Bharath Postgraduate College
In collaboration with

KARANATAKA STATE OPEN UNIVERSITY

Manasagangotri, Mysore – 570006,

B.Tech IN CIVIL ENGINEERING

SEMESTER SYSTEM

SYLLABUS

I YEAR SYLLABUS

(Basic Engineering)
(Common to all Branches)

Subject Code	Subject Title	Max marks	Max Credits
Semester-I			
BE1001	English-I	100	2
BE1002	Mathematics-I	100	2
BE1003	Engineering Physics-I	100	2
BE1004	Engineering Chemistry-I	100	2
BE1005	Fundamentals of Computing and Programming	100	3
BE1006	Physics & Chemistry Laboratory	100	2
BE1007	Computer Application Lab – I	100	2
Semester -II			
BE 2001	Technical English	100	2
BE 2002	Mathematics-II	100	2
BE 2003	Engineering Physics-II	100	2
BE2004	Engineering Chemistry-II	100	2
BE 2005	Engineering Graphics	100	3
BE 2006	Computer Application Lab – II	100	2
BE 2007	Engineering Practices Laboratory	100	2

Civil Engineering
III Semester

Subject Code	Subject Title	Max marks	Max Credits
CE 3001	Mathematics – III	100	**2**
CE 3002	Mechanics of Solids	100	**3**
CE 3003	Construction Techniques	100	**3**
CE 3004	Surveying– I	100	**3**
CE 3005	Basic Electrical and Electronics Engineering	100	**3**
CEP 001	Survey Practical – I	100	**2**
CEP 002	Computer Aided Building Drawing	100	**2**

IV Semester

Subject Code	Subject Title	Max marks	Max Credits
CE 4001	Numerical Methods	100	**2**
CE 4002	Strength of Materials	100	**3**
CE 4003	Industrial Hydraulic Engineering	100	**3**
CE 4004	Highway Engineering	100	**3**
CE 4005	Mechanics of Fluids	100	**2**
CEP 003	Strength of Materials Lab	100	**2**
CEP 004	Hydraulic Engineering Laboratory	100	**2**

V Semester

Subject Code	Subject Title	Max marks	Max Credits
CE 5001	Surveying – II	100	**3**
CE 5002	Environmental Engineering	100	**3**
CE 5003	Foundation Engineering	100	**3**
CE 5004	Railways, Docks & Harbours and Airports	100	**3**
CE 5005	Water Resources Engineering	100	**2**
CEP 005	Environmental Engineering Laboratory	100	**2**
CEP 006	Survey Practical – II	100	**2**

VI Semester

Subject Code	Subject Title	Max marks	Max Credits
CE 6001	Irrigation Engineering	100	**3**
CE 6002	Structural Analysis	100	**3**
CE 6003	Construction Planning & Scheduling	100	**3**
CE 6004	Principles of Management	100	**3**
CE 6005	Industrial Waste Management	100	**3**
CEP 007	Irrigation Engineering Drawing	100	**2**
CEP 008	Environmental Engineering Drawing	100	**2**

VII Semester

Subject Code	Subject Title	Max marks	Max Credits
CE 7001	Estimation and Quantity Surveying	100	**3**
CE 7002	Building Services	100	**2**
CE 7003	Design of Steel Structures	100	**2**
	Elective – I	100	**3**
	Elective – II	100	**3**
CEP 009	Computer Aided Design and Drafting Laboratory	100	**2**
CEP 010	Design Project	100	**2**

VIII Semester

Subject Code	**Subject Title**	**Max marks**	**Max Credits**
CE 8001	Engineering Economics and Cost Analysis	100	**3**
	Elective – III	100	**3**
	Elective – IV	100	**3**
CEP 011	Survey Camp	100	**2**
CEP 012	Project Work	300	**6**

Total Marks = 5600
Total Credits = 136

Elective Subjects

Subject Code	Subject Title
CEE 001	Electronic Surveying
CEE 002	Total Quality Management
CEE 003	Intellectual Property Rights (IPR)
CEE 004	Housing Planning & Management
CEE 005	Management of Irrigation Systems
CEE 006	Traffic Engineering Management
CEE 007	Coastal Zone Management
CEE 008	Air Pollution Management

SEMESTER : I
Subject Code : BE 1001
Subject Title : English - I
Structure of the Course Content

BLOCK 1 Focus on Language (Grammar)

Unit 1: Prefixes, Suffixes and Synonyms & Antonyms
Unit 2: Framing of Questions and Subject Verb and Agreement
Unit 3: Five Major Pattern and Voice
Unit 4: Preposition, Phrasal Verbs and Use of Conditionals

BLOCK 2 Reading

Unit 1: Skimming the Text
Unit 2: Scanning the Text
Unit 3: Note Making
Unit 4: Comprehension

BLOCK 3 Writing

Unit 1: Definition
Unit 2: Description
Unit 3: Process Description
Unit 4: Formal and Informal Letter Writing

BLOCK 4 Listening

Unit 1: Extensive Listening
Unit 2: Intensive Listening
Unit 3: Note Making
Unit 4: Inferential Comprehension

BLOCK 5 Speaking

Unit 1: Developing Confidence & Introducing One self
Unit 2: Describing Objectives
Unit 3: Analysing Problem & Providing Solutions
Unit 4: Expressing Opinions and giving instruction

Books:

1. A.S.Hornby, 'The advanced learners Dictionary of current English', Oxford university
2. Longman Basic English dictionary Ist Edition Pearson Longman
3. Department of Humanities and Social Sciences, Anna University, English for Engineers and Technologists, Vol.1, 2nd Edition, Orient Longman Ltd., 2002.
4. Chellammal, V., Learning to Communicate: A Resource Book for Scientists and Technologists, Allied Pub. Pvt. Ltd., Chennai, 2003.
5. Sharon J. Gerson, Steven M. Gerson, Technical Writing – Process and Product, 3rd Edition, Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2004.
6. Vocabulary in Practice - Part 1 to 4 by Glennis Pye, Cambridge University Press,
7. Learn Correct English by Shiv K. Kumar & Hemalatha Nagarajan, Pearson Longman,
8. Essential English Grammar by Raymond Murphy, Cambridge University Press.
9. Common Errors in English by M.Thomas, Lotus Press, New Delhi, 2006
10. Basic English Usage by Michael Swan, ELBS/OUP, 1989

SEMESTER : I
Subject Code : BE 1002
Subject Title : Mathematics - I
Structure of the Course Content

BLOCK 1 Matrices

Unit 1: Rank of a matrix – Consistency of linear system of equations
Unit 2: Eigen value problem
Unit 3: Cayley –Hamilton theorem
Unit 4: Orthogonal matrices – Orthogonal transformation of a symmetric Matrix

BLOCK 2 Three Dimensional Analytical Geometry

Unit 1: Direction cosines and ratios – Angle between two lines
Unit 2: Equations of a plane – Equations of a straight line – Coplanar lines
Unit 3: Shortest distance between skew lines – Sphere – Tangent plane
Unit 4: Plane section of a sphere – Orthogonal spheres

BLOCK 3 Geometrical Applications Of Differential Calculus

Unit 1: Curvature – Cartesian and polar co-ordinates
Unit 2: Centre and radius of curvature
Unit 3: Circle of curvature
Unit 4: Involutes and evolutes – Envelopes

BLOCK 4 Functions Of Several Variables

Unit 1: Functions of two variables – Partial derivatives – Total differential
Unit 2: Taylor's expansion, Maxima and minima
Unit 3: Lagrange's Multiplier method – Jacobians
Unit 4: Differentiation under integral sign.

BLOCK 5 Ordinary Differential Equations

Unit 1: Simultaneous first order linear equations with constant coefficients
Unit 2: Linear equations of second order with constant and variable coefficients
Unit 3: Homogeneous equations of Euler type
Unit 4: Equations reducible to homogeneous form, Method of variation of Parameters

Books:

1. Veerarajan,T., "Engineering Mathematics," Second Edition , Tata McGraw–Hill Pub. Co.
2. Venkataraman, M.K., "Engineering Mathematics, Volume I," Fourth Edition, The National Pub. Co., Chennai, 2003.
3. Kreyszig, E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley and Sons (Asia) Ltd., Singapore, 2001.
4. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publish.
5. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics" Volume I, Fourth Revised Edition, S. Chand & Co., New Delhi, 2000.
6. Widder, D.V. "Advanced Calculus", Second Edition, Prentice Hall of India, New Delhi,
7. Engineering Mathematics Vol-III by Dr. B. Krishna Gandhi , Dr. T.K.V Iyengar, S.Ranganatham, , S.Chand & Co, New Delhi
8. Introduction to Engineering Mathematics by H.K. Dass, Dr.Rama Verma, S.Chand & Co,
9. Applied Engineering Mathematics Vol-II by H.K.Dass, S.Chand & Co.
10. Advanced Engineering Mathematics by N.Bali,M.Goyal,C.Watkins, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : I
Subject Code : BE 1003
Subject Title : Engineering Physics - I

Structure of the Course Content

BLOCK 1 Acoustics and Ultrasonic

Unit 1: Sound and Weber Fechner law
Unit 2: Factors affecting acoustics of buildings
Unit 3: Ultrasonic production
Unit 4: SONAR, Measurement of velocity of blood flow & movement of heart

BLOCK 2 Crystallography & Non-Destructive Testing

Unit 1: Space lattice, unit cell, Bravais space lattices, Lattice planes
Unit 2: Miller indices Calculation of number of atoms per unit cell, Atomic Radius
Unit 3: coordination number & packing factor for simple cubic
Unit 4: NDT methods

BLOCK 3 Wave Optics

Unit 1: Air wedge and testing of flat surfaces
Unit 2: Michelson interferometer, Types of fringes
Unit 3: Theory of plane and Photo elasticity
Unit 4: Isoclinic and iso-chromatic fringes – Photo elastic bench

BLOCK 4 Quantum Physics

Unit 1: Planck's quantum theory of black body radiation, Photo electric effect
Unit 2: Compton effect
Unit 3: Schrödinger wave equation
Unit 4: Physical significance of wave function & electrons in a metal

BLOCK 5 Laser & Fibre Optics

Unit 1: Einstein's coefficients and Laser
Unit 2: Material processing, CD-ROM & Holography
Unit 3: Optical fibre
Unit 4: Fibre optics communication system

Books:

1. Rajendran V. and Marikani A., Applied Physics for Engineers, 3rd Edition, Tata McGraw–Hill Publishing Company Limited, New Delhi, 2003.
2. Arumugam M., Engineering Physics, 5th Edition, Anuradha Agencies, Kumbakonam,
3. Palanisamy P.K., Physics for Engineers, Vol.1 & Vol.2, 2nd Edition, Scitech Publications,
4. Gaur R.K. and Gupta S.L., Engineering Physics, 8th edition, Dhanpat Rai Publications
5. Uma Mukherji, Engineering Physics, Narosa Publishing House, New Delhi, 2003.
6. Modern Engineering Physics by A.S.Vasudeva, S. Chand Publishers, New Delhi
7. Engineering Physics Fundamentals & Modern Applications by P.Khare and A.Swarup, Lakshmi Publications (Pvt) Ltd, New Delhi
8. Engineering Physics by Dipak Chandra Ghosh,Nipesh Chandra chosh,Prabir Kumar Haldar, Lakshmi Publications (Pvt) Ltd, New Delhi
9. Engineering Physics by Vikram Yadav, Tata McGraw Hill, New Delhi
10. Schaum's Outline of Physics for Engineering and Science by Michael Browne, Tata

SEMESTER : I
Subject Code : BE 1004
Subject Title : Engineering Chemistry - I
Structure of the Course Content

BLOCK 1 Electro Chemistry

Unit 1: Galvanic cells – reversible and irreversible cells
Unit 2: Single electrode potential, standard electrodes, electrochemical series
Unit 3: Nernst equation and Metal
Unit 4: Glass electrode, concentration cells and Kohlrausch law

BLOCK 2 Thermodynamics

Unit 1: Thermodynamic terms – definition of system
Unit 2: Thermodynamic equilibrium
Unit 3: Law of thermodynamics
Unit 4: Entropy of phase transitions, Gibbs Helmholtz equation

BLOCK 3 Chemical Kinetics

Unit 1: Kinetics of second order reaction
Unit 2: Kinetics of opposing, parallel and consecutive reactions
Unit 3: Decomposition of diethyl ether in gaseous phase – radioactive decay of polonium
Unit 4: Effect of temperature on reaction rate – theory of absolute reaction rate

BLOCK 4 Surface Chemistry And Catalysis

Unit 1: Adsorption
Unit 2: Freundlich, Langmuir isotherms
Unit 3: Catalysis
Unit 4: Michaelis – Menton equation – acid base catalysis

BLOCK 5 Spectroscopy

Unit 1: Electromagnetic spectrum
Unit 2: Electronic transition, Vibrational transition and rotational transition
Unit 3: Lambert's Law –colorimetric analysis – estimation of concentration of a solution by colorimetry
Unit 4: Visible & UV spectroscopy, IR spectroscopy

Books:

1. Puri B.R., Sharma L.R. and Madan S. Pathania, Principles of Physical Chemistry, Shoban Lal Nagin Chand & Co., Jalandhar, 2000.
2. Jain P.C and Renuka Jain, Physical Chemistry for Engineers, Dhanpat Rai & Sons, Delhi
3. Bahl B.S., Tuli G.D., and Arun Bahl, Essentials of Physical Chemistry, S.Chand& Co.
4. Kuriacose J.C. & Rajaram J, Chemistry in Engineering & Technology, Vol. 1, Tata McGraw
5. Introduction to Engineering Chemistry by Minaxi B Lohani, Upma Misra, S.Chand & Co, New
6. Engineering Chemistry by Dr.A.K.Pahari,Dr.B.S.Chauhan, Lakshmi Publications (Pvt) Ltd,
7. Advanced Engineering Chemistry by M.Senapati, Lakshmi Publications (Pvt) Ltd, New Delhi
8. Engineering chemistry by Uppal , Khanna publishers
9. Environmental chemistry &Pollution control by Dara .SS, S. Chand&co
10. Environmental Pollution by, Tripathy .SN , Sunakar panda - Vrinda publication

SEMESTER : I
Subject Code : BE 1005
Subject Title : Fundamentals of Computing and Programming

Structure of the Course Content

BLOCK 1 Introduction to Computer

Unit 1: Introduction, Evaluation and generation of Computer
Unit 2: Classification of Computers
Unit 3: Basic Computer organization
Unit 4: Number Systems

BLOCK 2 COMPUTER ARITHMETIC AND SOFTWARE

Unit 1: Computer Codes
Unit 2: Computer Arithmetic
Unit 3: Computer Software
Unit 4: Logical System Architecture – Software Development Steps

BLOCK 3 PROBLEM SOLVING AND OFFICE AUTOMATION

Unit 1: Planning the Computer Program – Purpose
Unit 2: Algorithm – Flow Charts – Pseudocode
Unit 3: Application Software Packages- Word Processing – Spreadsheet
Unit 4: Graphics – Personal Assistance.

