- Nuclear fission in natural Uranium-Chain reaction, Critical size. Nuclear fuels, Nuclear fusion, and thermonuclear reactions-P-P and CN cycles, Particle accelerators-cyclotron, betatron. **(03 hrs.)**

Reference Books:

1.Optics, Jenkins and White (Tata Mcgraw Hill)
2.Text Book of Optics, Brijlal and Subramanyam (S. Chand and Company)
3.University Physics, Young and Freedman (Pearson Education).
4.Fundamentals of Physics, Resnick and Halliday (John Wiley and Sons).
5. Concepts of Modern Physics-Beiser (Tata Mcgraw Hill)

<u>Term Work: Any Four experiments</u>

1.Determination of wavelength by using diffraction grating.
2.Newton's Rings (Determination of wavelength/radius of curvature /refractive index of a liquid).
3.Experiment on ultrasonic waves.
4.Resolving Power of a telescope / grating.
5.Determination of specific rotation by Laurent's half shade polarimeter.
6.Demonstration of Lissajous figures (principles of interference and polarisation) using a CRO, phase measurement.
7.Michelson's interferometer
8. Determination of e/m by Thomson's method.
9.An experiment on polarization.
(Determination of polarising angle for glass and to determine refractive index of glass using Brewster's law **Or** Experimental verification of law of Malus).
10.Determination of wavelength of the given source by Fraunhoffer diffraction at a single slit.

Term work is based on performance and regular checking of the experiments.

University of Pune
First Year Engineering Course

110003: Fundamentals of Programming Languages

Teaching Scheme	**Examination Scheme**
Theory : 1 Hr/Week	**Practical : 50 Marks**
Practical: 2 Hrs/Week	

Objectives

- To learn and acquire art of computer programming
- To know about some popular programming languages and how to choose a programming language for solving a problem using a computer
- To learn to program in C

1. Program Planning Concepts

Algorithm; Advantages of Generalized Algorithms; How to Make Algorithms Generalized; Avoiding Infinite Loops in Algorithms – By Counting, By using a Sentinel Value; Different ways of Representing an Algorithm – As a Program, As a Flowchart, As a Pseudo code; Need for Planning a Program before Coding; Program Planning Tools – Flowcharts, **Structure charts**, Pseudo codes; Importance of use of Indentation in Programming; Structured Programming Concepts – Need for Careful Use of "Go to" statements, How all programs can be written using Sequence Logic, Selection Logic and Iteration (or looping) Logic, functions.

2. Programming Languages

What is a Programming Language; Types of Programming Languages – Machine-level, Assembly-level and High-level Languages, **Scripting Languages, Natural Languages**; Their relative Advantages and Limitations; High-level Programming Language Tools – Compiler, Linker, Interpreter, Intermediate Language Compiler and Interpreter, Editor, **Matlab, GUI**; Overview of some popular High-level Languages – FORTRAN, COBOL, BASIC, Pascal, C, C++, JAVA, LISP; Characteristics of a Good Programming Language; Selecting a Language out of many Available Languages for Coding an Application; Subprograms.

3. Program Testing and Debugging

Definition of Testing & Debugging; Difference between Testing and Debugging; Types of Program Errors; Testing a Program; Debugging a Program for Syntax Errors; Debugging a Program for Logic Errors, **Concept of APIs/Libraries**.

4. Program Documentation

What is Documentation; Need for Documenting Programs and Software; Forms of Documentation – Comments, System Manual, User Manual; Documentation Standards and **Notations.**

5. Programming in C Language

Character set, Constants, Variables, Keywords and Comments; Operators and Operator Precedence; Statements; I/O Operations; Preprocessor Directives; Pointers, Arrays and Strings; User Defined Data Types – Structure and Union; Control Structures – Conditional and Unconditional Branching Using "if", "switch", "break", "continue", "go to" and "return" Statements; Loop Structures – Creating Pretest Loops using "for" and "while" Statements; Creating Posttest Loops using "do…while" statement; Functions – Creating Subprograms using Functions; Parameter Passing by Value; Parameter Passing by Reference; Main Function.

Term Work

Term work shall consist of a record in the form of a journal consisting of at least twelve exercises/assignments on programming in C that includes flowcharts, pseudo codes and printouts of the programs and **necessary documentation** for the following exercises:

1. Write a C program to accept five numbers from console and then to display them back on console in ascending order.
2. Write a C program to calculate the sum of all numbers from 0 to 100 (both inclusive) that are divisible by 4.
3. Write a C program to accept the length of three sides of a triangle from console and to test and print the type of triangle – equilateral, isosceles, right angled, none of these.
4. Write a C program to accept a string from console and to display the following on console:
   (a) Total number of characters in the string
   (b) Total number of vowels in the string
   (c) Total number of occurrence of character 'a' in the string.
   (d) Total number of occurrence of string 'the' in the string.
5. Write a program in C to reverse the digits of a given integer.
6. Write a program in C to read an integer and display each of the digit of the integer in English.
7. Write a program in C to generate first 20 Fibonacci numbers
8. Write a program in C to generate prime numbers between 1 and *n*.
9. Write a program in C to compute the GCD of the given two integers
10. Write a program in C to compute the factorial of the given positive integer using recursive function.
11. Write a program in C to compute the roots of a quadratic equation.
12. Write a program in C to sort *n* integers using bubble sort.
13. Write a program in C to compute addition/subtraction/multiplication of two matrices. Use functions to read, display and add/subtract/multiply the matrices.
14. Write a program in C to carry out following operations on strings using library functions
    a. To concatenate a string S_2 to string S_1.
    b. To find the length of a given string
    c. To compare two strings S_1 and S_2.
    d. To copy a string S_2 to another string S_1.
15. A data file contains a set of examination scores followed by a trailer record with a value of -1. Write a C program to calculate and print the average of the scores.

The instructor may choose from the assignments given above and may modify them, if necessary.

Text Book

1. Pradeep K. Sinha and Priti Sinha, "Computer Fundamentals: Fourth Edition", BPB Publications, 2007.
2. **Behrouz A. Forouzan, Richard F. Gilberg, "COMPUTER SCIENCE – A Structred Programming approach using C", Indian Edition, Thomson, 3rd edition**

Reference Books

1. Kernighan, **Ritchie**, "The C Programming Language", Prentice Hall of India
2. **Carlo Ghezi, Mehdi Jazayeri, "Programming Language Concepts", John Wiley and Sons**
3. E. Balagurusamy, "Programming in ANSIC C", Tata McGraw Hill, 2002
4. Yashavant Kanetkar, "Let Us C" – Seventh Edition, BPB Publications, 2007

UNIVERSITY OF PUNE

THE SYLLABUS IS PREPARED BY :

BOS- Electrical Engineering,

SUBJECT : BASIC ELECTRICAL ENGINEERING (103004)

Note : This syllabus is subject to change without prior notice by the concerned BOS

BASIC ELECTRICAL ENGEERING (103004)

Teaching scheme	**Examination scheme**
Lectures - 3Hrs/Week	Paper-100 Marks (3Hrs.Duration)
Practical -2Hrs/Week	Term work- 25 Marks

SECTION – I

Unit 1.General:

Concepts of emf., p.d. and current, resistance, effect of temperature on resistance. resistance temperature coefficient, insulation resistance. S.I. units of work, power and energy. Conversion of energy from one form to another in electrical, mechanical and thermal systems. batteries and cells, their types, primary cells and secondary cells, Lead Acid, Ni-Cd and Ni-MH batteries, current capacity and cell ratings. charging , importance of initial charging and discharging of batteries. series and parallel battery connections, maintenance procedure. (6 Hrs)

Unit 2. D.C.Circuits:

Classification of electrical networks, Ohm's law, Kirchhoff's law and their applications for network solutions. Simplifications of networks using series and parallel combinations and star-delta conversions, Superposition theorem, Thevenin's theorem and maximum power transfer theorem. (8 Hrs)

Unit 3.Electromagnetism:

Magnetic effect of an electric current, cross and dot conventions, right hand thumb rule and cork screw rule, nature of magnetic field of long straight conductor, solenoid and toroid. concept of m.m.f., flux, flux density, reluctance, permeability and field strength, their units and relationships. simple series and parallel magnetic circuits, comparison of electrical and magnetic circuit, force on current carrying conductors placed in magnetic field, Fleming's left hand rule.