BLOCK 4 INTRODUCTION TO C

Unit 1: Overview of C – Constants, Variables and Data Types
Unit 2: Operators and Expression – Managing Input and Output Operators
Unit 3: Decision Making and Branching
Unit 4: Decision Making and Looping

BLOCK 5 FUNCTIONS AND POINTERS

Unit 1: Arrays – Handling of Character Strings
Unit 2: User-Defined Functions- Structures and Unions
Unit 3: Pointers
Unit 4: Developing a C Programs

Books:

1. Pradeep K.Sinha and Priti Sinha, “Computer Fundamentals: Concepts, Systems and Applications”, BPB Publications, 2003.
2. E.Balagurusamy, “Programming in ANSI C”, TMH, New Delhi, 2002.
3. Allen B.Tucker et.al, “Fundamentals of Computing I”, TMH New Delhi, 1998.
4. V.Rajaraman, “Fundamentals of Computers”, Prentice-Hall of India, 2002.
5. Herbert Schidt, “C Made Easy”, McGraw-Hill.

SEMESTER : I
Subject Code : BE 1006
Subject Title : Physics & Chemistry Laboratory
Structure of the Course Content

Practical

List of Experiments for Physics

1. Torsional Pendulum – determination of rigidity modulus of wire and moment of inertia of disc.
2. Non Uniform Bending - Young modulus determination
3. Viscosity –Determination of co-efficient of Viscosity of liquid by Poiseuilles flow
4. Lee's disc – Determination of thermal conductivity of a bad conductor
5. Air wedge – Determination of thickness of a thin wire
6. Newton rings – Determination of Focal length of a lens
7. Spectrometer – Dispersive power of a prism
8. Determination of wavelength of Laser using Grating and Particle size determination.

List of Experiments Chemistry

I. Weighing and preparation of standard solutions

1. Preparation of molar and normal solutions of the following substances - oxalic acid, sodium carbonate, sodium hydroxide, hydrochloric acid.
2. Preparation of buffer solutions: borate buffer, phosphate buffer using Henderson equation.

II. Water Analysis

1. Determination of total hardness, temporary & permanent hardness of water by EDTA method.
2. Determination of DO content by Winkler's method.
3. Determination of alkalinity in a water sample.
4. Determination of chloride content of water sample by argentometric method.

III. Conductometry

1. Conduct metric titration of mixture of acids.
2. Conduct metric precipitation titration using $BaCl_2$ – Na_2SO_4.

SEMESTER : I
Subject Code : BE 1007
Subject Title : Computer Application Lab - I
Structure of the Course Content

Practical

MS-OFFICE

a) Word Processing

1. Document creation, Text manipulation with Scientific notations.
2. Table creation, Table formatting and Conversion.
3. Mail merge and Letter preparation.
4. Drawing - flow Chart

b) Spread Sheet

1. Chart - Line, XY, Bar and Pie.
2. Formula - formula editor.
3. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
4. Sorting and Import / Export features.

C Programming

1. Data types, Expression Evaluation, Condition Statements.
2. Functions, Recursion and parameter passing mechanisms.
3. Arrays
4. Structures and Unions
5. Pointers and Functions
6. File Processing
7. Dynamic allocation & Linked List

SEMESTER : II
Subject Code : BE 2001
Subject Title : Technical English
Structure of the Course Content

BLOCK 1 Focus on Language

Unit 1: Cause and Effect Expression
Unit 2: Connectives & Imperative and Modal Verbs
Unit 3: Infinitives, Gerunds and Reporting Verbs
Unit 4: Varied Grammatical Functions of the same word

BLOCK 2 Reading

Unit 1: Reading Comprehension
Unit 2: Guided note Making
Unit 3: Evaluating the style
Unit 4: Cloze Reading

BLOCK 3 Writing

Unit 1: Formal Letter Writing
Unit 2: Technical Report
Unit 3: Industrial Report
Unit 4: Project Proposal

BLOCK 4 Listening

Unit 1: Listening for global Comprehension and Specification information
Unit 2: Listening to speech Segments
Unit 3: Listening to recorded telephonic conversation
Unit 4: Listening to Short and Long conversion

BLOCK 5 Speaking

Unit 1: Activities related to professional skills
Unit 2: Role plays activities and Conversational etiquette
Unit 3: Group discussion & Mock interview
Unit 4: Academic skills

Books:

1. A.S.Hornby, 'The advanced learners Dictionary of current English', Oxford university press.
2. Longman Basic English dictionary Ist Edition Pearson Longman
3. Department of Humanities and Social Sciences, Anna University, English for Engineers and Technologists, Vol.2, Orient Longman Ltd., 2002, 2nd Edition.
4. T M Farhathullah, Communication Skills for Technical Students, Orient Longman Ltd., 2002.
5. Andrea J. Rutherford, Basic Communication Skills for Technology, 1st Edn., Pearson Education Asia (Singapore) Pvt. Ltd., Bangalore, 2001.
6. Vocabulary in Practice - Part 1 to 4 by Glennis Pye, Cambridge University Press,
7. Learn Correct English by Shiv K. Kumar & Hemalatha Nagarajan, Pearson Longman,
8. Essential English Grammar by Raymond Murphy, Cambridge University Press.
9. Common Errors in English by M.Thomas, Lotus Press, New Delhi, 2006
10. Basic English Usage by Michael Swan, ELBS/OUP, 1989

SEMESTER : II
Subject Code : BE 2002
Subject Title : Mathematics - II
Structure of the Course Content

BLOCK 1 Multiple Integrals

Unit 1: Double integration – Cartesian and polar coordinates
Unit 2: Change of order of integration – Area as a double integral
Unit 3: Triple integration in Cartesian coordinates
Unit 4: Change of variables between Cartesian and polar coordinates

BLOCK 2 Vector Calculus

Unit 1: Gradient, divergence and curl
Unit 2: Line, surface and volume integrals
Unit 3: Green's, Gauss divergence
Unit 4: Stoke's theorems

BLOCK 3 Analytic Functions

Unit 1: Function of a complex variable – Analytic function
Unit 2: Cauchy, Riemann equations in Cartesian coordinates
Unit 3: Determination of harmonic conjugate by Milne – Thomson method
Unit 4: Conformal mapping and bilinear transformation.

BLOCK 4 Complex Integration

Unit 1: Cauchy's theorem and Cauchy's integral formula
Unit 2: Taylor and Laurent expansion – Singularities
Unit 3: Residues – Cauchy's residue theorem
Unit 4: Contour integration – Unit circle and semi-circular contours

BLOCK 5 Laplace Transform

Unit 1: Transforms of elementary functions – Basic properties
Unit 2: Inverse transforms
Unit 3: Derivatives and integrals of transforms
Unit 4: Convolution theorem – Transform of periodic functions

Books:

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Delhi,
2. Kreyzig, E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley & Sons
3. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., "Advanced Mathematics for Engineering Students", Volumes I and III, S. Viswanathan (Printers and Publishers)
4. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna, Delhi,
5. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics" Volume II, Fourth Revised Edition, S. Chand & Co., New Delhi, 2000.
6. Widder, D.V. "Advanced Calculus", Second Edition, Prentice Hall of India, New Delhi,
7. Engineering Mathematics Vol-III by Dr. B. Krishna Gandhi , Dr. T.K.V Iyengar, S.Ranganatham, , S.Chand & Co, New Delhi
8. Veerarajan,T., "Engineering Mathematics (for First Year)," Second Edition ,Tata Mc Hill
9. Venkataraman, M.K., "Engineering Mathematics, Volume II," Fourth Edition, The National Pub. Co., Chennai, 2003.
10. Kreyszig, E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley and

SEMESTER : II
Subject Code : BE 2003
Subject Title : Engineering Physics - II

Structure of the Course Content

BLOCK 1 Crystal Defects

Unit 1: Crystal imperfection – point defects-line defects
Unit 2: Dislocations
Unit 3: Burger Vector – Dislocation climb
Unit 4: Strengthening mechanisms for the improvement of mechanical Properties

BLOCK 2 Conducting and Semi conducting Materials

Unit 1: Drawbacks of classical theory- Fermi distribution function
Unit 2: Origin of band gap in solids, Concept of effective mass of electron and hole
Unit 3: Types of Semiconductor
Unit 4: Hall effect

BLOCK 3 Magnetic and Dielectric Materials

Unit 1: Origin of magnetic moment – Bohr magneton
Unit 2: Weiss theory of Para magnetism, Determination of paramagnetic Substance
Unit 3: Ferromagnetism, Anti-ferromagnetic materials and Ferrites magnetic
Unit 4: Storage of magnetic data

BLOCK 4 Nuclear Physics

Unit 1: Nuclear forces – Einstein's mass energy relation– binding energy
Unit 2: Nuclear fission
Unit 3: Nuclear reactor
Unit 4: Nuclear power station

BLOCK 5 New Engineering Materials

Unit 1: Superconducting
Unit 2: Meissner effect, Isotope effect
Unit 3: Magnetic levitation and SQUIDS - Metallic glasses
Unit 4: Nano phase materials

Books:

1. Arumugam M, Materials Science, 3rd Edition, Anuradha Agencies, Kumbakonam, 2003.
2. Srivastava C.M. and Srinivsan C, Science of Engineering Materials, 2nd Edition, New Age International (P) Ltd, Publications, New Delhi, 1997.
3. Rajendran V. and Marikani A., Applied Physics for Engineers, 3rd Edition, Tata McGraw.
4. Palanisamy, P.K., Materials Science, 2nd Edition, Scitech Publications (India), Pvt. Ltd.,
5. Murthy V.S.R., Jena AK, Gupta K.P. and Murthy G.S., Structure and Properties of Engineering Materials, Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2003.
6. Kenneth G. Budinski, Michel K. Budinski, Engineering Materials Properties and Selection, 7th Edition, Pearson, Singapore (Prentice Hall), 2002.
7. Vasudeva A.S., Modern Engineering Physics, 2nd Edition, S.Chand & Co. Ltd., Delhi.
8. Modern Engineering Physics by A.S.Vasudeva, S. Chand Publishers, New Delhi
9. Engineering Physics Fundamentals & Modern Applications by P.Khare and A.Swarup, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Engineering Physics by Dipak Chandra Ghosh,Nipesh Chandra chosh, Prabir Kumar

SEMESTER : II
Subject Code : BE 2004
Subject Title : Engineering Chemistry - II
Structure of the Course Content

BLOCK 1 Fuels And Combustion

Unit 1: Classification of fuels
Unit 2: Coal varieties, coke and cracking
Unit 3: Synthetic petrol and Fischer
Unit 4: Gaseous fuels

BLOCK 2 Mechanical Engineering Materials

Unit 1: Abrasives
Unit 2: Refractories
Unit 3: Lubricants
Unit 4: Polymer blends and alloys

BLOCK 3 Water Technology And Corrosion

Unit 1: Corrosion
Unit 2: Sacrificial anode - boiler feed water
Unit 3: Boiler compounds – caustic embrittlement – boiler corrosion
Unit 4: Priming and foaming – desalination by reverse osmosis

BLOCK 4 Phase Rule And Physical Metallurgy

Unit 1: Phase rule
Unit 2: Thermal analysis
Unit 3: Physical metallurgy - powder metallurgy
Unit 4: Mixing and blending – compacting – sintering

BLOCK 5 Analytical Techniques

Unit 1: Gravimetry analysis of Pb, Fe, Al, and Ni - complex metric titrations
Unit 2: Estimation of Ni, Zn, and Mg - redox titrations
Unit 3: Estimation of iron by dichrometry and copper by iodometry
Unit 4: Atomic absorption spectroscopy, quantitative estimation of Ni and Cr.