Faradays laws of electromagnetic induction, statically and dynamically induced e.m.f., self and mutual inductance, coefficient of couplings. energy stored in magnetic field. (7 Hrs)

SECTION – II

Unit 4. Electrostatics and AC fundamentals:

A) Electrostatics field, electric flux density, electric field strength, absolute permittivity, relative permittivity, capacitance and capacitor, composite dielectric capacitors, capacitors in series and parallel, energy stored in capacitors, charging and discharging of capacitors and time constant. (3 Hrs)

B) Sinusoidal voltages and currents, their mathematical and graphical representation, Concept of instantaneous, peak(maximum), average and r.m.s. values, frequency , cycle, period, peak factor and form factor, phase difference ,lagging, leading and in phase quantities and phasor representation. rectangular and polar representation of phasors. (4Hrs)

Unit 5. Single phase A.C. Circuits:

Study of A.C. circuits consisting of pure resistance, pure inductance, pure capacitance and corresponding voltage-current phasor diagrams and waveforms. Development of concept of reactance, study of series R-L, R-C, R-L-C circuit and resonance, study of parallel R-L, R-C and R-L-C circuit, concept of impedance , admittance, conductance and susceptance in case of above combinations and relevant voltage-current phasor diagrams, concept of active, reactive and apparent power and power factor. (7 Hrs)

Unit 6. Polyphase A.C.Circuits and Single phase Transformers:

A) Polyphase A.C.Circuits: Concept of three-phase supply and phase sequence. voltages, currents and power relations in three phase balanced star-connected loads and delta-connected loads along with phasor diagrams. (3 Hrs)

B) Single phase transformers: Construction, principle of working, e.m.f. equation, voltageand current ratios. losses, definition of regulation and efficiency, determination of these by direct loading method. descriptive treatment of autotransformers and dimmerstats. (4Hrs)

Term work:

The term work shall consist of record of minimum eight exercises and experiments, out of which Group A is compulsory and any five experiments from Group B should be conducted.

Group A

1. Wiring Exercises:
   a) Study of various wiring components (wires, switches, fuse, sockets, plugs, lamp holders, lamps etc. their uses and ratings).
   b) Control of two lamps from two switches (looping system).
   c) Staircase wiring.
   d) Use of Megger for insulation test and continuity test of wiring installations and machines.
2. a) Study of fluorescent tube circuit.
   b) Study of compact fluorescent lamp(CFL).
   c) Study of HID lamps such as mercury vapour lamp /sodium vapour lamp.
3. a)Study of safety precautions while working on electric installations and necessity of earthing.
   b) Introduction to energy conservation and simple techniques to achieve it.

Group B

4. Determination of temperature rise of medium resistance such as shunt field winding.
5 . Verification of Kirchhoff's laws and Superposition theorem.
6. Verification of Thevenin's theorem.
7. Study of R. L. C. series circuits.
8. Verification of current relations in three phase balanced star and delta connected loads.
9. Single phase transformer
a)Voltage and current ratios.
b) Efficiency and regulations by direct loading.

Note: College should provide printed text and figures for Group A experiments and only printed text for Group B experiments.

Text Books *:*

1. A Textbook of Electrical Technology Volume- I – B.L.Theraja, S.Chand and Company Ltd.,
2. New Delhi.
3. Basic Electrical Engineering, V.K.Mehta, S.Chand and Company Ltd., New Delhi.
4. Electrical Engineering- G.K.Mittal
5. Theory and problems of Basic Electrical Engineering- I.J.Nagrath and Kothari, Prentice-Hall of India Pvt. Ltd.

Reference Books :

1. Electrical Technolgy- Edward Hughes, Seventh Edition, Pearson Education
2. Elements of Electrical Technology- H.Cotton, C.B.S. Publications
3. Basic circuits analysis by John Omalley Shawn Mc Graw Hill.
4 Principles of Electrical Engineering by Del. Toro, PH

101005 Basic Civil and Environmental Engineering

Teaching Scheme	**Examination Scheme**
Theory: 3 Hours/Week	**Paper 100 Marks**
Practicals 2 Hours/Week	**Term Work: 25 Marks**

Section I

Unit 1: Introduction to Civil Engineering (6 hours)

a) Role of Civil Engineer in the construction of buildings, dams, expressways and infrastructure projects for 21st century. Importance of an interdisciplinary approach in engineering.

b) Basic Areas in Civil Engineering Surveying, Construction Engineering, Project Management, Transportation Engineering, Fluid Mechanics, Irrigation Engineering, Structural Engineering, Geotechnical and Foundation Engineering, Environmental Engineering, Quantity Surveying, Earthquake Engineering, Infrastructure Development, Town Planning, Remote Sensing.

Unit 2: Materials and Construction (6 hours)

a) Use of basic materials cement, bricks, stone, natural and artificial sand, Reinforcing Steel-Mild, Tor and High Tensile Steel. Concrete types - PCC, RCC Prestressed and Precast. Introduction to smart materials. Recycling of materials.

b) *Substructure*-Function of Foundations, (Only concepts of settlement and Bearing capacity of soils.) Types of shallow foundations, (only concept of friction and end bearing pile).

c) *Superstructure* - Types of loads :- DL and LL, wind loads, earthquake considerations. Types of Construction-Load Bearing, Framed, Composite. Fundamental requirements of masonary.

d) Introduction to automation in construction:- Concept, need, examples related to different civil engineering projects.

Unit 3: Uses of maps and field surveys (6 hours)

a) Various types of maps and their uses. Principles of survey.
Modern survey methods using levels, Theodolite, EDM, lasers, total station and GPS. Introduction to digital mapping. Measuring areas from maps using digital planimeter.

b) Conducting simple and differential levelling for setting out various benchmarks, determining the elevations of different points and preparation of contour maps. Introduction to GIS Software and other surveying softwares with respect to their capabilities and application areas.

Section II

Unit 4: Ecology and Eco System (6 hours)

a) Concept of Environment - biotic and abiotic factors. Concept of the ecological cycle. Impact of the human behaviour and the technological advancements on the environment. Need for conserving natural resources and preserving the environment. Engineer's role in achieving sustainable development. Environmental Impact Assessment (EIA).
b) Introduction to solid waste management, Disposal of electronic wastes.

Unit 5 :Planning for the Built Environment (6 hours)

a) Concept of an integrated built environment-natural and manmade. Principles of planning, viz. Aspect, Prospect, Roominess, Grouping, Privacy, Circulation, Sanitation, Orientation, Economy. Role of by-laws in regulating the environment.
b) Use of various eco-friendly materials in construction. Concept of green buildings.

Unit 6: Energy and Environmental Pollution (6 hours)

a) Types of energy:- conventional and non-conventional. Need for harnessing alternative energies to meet the increased demand. Methods of harnessing energies.
b) Sources, causes, effects and remedial measures associated with
   1. Air Pollution
   2.Water treatment :- Objective, drinking water standards, pollution,introduction to waste water treatment.
   3. Noise Pollution
   4. Land Pollution

Term Work:

Any 8 Practical Exercises from those given below should be carried out, record to be submitted in the field book and file which will form a part of termwork.

1. Study of any 4 types of maps and writing their uses.
2. Exercise on use of dumpy level and laser level.
3. Measurement of area of irregular figures by digital planimeter.
4. Drawing of plan elevation & section for a residential building, single storeyed framed/load *bearing* structure. Preparing schedule of openings [On half imperial sheet.]
5. Determination of coordinates of a traverse using Global Positioning system **(GPS)**
6. Measurement of distance by **EDM** and comparing it with the distance measured using tape.
7. Visit to a construction site for studying the various construction materials used, type of structure, type of foundation and components of superstructure – submission of visit report.
8. Demonstration of use of any 4 Civil Engineering softwares.
9. Making a poster (Full imperial sheet size) in a group of 4 students, related to Energy/Environment.
10. Presentation in a group of 4 students, any case study related to Energy/Environment.

TEXT BOOKS:

1. Surveying and Levelling --- Kanetkar and Kulkarni, PVG Prakashana
2. Environmental Studies D.L.Manjunath – Pearson Education.
3. Building Construction --- Bindra Arora; Dhanpat Rai publication.
4. Text book of Environmental Studies-Erach Bharucha-UGC, Universities Press.