Books:

1. Jain P.C. and Monika Jain, Engineering Chemistry, Dhanpat Rai Pub. Co. (P) Ltd., New Delhi, Edition 2002.
2. Dara S.S., A text book of Engineering Chemistry, S. Chand Co. (P) Ltd., New Delhi, 2003.
3. Vogel A.I., A text book Quantitative Inorganic Analysis, ELBS, London, 2000.
4. Engineering chemistry by Uppal , Khanna publishers
5. Environmental chemistry &Pollution control by Dara .SS, S. Chand&co.
6. Environmental Pollution by . Tripathy .SN , Sunakar panda - Vrinda publication
7. Rain water Harvesting-hand book by Chennai Metro Water
8. Introduction to Engineering Chemistry by Minaxi B Lohani, Upma Misra, S.Chand & Co, New Delhi
9. Engineering Chemistry by Dr.A.K.Pahari,Dr.B.S.Chauhan, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Advanced Engineering Chemistry by M.Senapati, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : II
Subject Code : BE 2005
Subject Title : Engineering Graphics
Structure of the Course Content

BLOCK 1 Projection of Points, Lines And Surfaces

Unit 1: General principles of presentation of technical drawings as per BIS
Unit 2: First angle projection. And Orthographic projection of points
Unit 3: Projections of straight lines located in first quadrant only
Unit 4: Projections of plane surfaces like polygonal lamina and circular lamina

BLOCK 2 Projections of Solids

Unit 1: Projection of simple prism
Unit 2: Projection of simple pyramid
Unit 3: Projection of simple cylinder
Unit 4: Projection of simple cone

BLOCK 3 Sections of Solids and Development

Unit 1: Sectioning of simple prisms
Unit 2: Sectioning of simple pyramids
Unit 3: Sectioning of simple cylinder
Unit 4: Sectioning of simple cone and sphere

BLOCK 4 Pictorial Projections

Unit 1: Isometric views of simple truncated prisms
Unit 2: Isometric views of pyramids
Unit 3: Isometric views of cylinders
Unit 4: Isometric views of cones

BLOCK 5 Free-Hand Sketching

Unit 1: Free hand sketching techniques
Unit 2: sketching of orthographic views
Unit 3: Hand dimensioning.
Unit 4: Sketching pictorial views from given orthographic views.

Books:

1. Nataraajan K.V, "Engineering Drawing and Graphics ", Private Publisher, Chennai.
2. Venugopal K., "Engineering Graphics", New Age International (P) Limited, 2002.
3. Bertoline and Wiebe, Fundamentals of Graphics Communication, Third edition, McGraw-
4. Warren J. Luzadder and Jon. M.Duff, "Fundamentals of Engineering Drawing", Prentice Hall of India Pvt. Ltd., Eleventh Edition, 2001.
5. Gopalakirishna K.R., "Engineering Drawing (Vol. I & II)", Subhas Publications, 1998.
6. Engineering Drawing by Shah/Rana,Ist Edition Pearson Longman
7. Machine Drawing with AutoCAD by Pohit/Ghosh, Ist Edition Pearson Longman
8. Engineering Graphics by Prof.P.J.Shah, S.Chand & Co, New Delhi

Standards :

1. IS 10711 - 2001 Technical Product Documentation - Sizes of drawing sheets
2. IS 9609 - 1983 Lettering on technical drawings
3. IS 10714 - 1983 General Principles of presentation of technical drawings
4. IS 11669 - 1986 General Principles of dimensioning of technical drawings

SEMESTER : II
Subject Code : BE 2006
Subject Title : Computer Application Lab - II
Structure of the Course Content

Practical

1. UNIX COMMANDS

(i) Study of Unix OS - Basic Commands - Process Management Commands - Unix Editor

2. SHELL PROGRAMMING

(i) Simple Shell program - Conditional Statements - Testing and Loops

(ii) Commands line substitution

3. C PROGRAMMING AND FILE MANAGEMENT

(i) C Program to implement Unix Commands

4. PROCESS MANAGEMENT AND SIGNAL HANDLING

(i) Programs in C for signal handling and Process management

SEMESTER : II
Subject Code : BE 2007
Subject Title : Engineering Practices Laboratory
Structure of the Course Content

Practical

1. CIVIL ENGINEERING PRACTICE

Plumbing

Basic pipe connections involving the fittings like valves, taps

Wood Work

Sawing, planing, making common joints: T-Joint, Dovetail joint.

2. ELECTRICAL ENGINEERING PRACTICE

Basic household wiring using switches, fuse, indicator-lamp, Tube Light

3. MECHANICAL ENGINEERING PRACTICE

Welding

Arc welding of butt joints, lap joints, tee joints.

Basic Machining

Simple turning, and drilling operations

4. ELECTRONIC ENGINEERING PRACTICE

Soldering simple electronic circuits and checking continuity

SEMESTER : III
Subject Code : CE 3001
Subject Title : Mathematics - III
Structure of the Course Content

BLOCK 1 PARTIAL DIFFERENTIAL EQUATIONS

Unit 1: Formation of partial differential equations
Unit 2: Solution of standard types of first order partial differential equations
Unit 3: Lagrange's linear equation
Unit 4: Linear partial differential equations of second and higher order

BLOCK 2 Fourier Series

Unit 1: General Fourier series – Odd and even functions
Unit 2: Half range Sine and Cosine series
Unit 3: Complex form of Fourier series
Unit 4: Parseval's identify and Harmonic Analysis

BLOCK 3 Boundary value problems

Unit 1: Second order quasi linear partial differential equations
Unit 2: One dimensional wave and heat equation
Unit 3: Steady state solution of two-dimensional heat equation
Unit 4: Fourier series solutions in Cartesian coordinates

BLOCK 4 Fourier Transform

Unit 1: Fourier integral theorem (without proof) and Fourier transform pair
Unit 2: Sine and Cosine transforms – Properties
Unit 3: Transforms of simple functions
Unit 4: Convolution theorem and Parseval's identity

BLOCK 5 Z -Transform and Difference Equations

Unit 1: Z-transform - Elementary properties
Unit 2: Inverse Z – transform
Unit 3: Convolution theorem
Unit 4: Formation of difference equations

Books:

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics Volume III", S. Chand & Company ltd., New Delhi, 1996.
3. Wylie C. Ray and Barrett Louis, C., "Advanced Engineering Mathematics", Sixth Edition, McGraw-Hill, Inc., New York, 1995
4. Andrews, L.A., and Shivamoggi B.K., "Integral Transforms for Engineers and Applied Mathematicians," Macmillen , New York ,1988.
5. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., "Advanced Mathematics for Engineering Students", Volumes II and III, S. Viswanathan (Printers and Publishers) Pvt. Ltd. Chennai, 2002.
6. Churchill, R.V. and Brown, J.W., "Fourier Series and Boundary Value Problems", Fourth Edition, McGraw-Hill Book Co., Singapore, 1987

SEMESTER : III
Subject Code : CE 3002
Subject Title : Mechanics of Solids
Structure of the Course Content

BLOCK 1 Stress Strain and Deformation of Solids

Unit 1: Rigid bodies and deformable solids and Prosperities of Solids
Unit 2: Stresses – Strain, Elasticity
Unit 3: Deformation of simple and compound bars, shear modulus, bulk Modulus
Unit 4: biaxial state of stress and stress at a point, inclined plane and planes

BLOCK 2 Analyses of plane truss, thin cylinders / shells

Unit 1: Stability and equilibrium of plane frames and types of trusses
Unit 2: Analysis of forces in truss members
Unit 3: Cylinders and shells – under internal pressure
Unit 4: Deformation of thin cylinders and shells

BLOCK 3 Transverse Loading On Beams

Unit 1: Beams, Supports and Loads
Unit 2: Bending Moments, Shear forces
Unit 3: Theory of simple bending and analysis of stresses
Unit 4: Load carrying capacity of beams and proportioning of sections

BLOCK 4 Deflections of Beams and Shear Stresses

Unit 1: Deflection of beams, double integration method and Macaulay's Method
Unit 2: Slope and deflection
Unit 3: Variation of shear stress and shear stress distribution
Unit 4: Shear flow and shear centre

BLOCK 5 Torsion and springs

Unit 1: Stresses and deformation in circular
Unit 2: Stepped shafts – shafts fixed at both ends
Unit 3: Leaf springs – stresses in helical springs –
Unit 4: Deflection of springs

Books:

1. Egor P Popov, Engineering Mechanics of Solids, Prentice Hall of India, New Delhi, 2003
2. V. N. Vazirani, M.M. Ratwani, Analysis of Structures, Volume – 1, Khanna Publishers, New Delhi
3. Kazimi S.M.A, Solid Mechanics, Tata McGraw-Hill Publishing Co, New Delhi, 2003.
4. William Nash, Theory and Problems of Strength of Materials, Schaum's Outline Series, McGraw-Hill International Edition.
5. Srinath L.N, Advanced Mechanics of Solids, Tata McGraw-Hill Publishing Co., New Delhi, 2003

SEMESTER : III
Subject Code : CE 3003
Subject Title : Construction Techniques
Structure of the Course Content

BLOCK 1 Construction Practices

Unit 1: Specification, Site Clearance and Masonry
Unit 2: Flooring, Damp proof Courses and Joints
Unit 3: Building Foundation, Basement and Shed
Unit 4: Fabrication and erection of steel trusses and Frames

BLOCK 2 Sub Structure Constructions

Unit 1: Techniques of Box jacking and Pipe Jacking
Unit 2: Tunnelling techniques – Piling techniques-
Unit 3: Under water construction of diaphragm walls and basement
Unit 4: Dewatering and stand by Plant equipment for underground open Excavation

BLOCK 3 Super Structure Constructions

Unit 1: Launching girders, bridge decks, off shore platforms – special forms for Shells
Unit 2: Erecting light weight components and transmission towers
Unit 3: Construction sequences in cooling towers, silos, chimney, sky scrapers, Bow string bridges, cable stayed bridges
Unit 4: Techniques for heavy decks

BLOCK 4 Repairs and Rehabilitation

Unit 1: Support structure for heavy Equipment and Erection of articulated Structures
Unit 2: Study on causes of building damage and deterioration
Unit 3: Assessment of materials and methods of repair
Unit 4: Restoration

BLOCK 5 Construction Equipment

Unit 1: Selection of equipment for earth work and Earth work equipment
Unit 2: Equipment for foundation and pile driving
Unit 3: Equipment for compaction, batching and mixing and concreting
Unit 4: Equipment for material handling and erection of structures

Books:

1. Peurifoy, R.L., Ledbetter, W.B. and Schexnayder, C., "Construction Planning, Equipment and Methods", 5th Edition, McGraw Hill, Singapore, 1995.
2. Arora S.P. and Bindra S.P., Building Construction, Planning Techniques and Method of Construction, Dhanpat Rai and Sons, 1997
3. Jha J and Sinha S.K., Construction and Foundation Engineering, Khanna Publishers, 1993.
4. Sharma S.C. “Construction Equipment and Management”, Khanna Publishers New Delhi, 1988.
5. Deodhar, S.V. “Construction Equipment and Job Planning”, Khanna Publishers, New Delhi, 1988.
6. Dr. Mahesh Varma, “Construction Equipment and its Planning and Application”, Metropolitan Book Company, New Delhi-, 1983.

7. Building Construction by Gurucharan singh, Standard book house
8. Building Construction by S.P. Arora & S. P. Bindra, Dhanpat rai publications
9. Building Construction by S.C.Rangwala,,Charotar Publishing House
10. Civil Engineering Materials by TTTI Chandigarh, TMH

SEMESTER : III

Subject Code : CE 3004

Subject Title : Surveying– I

Structure of the Course Content

BLOCK 1 Introduction and Chain Surveying

Unit 1: Definition, Principles and Classification of Surveying
Unit 2: Survey instruments and adjustment
Unit 3: Ranging and chaining - Reciprocal ranging - Setting perpendiculars
Unit 4: Traversing, Plotting, Enlarging and reducing figures

BLOCK 2 Compass Surveying and Plane Table Surveying

Unit 1: Prismatic compass - Surveyor's compass - Bearing
Unit 2: Systems and conversions - Local attraction
Unit 3: Dip - Traversing - Plotting - Adjustment of errors
Unit 4: Plane table instruments and accessories

BLOCK 3 Levelling and Applications

Unit 1: Levels and Staves, Bench marks
Unit 2: Fly and check levelling - Booking - Reduction
Unit 3: Reciprocal levelling - Longitudinal and cross sections - Plotting
Unit 4: Contouring - Methods - Characteristics and uses of contours

BLOCK 4 Theodolite Surveying

Unit 1: Theodolite - Vernier and microptic
Unit 2: Temporary and permanent adjustments of vernier transit
Unit 3: Horizontal angles - Vertical angles - Heights and distances - Traversing
Unit 4: Closing error and distribution - Gale's tables

BLOCK 5 Engineering Surveys

Unit 1: Lay out - Setting out works - Route Surveys
Unit 2: Curve ranging - Horizontal and vertical curves - Simple curves
Unit 3: Compound and reverse curves - Transition curves
Unit 4: Mine Surveying - instruments - Tunnels

Books:

1. Bannister A. and Raymond S., Surveying, ELBS, Sixth Edition, 1992.

2. Kanetkar T.P., Surveying and Levelling, Vols. I and II, United Book Corporation, Pune, 1994.
3. Clark D., Plane and Geodetic Surveying, Vols. I and II, C.B.S. Publishers and Distributors, Delhi, Sixth Edition, 1971.
4. James M.Anderson and Edward M.Mikhail, Introduction to Surveying, McGraw-Hill Book Company, 1985.
5. Heribert Kahmen and Wolfgang Faig, Surveying, Walter de Gruyter, 1995.
6. Punmia B.C. Surveying, Vols. I, II and III, Laxmi Publications, 1989
7. Surveying and levelling part I & II by Kanetkar.T.P. & S.V.Kulkarni, Puna vidyarthi girha, Prakashan
8. Surveying Volume-1 & Volume-2 by Punmia.B.C, Laxmi Publications(p) Ltd
9. Surveying volume I & II by Duggal .S.K, Tata Mc Graw hill New Delhi
10. Surveying & Levelling by Rangwala.S.C, Charotar Publishing House