REFERENCE BOOKS:

1. Building Design and Drawing-Shah, Kale and Patki. TATA McGraw Hill.
2. Introduction to Surveying-Anderson-McGraw-Hill International Student Edition.
3. A Basic Course in Environmental Studies - S. Deswal and A. Deswal, Dhanpat Rai Publications, Delhi.

Engineering Graphics – I (102006)

Teaching Scheme		**Examination Scheme**
Lectures	3 Hours/Week	**Theory** – 100 Marks (4 Hours)
Practical	2 Hours/Week	

NOTE – Only **FIRST ANGLE METHODS OF PROJECTIONS ARE TO BE USED IN ALL THE UNITS.**

SECTION – I

UNIT – I Drafting Technology and Introduction to Any Drafting Software/Package

Layout of drawing sheets, sizes of drawing sheets, different types of lines used in drawing practice, Dimensioning – linear, angular, aligned system, unidirectional system, parallel dimensioning, chain dimensioning, location dimension and size dimension. Tolerances – methods of representing tolerances, unilateral and bilateral tolerances, tolerance on linear and angular dimensions, geometrical tolerances. Symbols used on drawing, surface finish symbols, welding symbols.

Advantages of using Computer Aided Drafting (CAD) packages, applications of CAD, basic operation of drafting packages, use of various commands for drawing, dimensioning, editing, modifying, saving and printing/plotting the drawings. Introduction to 3D primitives.

UNIT – II Curves used in Engineering Practice [15 Marks]

Ellipse, Parabola, Hyperbola, normal and tangents to these curves, Involute, Cycloid, Epi-cycloid, Hypo-cycloid, Archimedean Spiral, Helix on cone and cylinder.

UNIT – III Orthographic Projections [20 Marks]

Reference planes, types of orthographic projections – First angle projections, Third angle projections, methods of obtaining orthographic views by First angle method, Sectional orthographic projections – full section, half section, offset section.

UNIT – IV Auxiliary Projections [15 Marks]

Auxiliary planes – Auxiliary Vertical Plane (AVP), Auxiliary Inclined Plane (AIP), symmetrical auxiliary view, unilateral auxiliary view, bilateral auxiliary view.

SECTION – II

UNIT – V Isometric Projections [20 Marks]

Isometric view, Isometric scale to draw Isometric projection, Non-Isometric lines, construction of Isometric view from given orthographic views and to construct Isometric view of a Pyramid, Cone, Sphere.

UNIT – VI Interpretation of Given Views/Missing Views [20 Marks]

Identification of lines/edges and surfaces, visualization of given orthographic views, adding a missing/third view, adding a sectional view, to convert a given view in to a sectional view.

UNIT – VII Freehand Sketching [10 Marks]

Free hand sketching -- FV and TV of standard machine parts – Hexagonal headed nut and bolt, foundation bolts, shafts, keys, couplings, springs, screw thread forms, welded joints, riveted joints.

Term Work :

Five A2 (594X420mm) (Half imperial) size drawing sheet as detailed below :

Sheet No. 1 : CURVES
To draw any four curves mentioned in the detailed syllabus.
Sheet No. 2 : ORTHOGRAPHIC VIEWS
To draw two principal views, one sectional view for two objects.
Sheet No. 3 : AUXILIARY VIEWS
To draw auxiliary views from the given views for any two objects.
Sheet No. 4 : ISOMETRIC VIEWS
Two problems on Isometric views.
(minimum one problem by using CAD software/package)
Sheet No. 5 : INTERPRETATION OF GIVEN VIEWS/MISSING VIEWS
Two problems on Interpretation of given views.
(minimum one problem by using CAD software/package)

Text Books *:*

1. N.D. Bhatt, Elementary Engineering Drawing, Chartor Publishing house, Anand, India.
2. D. N. Johle, Engineering Drawing, Tata Mcgraw-hill Publishing Co. Ltd..

Reference Books *:*

1. P.S. Gill, Engineering Graphics.
2. N.D. Bhatt, Machine Drawing, Chartor Publishing house, Anand, India.
3. Warren J. Luzzader, Fundamentals of Engineering Drawing, Prentice Hall of India, New Delhi.
4. Fredderock E. Giesecke, Alva Mitchell & others, Principles of Engineering Graphics, Maxwell McMillan Publishing