SEMESTER : III

Subject Code : CE 3005

Subject Title : Basic Electrical and Electronics Engineering

Structure of the Course Content

BLOCK 1 FUNDAMENTAL OF D.C AND A.C CIRCUITS

Unit 1: Definitions of DC Parameters and Basic Laws
Unit 2: Kirchoff's Law and Mesh Analysis's
Unit 3: Definitions of AC Components
Unit 4: RLC Circuits

BLOCK 2 D.C AND A.C MACHINES

Unit 1: DC Generator
Unit 2: DC Motor
Unit 3: Single Phase AC Motor
Unit 4: Three Phase AC Motor

BLOCK 3 Basic House Wiring

Unit 1: Wiring Equipments
Unit 2: Electrical Items Fitting Plan Preparation
Unit 3: Material Schedule Preparation with Cost Estimation
Unit 4: IE Rules

BLOCK 4 Basic Electronics

Unit 1: Semiconductor Technology
Unit 2: Diodes
Unit 3: Transistors
Unit 4: Regulators

BLOCK 5 Applications of Electronics Devices

Unit 1: Power Supply Unit
Unit 2: Inverter
Unit 3: Refrigerator
Unit 4: Commercial AC System

Books:

1. Electric Circuit Theory By Dr M. Arumugam, Dr N. Premkumar, Khanna Publishers
2. Electric Circuits By Joseph Edminister, Schaum Series
3. Principle of Electronics By VK Metha
4. Electronic Principles by Malvino, Tata MC Publishers
5. A Course in Electrical Engg (Vol II) By BL Theraja, S.Chnad Publishers
6. Electrical Technology By JB Gupta, S.K. Kataria & Sons
7. Electrical Machines by SK Bhattacharya, Tata Mc Hill Publishers

8. Power Electronics by MD Singh & KB Khanchandaniata Tata MC Hill
9. Fundamentals of Electrical Drives by GK Dubey, Narosa Publishing
10. Electrical Wiring, Estimating and Costing By Dr.S.L.Uppal, Khanna Publishers.
11. Electrical Design Estimating and Costing By K.B.Raina & S.K.Battacharya. New age international Publishers

SEMESTER : III

Subject Code : CEP 001

Subject Title : Survey Practical – I

Structure of the Course Content

Practical

1. Study of chains and its accessories
2. Aligning, Ranging and Chaining
3. Chain Traversing
4. Compass Traversing
5. Plane table surveying: Radiation
6. Plane table surveying: Intersection
7. Plane table surveying: Traversing
8. Plane table surveying: Resection –Three point problem
9. Plane table surveying: Resection – Two point problem
10. Study of levels and levelling staff
11. Fly levelling using Dumpy level and tilting level
12. Check levelling
13. LS and CS
14. Contouring

SEMESTER : III

Subject Code : CEP 002

Subject Title : Computer Aided Building Drawing

Structure of the Course Content

Practical

At the end of this course the student should be able to draft on computer building drawings (Plan, elevation and sectional views) in accordance with development and control rules satisfying orientation and functional requirements for the following:

1. Buildings with load bearing walls (Flat and pitched roof) – Including details of doors and windows
2. RCC framed structures
3. Industrial buildings – North light roof structures – Trusses
4. Perspective view of one and two storey buildings

SEMESTER : IV
Subject Code : CE 4001
Subject Title : Numerical Methods
Structure of the Course Content

BLOCK 1 Solution of Equations and Eigen value Problems

Unit 1: Linear interpolation methods – Newton's method
Unit 2: Solution of linear system by Gaussian elimination and Gauss-Jordon Methods
Unit 3: Iterative methods: Gauss Jacobi and Gauss-Seidel methods
Unit 4: Inverse of a matrix by Gauss Jordon method – Eigen value of a matrix

BLOCK 2 Interpolations and Approximation

Unit 1: Lagrangian Polynomials
Unit 2: Divided differences
Unit 3: Interpolating with a cubic spline
Unit 4: Newton's forward and backward difference formulas

BLOCK 3 Numerical Differentiations and Integration

Unit 1: Divided differences and finite differences
Unit 2: Numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rules
Unit 3: Two and Three point Gaussian Quadrature formulas
Unit 4: Double integrals using trapezoidal and Simpsons's rules

BLOCK 4 Initial Value Problems for Ordinary Differential Equations

Unit 1: Taylor series method
Unit 2: Euler and modified Euler methods
Unit 3: Fourth order Runge Kutta method for solving first and second order Equations
Unit 4: Multi step methods

BLOCK 5 Boundary Value Problems

Unit 1: Finite difference solution of second order ordinary differential equation
Unit 2: Finite difference solution of one dimensional heat equation
Unit 3: One dimensional wave equation and two dimensional Laplace
Unit 4: Poisson equations

Books:

1. C.F. Gerald and P.O. Wheatley, 'Applied Numerical Analysis', Sixth Edition, Pearson Education Asia, New Delhi, 2002.
2. E. Balagurusamy, 'Numerical Methods', Tata McGraw Hill Pub.Co.Ltd, New Delhi, 1999.
3. P. Kandasamy, K. Thilagavathy and K. Gunavathy, 'Numerical Methods', S.Chand Co. Ltd., New Delhi, 2003.
4. R.L. Burden and T.D. Faires, 'Numerical Analysis', Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002.

SEMESTER : IV

Subject Code : CE 4002

Subject Title : Strength of Materials

Structure of the Course Content

BLOCK 1 Principle of Energy

Unit 1: Strain energy and strain energy density
Unit 2: Castigliano's theorems – principle of virtual work
Unit 3: Application of energy theorems
Unit 4: Maxwell's reciprocal theorems

BLOCK 2 Indeterminate Beams

Unit 1: Propped cantilever and fixed beams
Unit 2: Theorem of three moments – analysis of continuous beams
Unit 3: Shear force and bending moment diagrams for continuous beams
Unit 4: Slope & deflections in continuous beams (qualitative study only)

BLOCK 3 Columns

Unit 1: Eccentrically loaded short columns – middle third rule – core section
Unit 2: Columns of unsymmetrical sections– Euler's theory of long columns
Unit 3: Critical loads for prismatic columns with different end conditions
Unit 4: Gordon formula for eccentrically loaded columns – cylinders

BLOCK 4 State of Stress in Three Dimensions

Unit 1: Spherical and deviatory components of stress tensor
Unit 2: Determination of principal stresses and principal planes – volumetric Strain
Unit 3: Dilatation and distortion – theories of failure
Unit 4: Principal stress dilatation – principal strain – shear stress – strain energy

BLOCK 5 Advanced Topics in Bending Of Beams

Unit 1: Unsymmetrical bending of beams of symmetrical and unsymmetrical Sections
Unit 2: Curved beams
Unit 3: Winkler Bach formula – stress concentration
Unit 4: Fatigue and Fracture

Books:

1. Egor P Popov, "Engineering Mechanics of Solids", Prentice Hall of India, New Delhi, 2003
2. V.N. Vazirani, M.M.Ratwani, "Analysis of Structures", Vol-1, Khanna Publishers, New Delhi
3. Kazimi S.M.A, "Solid Mechanics", Tata McGraw-Hill Publishing Co., New Delhi, 2003

4. William Nash, “Theory and Problems of Strength of Materials”, Schaum’s Outline Series, McGraw Hill International Edition
5. R.S. Khurmi, “Strength of Materials”, S. Chand & Company Ltd, New Delhi, 2003
6. Applied Mechanics by SB Junnarkar, Dr. HJ Shara, Charator publishing house.
7. Strength of Materials by S. Ramamrutham Dhanpat Rai Pub. Co, New Delhi.
8. Strength of Materials by L.Negi, Tata McGraw Hill, New Delhi
9. Schaum's Outline Of Statics and Mechanics of Materials by William Nash, Tata McGraw Hill, New Delhi
10. Mechanics of Materials by Ferdinand Beer.E, Russell Johnson, Jr John DeWolf.David Mazurek, Tata McGraw Hill, New Delhi

SEMESTER : IV

Subject Code : CE 4003

Subject Title : Industrial Hydraulic Engineering

Structure of the Course Content

BLOCK 1 OPEN CHANNEL FLOW

Unit 1: Types and regimes of flow
Unit 2: Velocity distribution in open channel
Unit 3: Wide open channel
Unit 4: Specific energy – Critical flow

BLOCK 2 UNIFORM FLOWS

Unit 1: Uniform flow – Velocity measurement
Unit 2: Manning's and Chezy's formula
Unit 3: Determination of roughness coefficients, normal depth and velocity
Unit 4: Most economical sections and Non-erodible channels

BLOCK 3 VARIED FLOWS

Unit 1: Dynamic equations of gradually varied flow
Unit 2: Assumptions and Characteristics of flow profiles
Unit 3: Draw down and back water curves – Profile determination
Unit 4: Hydraulic jump

BLOCK 4 TURBINES

Unit 1: Application of momentum principle – Impact of jets on plane and Curved plates
Unit 2: Turbines - classification
Unit 3: Radial flow turbines - axial flow turbines
Unit 4: Impulse and Reaction Turbine

BLOCK 5 PUMPS

Unit 1: Centrifugal pump
Unit 2: Multistage Pumps
Unit 3: Jet and submersible pumps
Unit 4: Positive displacement pumps - reciprocating pump

Books:

1. Subramanya K., "Flow in Open channels", Tata McGraw-Hill Publishing Company, 1994.
2. Kumar K.L., "Engineering Fluid Mechanics", Eurasia Publishing House (P) Ltd., New Delhi, (7th Edition), 1995.
3. Jain A.K., "Fluid Mechanics (including Hydraulic Machines)", Khanna Publishers, 8th edition, 1995.
4. Ranga Raju, K.G., "Flow through Open Channels", Tata McGraw-Hill, 1985

SEMESTER : IV
Subject Code : CE 4004
Subject Title : Highway Engineering
Structure of the Course Content

BLOCK 1 HIGHWAY PLANNING AND ALIGNMENT

Unit 1: Method of Road Construction, Highway Development in India
Unit 2: Requirements of Ideal Alignment, Factors Controlling Highway ++ Alignment Engineering Surveys for Alignment
Unit 3: Classification and Cross Section of Urban and Rural Roads
Unit 4: Highway Cross Sectional Elements

BLOCK 2 GEOMETRIC DESIGNS OF HIGHWAYS

Unit 1: Design of Horizontal Alignments
Unit 2: Design of Vertical Alignments
Unit 3: Sight Distances
Unit 4: Geometric Design of Hill Roads (IRC Standards Only)

BLOCK 3 DESIGNS OF RIGID AND FLEXIBLE PAVEMENTS

Unit 1: Rigid and Flexible Pavements- Components and their Functions
Unit 2: Design Principles of Flexible and Rigid Pavements
Unit 3: Design Practice for Flexible Pavements (IRC Recommendations- Problems)
Unit 4: Design Practice for Rigid Pavements (IRC Recommendations- Problems)

BLOCK 4 Highway Materials and Construction Practice

Unit 1: Properties and Testing of Highway Materials
Unit 2: Soil and Aggregate
Unit 3: Bitumen
Unit 4: Construction Practice

BLOCK 5 HIGHWAY MAINTENANCE

Unit 1: Types of defects in Flexible pavements
Unit 2: Types of Pavement, Failures in Rigid Pavements
Unit 3: Pavement Evaluation
Unit 4: Overlay design by Benkelman Beam Method and Principles of Highway Financing

Books:

1. Khanna K and Justo C E G, Highway Engineering, Khanna Publishers, Roorkee, 2001.
2. Kadiyali L R, Principles and Practice of Highway Engineering, Khanna Technical Publications, Delhi, 2000.
3. IRC Standards (IRC 37 - 2001 & IRC 58 -1998)
4. Bureau of Indian Standards (BIS) Publications on Highway Materials
5. Specifications for Road and Bridges, MORTH (India)

SEMESTER : IV

Subject Code : CE 4005

Subject Title : Mechanics of Fluids

Structure of the Course Content

BLOCK 1 DEFINITION AND FLUID PROPERTIES

Unit 1: Basic Definitions, Fluid and fluid mechanics
Unit 2: Dimensions and units
Unit 3: Fluid properties
Unit 4: Continuum Concept of system and control volume

BLOCK 2 FLUID STATICS & KINEMATICS

Unit 1: Pascal's Law and Hydrostatic equation – Forces on plane and curved Surfaces
Unit 2: Pressure measurement – Fluid mass under relative equilibrium
Unit 3: Stream, streak and path lines, Classification of flows and Continuity Equation
Unit 4: Stream and potential functions – flow nets – Velocity measurement

BLOCK 3 FLUID DYNAMICS

Unit 1: Euler and Bernoulli's equations and Applications
Unit 2: Laminar flows through pipes and between plates – Hagen Poiseuille Equation
Unit 3: Turbulent flow – Darcy-Weisbach formula
Unit 4: Moody diagram – Momentum Principle

BLOCK 4 BOUNDARY LAYER AND FLOW THROUGH PIPES

Unit 1: Definition of boundary layer – Thickness and classification
Unit 2: Displacement and momentum thickness
Unit 3: Development of laminar and turbulent flows in circular pipes and losses of flow in pipes
Unit 4: Pipes in series and in parallel – Pipe network

BLOCK 5 SIMILITUDES AND MODEL STUDY

Unit 1: Dimensional Analysis
Unit 2: Rayleigh's method, Buckingham's Pi-theorem
Unit 3: Similitude and models
Unit 4: Scale effect and distorted models

Books:

1. Kumar, K.L., "Engineering Fluid Mechanics", Eurasia Publishing House (P) Ltd., New Delhi, 1995.
2. Garde, R.J. and Mirajgaoker, A.G., "Engineering Fluid Mechanics", Nem Chand Bros., Roorkee

3. Rajput, R.K., “A text book of Fluid Mechanics in SI Units”
4. Fox, Robert, W. and Macdonald, Alan,T., “Introduction to Fluid Mechanics”, John Wiley & Sons, 1995
5. Streeter, Victor, L. and Wylie, Benjamin E., “Fluid Mechanics”, McGraw-Hill Ltd., 1998.
6. E. John Finnemore and Joseph B. Franzini, “Fluid Mechanics with Engineering Applications”, McGraw-Hill International Edition.
7. Pernard Messay, “Mechanics of Fluids” 7th Edition, Nelson Thornes Ltd. U. K. 1998.

SEMESTER : IV

Subject Code : CEP 003

Subject Title : Strength of Materials Lab

Structure of the Course Content

Practical

LIST OF EXPERIMENTS

1. Test involving axial compression to obtain the stress – strain curve
2. Test involving axial tension to obtain the stress – strain curve and the strength
3. Test involving torsion to obtain the torque vs. angle of twist and hence the stiffness
4. Test involving flexure to obtain the load deflection curve and hence the stiffness
5. Tests on springs
6. Hardness tests
7. Shear test
8. Test for impact resistance

SEMESTER : IV

Subject Code : CEP 004

Subject Title : Hydraulic Engineering Laboratory

Structure of the Course Content

Practical

LIST OF EXPERIMENTS

1. Determination of co-efficient of discharge for orifice
2. Determination of co-efficient of discharge for notches
3. Determination of co-efficient of discharge for venturimeter
4. Determination of co-efficient of discharge for orifice meter
5. Study of impact of jet on flat plate (normal / inclined)
6. Study of friction losses in pipes
7. Study of minor losses in pipes
8. Study on performance characteristics of Pelton turbine.
9. Study on performance characteristics of Francis turbine
10. Study on performance characteristics of Kaplan turbine
11. Study on performance characteristics of Centrifugal pumps (Constant speed / variable speed)
12. Study on performance characteristics of reciprocating pump.

SEMESTER : V

Subject Code : CE 5001

Subject Title : Surveying – II

Structure of the Course Content

BLOCK 1 TACHEOMETRIC SURVEYING

Unit 1: Tacheometric systems
Unit 2: Stadia systems
Unit 3: Fixed and movable hairs and Stadia constants
Unit 4: Anallactic lens - Subtense bar

BLOCK 2 CONTROL SURVEYING

Unit 1: Horizontal and vertical control methods
Unit 2: Instruments and accessores - Corrections
Unit 3: Satellite station - Reduction to centre
Unit 4: Single and reciprocal observations - Modern trends

BLOCK 3 SURVEY ADJUSTMENTS

Unit 1: Errors
Unit 2: True and most probable values - weighted observations - Method of Equal shifts
Unit 3: Principle of least squares - Normal equation - Correlates
Unit 4: Level nets - Adjustment of simple triangulation networks

BLOCK 4 ASTRONOMICAL SURVEYING

Unit 1: Astronomical terms and definitions - Motion of sun and stars
Unit 2: Apparent altitude and corrections - Celestial co-ordinate systems
Unit 3: Different time systems - Nautical almanac - Star constellations
Unit 4: Practical astronomy - Field observations and calculations for azimuth

BLOCK 5 OTHER TOPICS

Unit 1: Terrestial and aerial Photographs - Stereoscopy
Unit 2: Carrier waves
Unit 3: Hydrographic Surveying - Tides - MSL
Unit 4: Cadastral surveying

Books:

1. Bannister A. and Raymond S., Surveying, ELBS, Sixth Edition, 1992.
2. Punmia B.C., Surveying, Vols. I, II and III, Laxmi Publications, 1989.
3. Clark D., Plane and Geodetic Surveying, Vols. I and II, C.B.S. Publishers and Distributors, Delhi, Sixth Edition, 1971.
4. James M.Anderson and Edward M.Mikhail, Introduction to Surveying, McGraw-Hill Book Company, 1985.
5. Wolf P.R., Elements of Photogrammetry, McGraw-Hill Book Company, Second

Edition, 1986.

6. Robinson A.H., Sale R.D. Morrison J.L. and Muehrche P.C., Elements of Cartography, John Wiley and Sons, New York, Fifth Edition, 1984.
7. Heribert Kahmen and Wolfgang Faig, Surveying, Walter de Gruyter, 1995.
8. Kanetkar T.P., Surveying and Levelling, Vols. I and II, United Book Corporation, Pune, 1994.

SEMESTER : V
Subject Code : CE 5002
Subject Title : Environmental Engineering

Structure of the Course Content

BLOCK 1 WATER SUPPLY SYSTEMS

Unit 1: Water demand characteristics, Sources of water and Source selection
Unit 2: Water quality parameters & significance – Standards
Unit 3: Intake structures – Conveyance – Hydraulics
Unit 4: Laying, jointing & testing of pipes – Pump selection

BLOCK 2 WATER TREATMENT DESIGN PRINCIPLES

Unit 1: Selection of unit operations and processes
Unit 2: Design principles of flash mixer, flocculator, clarifiers, filters
Unit 3: Disinfection devices – Softening – Demineralisation – Aeration
Unit 4: Operation and Maintenance aspects - Residue Management

BLOCK 3 SEWERAGE SYSTEMS

Unit 1: Sources of wastewater – Quantity of sanitary sewage
Unit 2: Wastewater characteristics and significance
Unit 3: Design of sewers– Laying, jointing and testing of sewers
Unit 4: Sewer appurtenances – Pump selection

BLOCK 4 SEWAGE TREATMENT & DESIGN PRINCIPLES

Unit 1: Design principles of primary and secondary treatment
Unit 2: Aeration tank & oxidation ditch Trickling filter - Stabilisation ponds
Unit 3: Sludge: treatment and disposal
Unit 4: Biogas recovery – Sewage farming

BLOCK 5 DISPOSAL OF SEWAGE

Unit 1: Disposal on land and Disposal into water bodies
Unit 2: Oxygen sag curve
Unit 3: Streeter Phelp's model
Unit 4: Wastewater reclamation techniques

Books:

1. Garg, S.K.,"Environmental Engineering I & II", Khanna Publishers, New Delhi
2. Modi, P.N, "Environmental Engineering I & II" Standard Book House, Delhi 6
3. Manual on Water Supply and Treatment, CPHEEO, Government of India, New Delhi, 1999
4. Manual on Sewerage and Sewage Treatment, CPHEEO, Government of India, New Delhi, 1993
5. Hand book on Water Supply and Drainage, SP35, B.I.S., New Delhi, 1987
6. Metcalf and Eddy, M.C., "Wastewater Engineering – Treatment & Reuse", Tata McGraw-Hill Publications, New Delhi, 2003

SEMESTER : V

Subject Code : CE 5003

Subject Title : Foundation Engineering

Structure of the Course Content

BLOCK 1 SELECTION OF FOUNDATION

Unit 1: Methods of exploration-averaging and boring
Unit 2: Sampling Techniques
Unit 3: Bore log report – Penetration tests
Unit 4: Data interpretation– Selection of foundation based on soil condition

BLOCK 2 SHALLOW FOUNDATIONS

Unit 1: Location and depth of foundation
Unit 2: Terzaghi's formula and BIS formula – factors affecting bearing capacity
Unit 3: Bearing Capacity from insitu tests
Unit 4: Allowable bearing pressure, Settlement – Components of settlement

BLOCK 3 FOOTINGS AND RAFTS

Unit 1: Contact pressure distribution below footings & raft
Unit 2: Isolated and combined footings
Unit 3: Mat foundation
Unit 4: Floating foundation

BLOCK 4 PILES

Unit 1: Types of piles and their function and selection of pile
Unit 2: Carrying capacity of single pile in granular and cohesive soil
Unit 3: Capacity from insitu tests (SPT and SCPT) – Negative skin friction – Uplift capacity
Unit 4: Settlement of pile groups – Interpretation of pile load test – Forces on Pile caps

BLOCK 5 RETAINING WALLS

Unit 1: Plastic equilibrium in soils – active and passive states
Unit 2: Rankine's theory – cohesionless and cohesive soil
Unit 3: Coloumb's wedge theory – condition for critical failure plane
Unit 4: Earth pressure on retaining walls of simple configurations and Graphical methods

Books:

1. Murthy, V.N.S, "Soil Mechanics and Foundation Engineering", UBS Publishers Distribution Ltd, New Delhi, 1999.
2. Gopal Ranjan and Rao, A.S.R. "Basic and Applied Soil Mechanics", Wiley Eastern

Ltd., New Delhi (India), 2003.

3. Das, B.M. “Principles of Foundation Engineering (Fifth edition), Thomson Books / COLE, 2003
4. Swamisaran, “Analysis and Design of Structures – Limit state Design”, Oxford IBH Publishing Co-Pvt. Ltd., New Delhi, 1998
5. Kaniraj, S.R, “Design aids in Soil Mechanics and Foundation Engineering”, Tata McGraw Hill publishing company Ltd., New Delhi, 2002
6. Bowles J.E, “Foundation analysis and design”, McGraw-Hill, 1994
7. Punmia, B.C., “Soil Mechanics and Foundations”, Laxmi publications pvt. Ltd., New Delhi, 1995.
8. Venkatramaiah, C. ”Geotechnical Engineering”, New Age International Publishers, New Delhi, 1995
9. N.N. Som and S.C. Das, “Theory and Practice of Foundation Design”, Prentice Hall of India Pvt. Ltd., New Delhi, 2003

SEMESTER : V

Subject Code : CE 5004

Subject Title : Railways, Docks & Harbours and Airports

Structure of the Course Content

BLOCK 1 RAILWAY PLANNING AND DESIGN

Unit 1: Role of Indian Railways in National Development
Unit 2: Rails
Unit 3: Sleepers and Ballasts
Unit 4: Geometric Design of Railway Tracks

BLOCK 2 RAILWAY TRACK

Unit 1: Points and Crossings, Signalling
Unit 2: Construction & Maintenance Railway track
Unit 3: Lay outs of Railway Stations and Yards
Unit 4: Automated maintenance and upgrading Technologies, Relaying of Track

BLOCK 3 AIRPORT PLANNING AND DESIGN

Unit 1: Airport Planning
Unit 2: Runway Design
Unit 3: Taxiway Design
Unit 4: Airport Zoning

BLOCK 4 AIRPORT LAYOUTS, VISUAL AIDS, AND AIR TRAFFIC CONTROL

Unit 1: Airport Layouts
Unit 2: Airport Buildings
Unit 3: Visual Aids
Unit 4: Air Traffic Control

BLOCK 5 HARBOUR ENGINEERING

Unit 1: Definition of Terms - Harbours
Unit 2: Requirements and Classification of Harbours, Site Selection & Selection Investigation
Unit 3: Shore Considerations
Unit 4: other modes of transport

Books:

1. Saxena Subhash C and Satyapal Arora, A Course in Railway Engineering, Dhanpat Rai and Sons, Delhi, 1998.
2. Khanna S K, Arora M G and Jain S S, Airport Planning and Design, Nemchand and Brothers, Roorkee, 1994.

3. S P Bindra, A Course in Docks and Harbour Engineering, Dhanpat Rai and Sons, New Delhi, 1993.
4. Rangwala, Railway Engineering, Charotar Publishing House, 1995.
5. Rangwala, Airport Engineering, Charotar Publishing House, 1996.
6. Oza and Oza, “A course in Docks & Harbour Engineering”.
7. J.S. Mundrey, “A course in Railway Track Engineering”.

SEMESTER : V
Subject Code : CE 5005
Subject Title : Water Resources Engineering
Structure of the Course Content

BLOCK 1 GENERAL

Unit 1: Water resources survey
Unit 2: Description of water resources planning
Unit 3: Economics of water resources planning, physical and socio economic Data
Unit 4: National Water Policy

BLOCK 2 NETWORK DESIGN

Unit 1: Hydrologic measurements
Unit 2: Analysis of hydrologic data
Unit 3: Hydrologic station network
Unit 4: Station network design

BLOCK 3 WATER RESOURCE NEEDS

Unit 1: Consumptive and non-consumptive water use
Unit 2: Estimation of water requirements for irrigation
Unit 3: Water characteristics and quality
Unit 4: Water budget and development plan

BLOCK 4 RESERVOIR PLANNING AND MANAGEMENT

Unit 1: Reservoir
Unit 2: Sedimentation of reservoirs
Unit 3: Design flood-levees and flood walls
Unit 4: Channel improvement

BLOCK 5 ECONOMIC ANALYSES

Unit 1: Estimation of cost and Evaluation of Benefits
Unit 2: Discount rate - Discounting factors
Unit 3: Discounting techniques
Unit 4: Computer Applications

Books:

1. Linsley R.K. and Franzini J.B, "Water Resources Engineering", McGraw-Hill Inc, 2000.
2. Douglas J.L. and Lee R.R., "Economics of Water Resources Planning", Tata McGraw-Hill Inc. 2000.
3. Duggal, K.N. and Soni, J.P., "Elements of Water Resources Engineering", New Age International Publishers
4. Chaturvedi M.C., "Water Resources Systems Planning and Management", Tata McGraw-Hill Inc., New Delhi, 1997.
5. Goodman Alvin S., "Principles of Water Resources Planning", Prentice-Hall, 1984.
6. Maass et al. Design of Water Resources Systems, Macmillan, 1968.

SEMESTER : V

Subject Code : CEP 005

Subject Title : Environmental Engineering Laboratory

Structure of the Course Content

Practical
LIST OF EXPERIMENTS

1. Sampling and preservation methods and significance of characterisation of water and wastewater.
2. Determination of
3. PH and turbidity
4. Hardness
5. Determination of iron & fluoride
6. Determination of residual chlorine
7. Determination of Ammonia Nitrogen
8. Determination of Sulphate
9. Determination of available Chlorine in Bleaching powder
10. Determination of dissolved oxygen
11. Determination of suspended, volatile and fixed solids
12. B.O.D. test and C.O.D. test
13. Introduction to Bacteriological Analysis (Demonstration only)

REFERENCES

1. Standard methods for the examination of water and wastewater, APHA, 20th Edition, Washington, 1998
2. Garg, S.K., "Environmental Engineering Vol. I & II", Khanna Publishers, New Delhi
3. Modi, P.N., "Environmental Engineering Vol. I & II", Standard Book House, Delhi-6

SEMESTER : V

Subject Code : CEP 006

Subject Title : Survey Practical – II

Structure of the Course Content

Practical

1. Study of theodolite
2. Measurement of horizontal angles by reiteration and repetition and vertical angles
3. Theodolite survey traverse
4. Heights and distances - Triangulation - Single plane method.
5. Tacheometry - Tangential system - Stadia system - Subtense system.
6. Setting out works - Foundation marking - Simple curve (right/left-handed) - Transition curve.
7. Field observation for and Calculation of azimuth
8. Demonstration of EDM.

SEMESTER : VI

Subject Code : CE 6001
Subject Title : Irrigation Engineering
Structure of the Course Content

BLOCK 1 Introduction of Irrigation

Unit 1: Need and mode of irrigation – Merits and demerits of irrigation
Unit 2: Crop and crop seasons – consumptive use of water
Unit 3: Duty – Factors affecting duty and Irrigation efficiencies
Unit 4: Planning and Development of irrigation projects

BLOCK 2 IRRIGATION METHODS

Unit 1: Canal irrigation
Unit 2: Lift irrigation
Unit 3: Tank irrigation and Flooding methods
Unit 4: Sprinkler irrigation and Drip irrigation

BLOCK 3 DIVERSION AND IMPOUNDING STRUCTURES

Unit 1: Weirs
Unit 2: Types of impounding structures
Unit 3: Gravity dams – Earth dams – Arch dams
Unit 4: Factors affecting location and type of dams and Hydraulic design of Dams

BLOCK 4 CANAL IRRIGATION

Unit 1: Classification of canals – Canal drops
Unit 2: Hydraulic design of drops
Unit 3: Hydraulic design of cross drainage works
Unit 4: Canal Head works – Canal regulators – River Training works

BLOCK 5 IRRIGATION WATER MANAGEMENT

Unit 1: Need for optimisation of water use – Minimising irrigation water losses
Unit 2: On farm development works – Percolation ponds
Unit 3: Participatory irrigation management, Water users associations
Unit 4: Changing paradigms in water management and Performance evaluation

Books:

1. Asawa, G.L., "Irrigation Engineering", New Age International Publishers
2. Sharma R.K., and Sharma T.K., "Irrigation Engineering", S. Chand and company, New Delhi
3. Gupta, B.L, & Amir Gupta, "Irrigation Engineering", Satya Praheshan, New Delhi
4. Dilip Kumar Majumdar, "Irrigation Water Management (Principles & Practices)", Prentice Hall of India (P), Ltd.
5. Basak, N.N, "Irrigation Engineering", Tata McGraw-Hill Publishing Co.
6. Garg, S.K., "Irrigation Engineering"

SEMESTER : VI
Subject Code : CE 6002
Subject Title : Structural Analysis
Structure of the Course Content

BLOCK 1 DEFLECTION OF DETERMINATE STRUCTURES

Unit 1: Principles of virtual work for deflections
Unit 2: Deflections of pin-jointed plane frames and rigid plane frames
Unit 3: Willot diagram
Unit 4: Mohr's correction

BLOCK 2 MOVING LOADS AND INFLUENCE LINES

Unit 1: Influence lines for reactions in statically determinate structures and Members
Unit 2: Calculation of critical stress resultants due to concentrated and Distributed moving loads
Unit 3: Muller Breslau's principle
Unit 4: Indirect model analysis for influence lines of indeterminate structures

BLOCK 3 ARCHES

Unit 1: Arches as structural forms
Unit 2: Types of arches
Unit 3: Analysis of three hinged, two hinged and fixed arches, parabolic and Circular arches
Unit 4: Settlement and temperature effects.

BLOCK 4 SLOPE DEFLECTION METHOD

Unit 1: Continuous beams and rigid frames
Unit 2: Symmetry and antisymmetry
Unit 3: Simplification for hinged end
Unit 4: Support displacements

BLOCK 5 MOMENT DISTRIBUTION METHOD

Unit 1: Distribution and carry over of moments
Unit 2: Stiffness and carry over factors – Analysis of continuous beams
Unit 3: Plane rigid frames with and without sway
Unit 4: Naylor's simplification

Books:

1. "Comprehensive Structural Analysis – Vol. 1 & Vol. 2", Vaidyanadhan, R and Perumal, P, Laxmi Publications, New Delhi, 2003
2. "Structural Analysis", L.S. Negi & R.S. Jangid, Tata McGraw-Hill Publications, New Delhi, Sixth Edition, 2003
3. "Intermediate Structures", Wang, C.K., McGraw-Hill
4. Analysis of Indeterminate Structures – C.K. Wang, Tata McGraw-Hill

SEMESTER : VI

Subject Code : CE 6003

Subject Title : Construction Planning & Scheduling

Structure of the Course Content

BLOCK 1 CONSTRUCTION PLANNING

Unit 1: Basic concepts in the development of construction plans
Unit 2: Choice of Technology and Construction method-Defining Work Tasks
Unit 3: Precedence relationships among activities
Unit 4: Estimating Activity Durations-Estimating Resource Requirements for Works

BLOCK 2 SCHEDULING PROCEDURES AND TECHNIQUES

Unit 1: Relevance of construction schedules-Bar charts
Unit 2: The critical path method and Critical Scheduling
Unit 3: Resource oriented scheduling
Unit 4: Improving the Scheduling process and Introduction to application Software

BLOCK 3 COST CONTROLS MONITORING AND ACCOUNTING

Unit 1: The project Budget-Forecasting for Activity cost control
Unit 2: Financial accounting systems and cost accounts
Unit 3: Control of project cash flows-Schedule control
Unit 4: Schedule and Budget updates-Relating cost and schedule information

BLOCK 4 QUALITY CONTROL AND SAFETY DURING CONSTRUCTION

Unit 1: Quality and safety Concerns in Construction
Unit 2: Total Quality control
Unit 3: Statistical Quality control with Sampling by Attributes
Unit 4: Statistical Quality control by Sampling and Variables-Safety

BLOCK 5 ORGANIZATIONS AND USE OF PROJECT INFORMATION

Unit 1: Types of project information-Accuracy and Use of Information
Unit 2: Computerized organization and use of Information
Unit 3: Other conceptual Models of Databases
Unit 4: Centralized database Management systems

Books:

1. Chitkara, K.K. “Construction Project Management Planning”, Scheduling and Control, Tata McGraw-Hill Publishing Co., New Delhi, 1998.
2. Chris Hendrickson and Tung Au, “Project Management for Construction – Fundamentals Concepts for Owners”, Engineers, Architects and Builders, Prentice

Hall, Pitsburgh, 2000.

3. Moder.J., C.Phillips and Davis, “Project Management with CPM”, PERT and Precedence Diagramming, Van Nostrand Reinhold Co., Third Edition, 1983.
4. Willis., E.M., “Scheduling Construction projects”, John Wiley and Sons 1986.
5. Halpin,D.W., “Financial and cost concepts for construction Management”, John Wiley and Sons, New York, 1985.

SEMESTER : VI
Subject Code : CE 6004
Subject Title : Principles of Management
Structure of the Course Content

BLOCK 1 OVERVIEW OF MANAGEMENT

Unit 1: Definition - Management - Role of managers
Unit 2: Evolution of Management thought
Unit 3: Organization and the environmental factors
Unit 4: Trends and Challenges of Management in Global Scenario

BLOCK 2 PLANNING

Unit 1: Planning process - Types of plans
Unit 2: Managing by objective (MBO) Strategies
Unit 3: Policies
Unit 4: Decision Making

BLOCK 3 ORGANIZING

Unit 1: Organization structure
Unit 2: Departmentation - Span of control - Centralization and Decentralization
Unit 3: Staffing - Selection and Recruitment - Orientation
Unit 4: Training - Performance Appraisal

BLOCK 4 DIRECTING

Unit 1: Creativity and Innovation - Motivation and Satisfaction
Unit 2: Leadership Styles - Leadership theories
Unit 3: Communication
Unit 4: Organization Culture

BLOCK 5 CONTROLLING

Unit 1: Process of controlling - Types of control
Unit 2: Budgetary and non-budgetary control techniques
Unit 3: Managing Productivity - Cost Control
Unit 4: Quality Control - Planning operations

Books:

1. Stephen P. Robbins and Mary Coulter, 'Management', Prentice Hall of India, 8th edition.
2. Charles W L Hill, Steven L McShane, 'Principles of Management', Mcgraw Hill Education, Special Indian Edition, 2007.
3. Hellriegel, Slocum & Jackson, ' Management - A Competency Based Approach', Thomson South Western, 10th edition, 2007.
4. Harold Koontz, Heinz Weihrich and Mark V Cannice, 'Management - A global& Entrepreneurial Perspective', Tata Mcgraw Hill, 12th edition, 2007.
5. Andrew J. Dubrin, 'Essentials of Management', Thomson Southwestern, 7th edition, 2007.

SEMESTER : VI
Subject Code : CE 6005
Subject Title : Industrial Waste Management
Structure of the Course Content

BLOCK 1 INTRODUCTION

Unit 1: Types of industries and industrial pollution
Unit 2: Bioassay studies
Unit 3: Effects of industrial effluents on streams, sewer, land, sewage treatment Plants
Unit 4: Environmental legislations related to prevention and control

BLOCK 2 CLEANER PRODUCTIONS

Unit 1: Waste management Approach
Unit 2: Waste Audit
Unit 3: Volume and strength reduction
Unit 4: Material and process modifications

BLOCK 3 POLLUTION FROM MAJOR INDUSTRIES

Unit 1: Sources, Characteristics, waste treatment of Textiles, Tanneries, Pharmaceuticals
Unit 2: Sources, Characteristics, waste treatment of Electroplating industries, Dairy, Sugar, Paper
Unit 3: Sources, Characteristics, waste treatment of distilleries, Steel plants, Refineries, fertilizer
Unit 4: Wastewater reclamation concepts

BLOCK 4 TREATMENT TECHNOLOGIES

Unit 1: Removal of suspended and dissolved organic solids
Unit 2: Chemical oxidation and Adsorption
Unit 3: Removal of dissolved inorganics
Unit 4: Combined treatment of industrial and municipal wastes

BLOCK 5 HAZARDOUS WASTE MANAGEMENT

Unit 1: Hazardous wastes
Unit 2: Physico chemical treatment
Unit 3: Solidification – incineration
Unit 4: Secured land fills

Books:

1. M.N.Rao & A.K.Dutta, "Wastewater Treatment", Oxford - IBH Publication, 1995.
2. W .W. Eckenfelder Jr., "Industrial Water Pollution Control", McGraw-Hill Book Company, New Delhi, 2000.
3. T.T.Shen, "Industrial Pollution Prevention", Springer, 1999.
4. R.L.Stephenson and J.B.Blackburn, Jr., "Industrial Wastewater Systems Hand book", Lewis Publisher, New Yark, 1998
5. H.M.Freeman, "Industrial Pollution Prevention Hand Book", McGraw-Hill Inc., New Delhi, 1995.
6. Bishop, P.L., "Pollution Prevention: Fundamental & Practice", McGraw-Hill, 2000.

SEMESTER : VI

Subject Code : CEP 007

Subject Title : Irrigation Engineering Drawing

Structure of the Course Content

Practical

1. TANK IRRIGATION STRUCTURES

Tank bunds – Tank surplus weirs – Tank sluices weirs on pervious foundations - Percolation ponds – Detailed drawings showing foundation details, plan and elevation.

2. IMPOUNDING STRUCTURES

Gravity Dams – Earth dams – Arch dams – Spill ways – Energy dissipation devices – Drawing showing plan, elevation, half sections including foundation details

3. CANAL TRANSMISSION STRUCTURES

Aqueducts – Syphon aqueducts – Super passage – Canal syphon – Canal drops – Notch type – Rapid type fall – Syphon well drops – Drawing showing plan, elevation, foundation details

4. CANAL REGULATION STRUCTURES

Canal head works – Canal regulator – Canal escape – Silt exclusion structures – Drawing showing detailed plan, elevation and foundation

5. IRRIGATION WATER MANAGEMENT STRUCTURES

On farm development works – Structures for proportional field distribution – Duck bill weirs – Detailed drawings showing foundations and superstructure details.

Reference Book

1. Garg, S.K, "Irrigation Engineering and Design of Structures"
2. Satyanarayana Murthy, "Irrigation Design and Drawing", Published by Mrs. L. Banumathi, Tuni, East Godavari District, A.P. 1998
3. Sharma R.K, "Irrigation Engineering and Hydraulic Structures", Oxford and IBH Publishing Co., New Delhi, 2002
4. Elhis, "Irrigation Engineering Structures"

SEMESTER : VI

Subject Code : CEP 008

Subject Title : Environmental Engineering Drawing

Structure of the Course Content

Practical

1. Design & drawing of aerators, chemical feeding facility, flash mixer, flocculator, clarifier – Slow sand filter – Rapid sand filter – Pressure filter – Chlorinator – Bleaching powder doser – Softeners – Demineralisation plant
2. Design and drawing of infiltration gallery – Iron removal plants – Fluoride removal plants – Service reservoirs
3. Design and drawing of screen chamber – Grit channel – Primary clarifier – Activated sludge process – Aeration tank & oxidation ditch – Trickling filters – Secondary clarifiers – Upflow anaerobic sludge blanket reactors – Upflow anaerobic filter – Sludge digester – Sludge drying beds – Waste stabilisation ponds
4. Drawing of raw water – Intake towers – Manholes – Sewer lines – Pumping stations for water and sewage
5. Design and drawing of: Water supply and drainage for buildings – Septic tanks and disposal arrangements – House service connection for water supply and drainage – Appurtenances in water supply and drainage

REFERENCES

1. Manual on Water Supply and Treatment, CPHEEO, Government of India, New Delhi, 1999
2. Manual of Sewerage and Sewage Treatment, CPHEEO, Government of India, New Delhi, 1993
3. Hand book on Water Supply and Drainage, SP35, B.I.S., New Delhi, 1987
4. Peary, H.S., Rowe, D.R., and Tchobanoglous, G., “Environmental Engineering”, McGraw-Hill Book Co., New Delhi, 1995
5. Metcalf & Eddy, “Wastewater Engineering (Treatment and Reuse)”, 4th Edition, Tata McGraw-Hill, New Delhi, 2003

SEMESTER : VII

Subject Code : CE 7001

Subject Title : Estimation and Quantity Surveying

Structure of the Course Content

BLOCK 1 ESTIMATE OF BUILDINGS

Unit 1: Load bearing and framed structures
Unit 2: Calculation of quantities of brick work, RCC, PCC, Plastering, white Washing
Unit 3: Calculation of brick work and RCC works in arches
Unit 4: Estimate of joineries for paneled and glazed doors, windows, Ventilators

BLOCK 2 ESTIMATES OF OTHER STRUCTURES

Unit 1: Estimating of septic tank, soak pit
Unit 2: Sanitary and water supply installations – water supply pipe line
Unit 3: Sewer line – tube well – open well
Unit 4: Estimate of bituminous and cement concrete roads

BLOCK 3 SPECIFICATION AND TENDERS

Unit 1: Data – Schedule of rates – Analysis of rates
Unit 2: Specifications and sources
Unit 3: Tenders and Contracts
Unit 4: Arbitration and legal requirements

BLOCK 4 VALUATIONS

Unit 1: Necessity and Basics of value engineering
Unit 2: Capitalised value – Depreciation
Unit 3: Escalation and Value of building
Unit 4: Calculation of Standard rent – Mortgage – Lease

BLOCK 5 REPORT PREPARATIONS

Unit 1: Principles for report preparation
Unit 2: Report on estimate of residential building – Culvert – Roads
Unit 3: Report on Estimate of Water supply and sanitary installations
Unit 4: Report on Estimate of Tube wells – Open wells

Books:

1. Dutta, B.N., "Estimating and Costing in Civil Engineering", UBS Publishers & Distributors Pvt. Ltd., 2003
2. Kohli, D.D and Kohli, R.C., "A Text Book of Estimating and Costing (Civil)", S.Chand &Company Ltd., 2004
3. PWD Data Book.

SEMESTER : VII

Subject Code : CE 7002

Subject Title : Building Services

Structure of the Course Content

BLOCK 1 MACHINERIES

Unit 1: Hot Water Boilers, Lifts and Escalators
Unit 2: Special features required for physically handicapped and elderly
Unit 3: Conveyors – Vibrators – Concrete mixers
Unit 4: DC/AC motors, Generators and Laboratory services

BLOCK 2 ELECTRICAL SYSTEMS IN BUILDINGS

Unit 1: Basics of electricity
Unit 2: Earthing for safety
Unit 3: Wiring Systems
Unit 4: Planning for Building Wiring

BLOCK 3 PRINCIPLES OF ILLUMINATION & DESIGN

Unit 1: Modern theory of light and colour
Unit 2: Synthesis of light
Unit 3: Classification of lighting
Unit 4: Design of modern lighting

BLOCK 4 REFRIGERATION PRINCIPLES & APPLICATIONS

Unit 1: Heat
Unit 2: Refrigerants
Unit 3: Compressors – Evaporators
Unit 4: Air conditioning systems

BLOCK 5 FIRE SAFETY INSTALLATIONS

Unit 1: Causes of fire in buildings, Safety regulations and NBC
Unit 2: Planning considerations in buildings
Unit 3: Heat and smoke detectors
Unit 4: Fire alarm system, snorkel ladder

Books:

1. E.R.Ambrose, "Heat Pumps and Electric Heating", John and Wiley and Sons, Inc., New York, 1968.
2. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968.
3. Philips Lighting in Architectural Design, McGraw-Hill, New York, 1964.
4. R.G.Hopkinson and J.D.Kay, "The Lighting of buildings", Faber and Faber, London, 1969.
5. William H.Severns and Julian R.Fellows, "Air-conditioning and Refrigeration", John

Wiley and Sons, London, 1988.

6. A.F.C. Sherratt, “Air-conditioning and Energy Conservation”, The Architectural Press, London, 1980.
7. National Building Code.

SEMESTER : VII

Subject Code : CE 7003

Subject Title : Design of Steel Structures

Structure of the Course Content

BLOCK 1 INTRODUCTION of Steel Structure

Unit 1: Properties of steel – Structural steel sections
Unit 2: Limit State Design Concepts – Loads on Structures
Unit 3: Metal joining methods using rivets, welding, bolting
Unit 4: Eccentric connections, Efficiency of joints and High Tension bolts

BLOCK 2 TENSION MEMBERS

Unit 1: Types of sections
Unit 2: Net area – Net effective sections for angles and Tee in tension
Unit 3: Design of connections in tension members
Unit 4: Design of tension splice

BLOCK 3 COMPRESSION MEMBERS

Unit 1: Types of compression members and Theory of columns
Unit 2: Design of single section and compound section compression members
Unit 3: Design of lacing and battening type columns
Unit 4: Design of column bases

BLOCK 4 BEAMS

Unit 1: Design of laterally supported and unsupported beams
Unit 2: Built up beams
Unit 3: Design of plate girders riveted and welded
Unit 4: Design of beam columns

BLOCK 5 ROOF TRUSSES AND INDUSTRIAL STRUCTURES

Unit 1: Roof trusses
Unit 2: Roof and side coverings
Unit 3: Design loads, design of purlin and elements of truss
Unit 4: Design of gantry girder

Books:

1. Dayaratnam, P., "Design of Steel Structures", Second edition, S. Chand & Company, 2003
2. Ramachandra, S., "Design of Steel Structures – Vol. I & II", Standard Publication, New Delhi
3. "Teaching Resources for Structural Steel Design – Vol. I & II", INSDAG, Kolkatta.
4. Gaylord, E.H., Gaylord, N.C., and Stallmeyer, J.E., "Design of Steel Structures", 3rd edition, McGraw-Hill Publications, 1992

SEMESTER : VII

Subject Code : CEP 009

Subject Title : Computer Aided Design and Drafting Laboratory

Structure of the Course Content

Practical

1. Design and drawing of RCC cantilever and counterfort type retaining walls with reinforcement details
2. Design of solid slab and RCC Tee beam bridges for IRC loading and reinforcement details
3. Design of pressed, rectangular and hemispherical bottomed steel tank – Staging – Detailed drawings
4. Design and drafting of Intz type water tank, Detailing of circular and rectangular water tanks
5. Design of plate girder bridge – Twin Girder deck type railway bridge – Truss Girder bridges – Detailed Drawings including connections

REFERENCES

1. Krishna Raju, "Structural Design & Drawing (Concrete & Steel)", CBS Publishers
2. Punmia, B.C., Ashok Kumar Jain, Arun Kumar Jain, "Design of steel structures", Lakshmi publications Pvt. Ltd.
3. Krishnamurthy, D., "Structural Design & Drawing – Vol. II", CBS Publishers & Distributors, Delhi
4. Krishnamurthy, D., "Structural Design & Drawing – Vol. III Steel Structures", CBS Publishers & Distributors, New Delhi

SEMESTER : VII

Subject Code : CEP 010

Subject Title : Design Project

Structure of the Course Content

Practical

This course conceives purely a design problem in any one of the disciplines of Civil Engineering; e.g., Design of an RC structure, Design of a waste water treatment plant, Design of a foundation system, Design of traffic intersection etc. The design problem can be allotted to either an individual student or a group of students comprising of not more than four. At the end of the course the group should submit a complete report on the design problem consisting of the data given, the design calculations, specifications if any and complete set of drawings which follow the design.

EVALUATION PROCEDURE

The method of evaluation will be as follows:

1. Internal Marks : (Decided by conducting 3 reviews by the guide appointed by the Institution or Study Centre)
2. Evaluation of Project Report: (Evaluated by the external examiner appointed the University). Every student belonging to the same group gets the same mark
3. Viva voce examination : (Evaluated by the internal examiner appointed by the HOD with the approval of HOI, external examiner appointed by the University and Guide of the course – with equal Weight age)

SEMESTER : VIII

Subject Code : CE 8001
Subject Title : Engineering Economics and Cost Analysis
Structure of the Course Content

BLOCK 1 BASIC ECONOMICS

Unit 1: Basic Terms and scope of economic science
Unit 2: Factors of production
Unit 3: Law of diminishing marginal utility
Unit 4: Relation between economic decision and technical decision

BLOCK 2 DEMANDS AND SCHEDULE

Unit 1: Demand
Unit 2: Types of elasticity
Unit 3: Supply
Unit 4: Perfect competition, monopoly and monopolistic competition.

BLOCK 3 ORGANISATIONS

Unit 1: Forms of business, proprietorship and partnership
Unit 2: Cooperative organisations, state enterprise - mixed economy
Unit 3: Money and Banking
Unit 4: Control of credit - monetary policy - credit instrument

BLOCK 4 FINANCING

Unit 1: Types of financing
Unit 2: External commercial borrowings
Unit 3: Analysis of financial statement
Unit 4: Balance Sheet, Profit and Loss account

BLOCK 5 COST AND BREAK EVEN ANALYSES

Unit 1: Types of costing
Unit 2: Pricing practice
Unit 3: Cost benefit analysis
Unit 4: Break even analysis

Books:

1. Dewett K.K. & Varma J.D., Elementary Economic Theory, S Chand & Co., 2006
2. Sharma JC "Construction Management and Accounts" Satya Prakashan, New Delhi.
3. Barthwal R.R., Industrial Economics - An Introductory Text Book, New Age
4. Jhingan M.L., Micro Economic Theory, Konark
5. Samuelson P.A., Economics - An Introductory Analysis, McGraw-Hill
6. Adhikary M., Managerial Economics
7. Khan MY and Jain PK "Financial Management" McGraw-Hill Publishing Co., Ltd
8. Varshney RL and Maheshwary KL " Managerial Economics" S Chand and Co

SEMESTER : VIII

Subject Code : CEP 011

Subject Title : Survey Camp

Structure of the Course Content

Practical

Ten days survey camp using Theodolite, cross staff, levelling staff, tapes, plane table and total station. The camp must involve work on a large area of not less than 400 hectares. At the end of the camp, each student shall have mapped and contoured the area. The camp record shall include all original field observations, calculations and plots.

(i) Triangulation

(ii) Trilateration

(iii) Sun / Star observation to determine azimuth

(iv) Use of GTS to determine latitude and longitude

SEMESTER : VIII

Subject Code : CEP 012

Subject Title : Project Work

Structure of the Course Content

Practical

The objective of the project work is to enable the students to work in convenient groups of not more than four members in a group on a project involving theoretical and experimental studies related to Civil Engineering. Every Project Work shall have a Guide who is a member of the faculty of Civil Engineering of the college where the student is registered. The hours allotted for this course shall be utilized by the students to receive directions from the Guide, on library reading, laboratory work, computer analysis or field work and also to present in periodical seminars the progress made in the project.

Each student shall finally produce a comprehensive report covering background information, literature Survey, problem statement, Project work details and conclusions. This experience of project work shall help the student in expanding his / her knowledge base and also provide opportunity to utilise the creative ability and inference capability.

Subject Code : CEE 001

Subject Title : Electronic Surveying

Structure of the Course Content

BLOCK 1 Basic of Electronics Surveying

Unit 1: Fundamentals of electronics
Unit 2: Display Devices
Unit 3: Modulation & Demodulation
Unit 4: Power Sources

BLOCK 2 PROPAGATION OF ELECTROMAGNETIC WAVES

Unit 1: Definition, classification, applications, propagation properties
Unit 2: Wave propagation
Unit 3: Refractive index
Unit 4: real time application of velocity correction

BLOCK 3 ELECTROMAGNETIC

Unit 1: Electro-optical system
Unit 2: Infrared EDM instruments, Laser EDM
Unit 3: EDM instruments
Unit 4: Application

BLOCK 4 Microwave systems

Unit 1: Measuring principle
Unit 2: Working principle
Unit 3: Microwave EDM instruments
Unit 4: Comparison with Electro-optical system

BLOCK 5 ELECTROMAGNETIC DISTANCE MEASURING SYSTEM

Unit 1: Modern Positioning Systems
Unit 2: EDM traversing
Unit 3: Trilateration measurement using EDM
Unit 4: Base line measurement using EDM

Books:

1. Burnside, C.D. Electromagnetic distance measurement Crosby Lock wood staples, U.K. 1971.
2. Rueger, J.M. Electronic Distance Measurement, Springer-Verlag, Berlin, 1990.
3. Laurila, S.H. Electronic Surveying in Practice, John Wiley and Sons Inc, 1983.
4. Soastamoinen, J.J. Surveyor's guide to electro-magnetic Distance Measurement, Adam Hilger Ltd., 1967.

Subject Code : CEE 002
Subject Title : Total Quality Management
Structure of the Course Content

BLOCK 1 INTRODUCTION

Unit 1: Basic concepts of Total Quality Management
Unit 2: Principles of TQM, Leadership
Unit 3: Planning, Deming Philosophy
Unit 4: Barriers to TQM Implementation

BLOCK 2 TQM PRINCIPLES

Unit 1: Customer satisfaction
Unit 2: Continuous Process Improvement
Unit 3: Partnering, sourcing, Supplier
Unit 4: Basic Concepts, Strategy, Performance Measure

BLOCK 3 STATISTICAL PROCESS CONTROL (SPC)

Unit 1: seven tools of quality
Unit 2: Measures of central Tendency and Dispersion
Unit 3: Control Charts for variables and attributes
Unit 4: Concept of six sigma

BLOCK 4 TQM TOOLS

Unit 1: Benchmarking
Unit 2: Quality Function Deployment
Unit 3: Total Productive Maintenance (TPM)
Unit 4: FMEA

BLOCK 5 QUALITY SYSTEMS

Unit 1: ISO 9000:2000 Quality System
Unit 2: Concepts of TS 16949
Unit 3: Concepts of ISO 14000
Unit 4: Implementation of Quality System

Books:

1. Dale H.Besterfiled, et al., Total Quality Management, Pearson Education, Inc. 2003. (Indian reprint 2004). ISBN 81-297-0260-6.
2. James R.Evans & William M.Lidsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
3. Feigenbaum.A.V. “Total Quality Management, McGraw Hill, 1991.
4. Oakland.J.S. “Total Quality Management Butterworth – Hcinemann Ltd., Oxford. 1989.
5. Narayana V. and Sreenivasan, N.S. Quality Management – Concepts and Tasks, New Age International 1996.
6. Zeiri. “Total Quality Management for Engineers Wood Head Publishers, 1991.

Subject Code : CEE 003

Subject Title : Intellectual Property Rights (IPR)

Structure of the Course Content

BLOCK 1 Introduction of IP

Unit 1: Invention and Creativity of IP
Unit 2: Protection of IPR
Unit 3: Importance of IP
Unit 4: Basic types of property

BLOCK 2 Copy Write and Trade Mark

Unit 1: Trade Marks
Unit 2: Copyrights and related rights
Unit 3: Protection of Geographical Indications
Unit 4: Application Procedures.

BLOCK 3 WIPCO & GATT

Unit 1: International convention relating to Intellectual Property
Unit 2: Establishment of WIPO
Unit 3: Mission and Activities – History
Unit 4: General Agreement on Trade and Tariff

BLOCK 4 Indian IPR

Unit 1: Indian Position Vs WTO and Strategies
Unit 2: Indian IPR legislations
Unit 3: Draft of a national Intellectual Property Policy
Unit 4: Present against unfair competition

BLOCK 5 Case Studies

Unit 1: Case Studies on Patents
Unit 2: Copy writes and related rights – Trade Marks
Unit 3: Industrial design and Integrated circuits
Unit 4: Protection against unfair competition.

Books:

1. Subbaram N.R. " Handbook of Indian Patent Law and Practice ", S. Viswanathan (Printers and Publishers) Pvt. Ltd., 1998.
2. Eli Whitney, United States Patent Number : 72X, Cotton Gin, March 14, 1794.
3. Intellectual Property Today : Volume 8, No. 5, May 2001, [www.iptoday.com].
4. Using the Internet for non-patent prior art searches, Derwent IP Matters, July 2000. [www.ipmatters.net/features/000707_gibbs.html.

Subject Code : CEE 004

Subject Title : Housing Planning & Management

Structure of the Course Content

BLOCK 1 INTRODUCTION TO HOUSING

Unit 1: Definition of Basic Terms
Unit 2: Housing Policies
Unit 3: Housing Laws
Unit 4: Institutions for Housing at National, State and Local levels

BLOCK 2 HOUSING PROGRAMMES

Unit 1: Sites and Services, Neighbourhoods
Unit 2: Open Development Plots, Apartments, Rental Housing
Unit 3: Operative Housing, Slum Housing Programmes, Role of Public
Unit 4: Private and Non-Government Organisations

BLOCK 3 PLANNING AND DESIGN OF HOUSING PROJECTS

Unit 1: Formulation of Housing Projects
Unit 2: Site Analysis
Unit 3: Layout Design
Unit 4: Design of Housing Units

BLOCK 4 CONSTRUCTION TECHNIQUES

Unit 1: New Constructions Techniques
Unit 2: Cost Effective Modern Construction Materials
Unit 3: Cost Effective of Building Centers
Unit 4: Concept, Functions and Performance Evaluation

BLOCK 5 Housing Finance and Project Appraisal

Unit 1: Appraisal of Housing Projects
Unit 2: Housing Finance, Cost Recovery
Unit 3: Cash Flow Analysis, Subsidy
Unit 4: Pricing o f Housing Units, Rents, Recovery Pattern

Books:

1. Meera Mehta and Dinesh Mehta, Metropolitan Housing Markets, Sage Publications Pvt. Ltd., New Delhi, 1999.
2. Francis Cherunilam and Odeyar D Heggade, Housing in India, Himalaya Publishing House, Bombay, 1997.
3. Development Control Rules for Chennai Metropolitan Area, CMA, Chennai, 2002.
4. UNCHS, National Experiences with Shelter Delivery for the Poorest Groups, UNCHS (Habitat), Nairobi, 1994.
5. National Housing Policy, 1994, Government of India.

Subject Code : CEE 005

Subject Title : Management of Irrigation Systems

Structure of the Course Content

BLOCK 1 IRRIGATION SYSTEM REQUIREMENTS

Unit 1: Irrigation systems
Unit 2: Supply and demand of water
Unit 3: Estimation of total and peak crop water requirements
Unit 4: Effective and dependable rainfall – Irrigation efficiencies

BLOCK 2 IRRIGATION SCHEDULING

Unit 1: Time of irrigation
Unit 2: Critical stages of water need of crops
Unit 3: Criteria for scheduling irrigation
Unit 4: Frequency and interval of irrigation

BLOCK 3 MANAGEMENT

Unit 1: Structural strategies in water use and management
Unit 2: Non-structural strategies in water use and management
Unit 3: Conjunctive use of surface and ground waters
Unit 4: Quality of irrigation water

BLOCK 4 OPERATIONS

Unit 1: Operational plans
Unit 2: Main canals, laterals and field channels
Unit 3: Water control and regulating structures
Unit 4: Performance indicators and Case study

BLOCK 5 INVOLVEMENTS OF STAKE HOLDERS

Unit 1: Farmer's participation in System operation
Unit 2: Water user's associations – Farmer councils
Unit 3: Changing paradigms on irrigation management
Unit 4: Participatory irrigation management

Books:

2. Dilip Kumar Majumdar, "Irrigation Water Management – Principles and Practice", Prentice Hall of India Pvt. Ltd., New Delhi, 2000
3. Hand book on Irrigation Water Requirement, R.T. Gandhi, et. al., Water Management Division, Department of Agriculture, Ministry of Agriculture, New Delhi
4. Hand Book on Irrigation System Operation Practices, Water Resources Management and Training Project, Technical report No. 33, CWC, New Delhi, 1990
5. Maloney, C. and Raju, K.V., "Managing Irrigation Together", Practice and Policy in India, Stage Publication, New Delhi, India, 1994

Subject Code : CEE 006

Subject Title : Traffic Engineering Management

Structure of the Course Content

BLOCK 1 INTRODUCTION

Unit 1: Significance and scope, Characteristics of Vehicles and Road User
Unit 2: Skid Resistance and Braking Efficiency
Unit 3: Components of Traffic Engineering
Unit 4:Road, Traffic and Land Use Characteristics

BLOCK 2 TRAFFIC SURVEYS AND ANALYSIS

Unit 1: Surveys and Analysis
Unit 2: Volume, Capacity, Speed and Delays
Unit 3: Accident Studies and Safety Level of Services
Unit 4: Problems

BLOCK 3 TRAFFIC CONTROL

Unit 1: Traffic signs and Road markings
Unit 2: Design of Traffic signals and Signal co-ordination
Unit 3: Traffic control aids and Street furniture, Street Lighting
Unit 4: Computer applications in Signal design

BLOCK 4 GEOMETRIC DESIGNS OF INTERSECTIONS

Unit 1: Classification of Intersections
Unit 2: Chanallised and Unchanallised Intersection
Unit 3: Principles of Intersection Design, Elements of Intersection Design
Unit 4: Chanallisation and Rotary design (Problems),

BLOCK 5 TRAFFIC MANAGEMENT

Unit 1: Traffic System Management (TSM)
Unit 2: Traffic forecasting techniques
Unit 3: Traffic Segregation and Calming,
Unit 4: Introduction to Intelligence Transport System (ITS)

Books:

1. Khanna K and Justo C E G, Highway Engineering, Khanna Publishers, Roorkee, 2001.
2. Kadiyali L R, Traffic Engineering and Transport Planning, Khanna Technical Publications, Delhi, 2000.
3. Indian Roads Congress (IRC) specifications: Guidelines and special publications on Traffic Planning and Management
4. Guidelines of Ministry of Road Transport and Highways, Government of India.
5. Subhash C.Saxena, A Course in Traffic Planning and Design, Dhanpat Rai Publications, New Delhi, 1989.

Subject Code : CEE 007

Subject Title : Coastal Zone Management

Structure of the Course Content

BLOCK 1 COASTAL ZONE

Unit 1: Coastal zone regulations
Unit 2: Coastal waters
Unit 3: Wet lands and Lagoons
Unit 4: Living and Non living resources

BLOCK 2 WAVE DYNAMICS

Unit 1: Wave classification
Unit 2: Airy's Linear Wave theory
Unit 3: Wave energy – Wave Decay
Unit 4: Wave force on structures

BLOCK 3 WAVE FORECASTING AND TIDES

Unit 1: SMB and PNJ methods of wave forecasting
Unit 2: Classification of tides
Unit 3: Darwin's equilibrium theory of tides
Unit 4: Effects on structures

BLOCK 4 COASTAL PROCESSES

Unit 1: Erosion and depositional shore features
Unit 2: Methods of protection
Unit 3: Littoral currents – Coastal aquifers
Unit 4: Impact of sewage disposal in seas

BLOCK 5 HARBOURS

Unit 1: Classification of harbours
Unit 2: Requirements of a modern port
Unit 3: Types and selection of break waters
Unit 4: Need and mode of dredging

Books:

1. Richard Sylvester, "Coastal Engineering, Volume I and II", Elseiner Scientific Publishing Co., 1999
2. Quinn, A.D., "Design & Construction of Ports and Marine Structures", McGraw-Hill Book Co., 1999
3. Ed. A.T. Ippen, "Coastline Hydrodynamics", McGraw-Hill Inc., New York, 1993
4. Dwivedi, S.N., Natarajan, R and Ramachandran, S., "Coastal Zone Management in Tamilnadu"

Subject Code : CEE 008
Subject Title : Air Pollution Management
Structure of the Course Content

BLOCK 1 SOURCE AND EFFECTS OF AIR POLLUTANTS

Unit 1: Classification of air pollutants
Unit 2: Sources of air pollution
Unit 3: Effects of air pollution on human
Unit 4: Sampling and Analysis

BLOCK 2 DISPERSION OF POLLUTANTS

Unit 1: Elements of atmosphere
Unit 2: Meteorological factors
Unit 3: Wind roses – Lapse rate
Unit 4: Dispersion of pollutants and models

BLOCK 3 AIR POLLUTION CONTROL

Unit 1: Principles and design of control measures
Unit 2: Particulates control by gravitational, centrifugal, filtration, scrubbing
Unit 3: Selection criteria for equipment
Unit 4: Pollution control for specific major industries

BLOCK 4 AIR QUALITY MANAGEMENT

Unit 1: Air quality standards
Unit 2: Air quality monitoring
Unit 3: Air pollution control efforts
Unit 4: Town planning regulation of new industries

BLOCK 5 NOISE POLLUTION

Unit 1: Sources of noise pollution
Unit 2: Effects
Unit 3: Control methods
Unit 4: Prevention

Books:

1. Anjaneyulu, D., "Air Pollution and Control Technologies", Allied Publishers, Mumbai, 2002.
2. Rao, C.S. Environmental Pollution Control Engineering, Wiley Eastern Ltd., New Delhi, 1996.
3. Rao M.N., and Rao H. V. N., Air Pollution Control, Tata-McGraw-Hill, New Delhi, 1996.
4. W.L.Heumann, Industrial Air Pollution Control Systems, McGraw-Hill, New Yark, 1997
5. Mahajan S.P., Pollution Control in Process Industries, Tata McGraw-Hill Publishing Company, New Delhi, 1991.
6. Peavy S.W., Rowe D.R. and Tchobanoglous G. Environmental Engineering, McGraw Hill, New Delhi, 1985.
7. Garg, S.K., "Environmental Engineering Vol. II", Khanna Publishers, New Delhi
8. Mahajan, S.P., "Pollution Control in Process Industries", Tata McGraw-Hill, New Delhi, 1991