

**COURSE STRUCTURE
AND
DETAILED SYLLABUS**

for

II B.TECH

CIVIL ENGINEERING

(Applicable for the batches admitted from 2016-17)



CONTENTS

Sl. No.	Sub. Code	Particulars /Name of the Subject	Page No.
1.		COURSE STRUCTURE	3

II YEAR I SEMESTER

Detailed Syllabus			
1	HM0313	Probability and Statistics	4
2	CE0341	Strength of Materials-1	6
3	CE0321	Building Materials, Construction & Planning	8
4	CE0322	Surveying	10
5	CE0343	Fluid Mechanics	12
6	CE0344	Computer Aided drafting Lab-1	14
7	CE0342	Strength of Materials Lab	15
8	CE0323	Surveying Lab-1	17
9	GN0392	Human Values and Professional Ethics	18

II YEAR II SEMESTER

Detailed Syllabus			
1	CE0441	Strength of Materials – II	20
2	CE0442	Hydraulics & Hydraulic Machinery	22
3	CE0444	Structural Analysis –I	24
4	CE0421	Engineering Geology	26
5	CE0445	Environmental Engineering	28
6	GN0491	Gender Sensitization	30
7	CE0422	Engineering Geology Lab	33
8	CE0446	Environmental Engineering Lab	34
9	CE0443	Fluid Mechanics & Hydraulic Machinery lab	35

**COURSE STRUCTURE
II B.Tech- Civil Engineering**

II Year I SEMESTER (CE)

Subject Code	Group	Subject	L	T	P	Credits
HM0313	PC	Probability and Statistics	4	1	0	3
CE0341	PC	Strength of Materials-1	4	1	0	4
CE0321	ES	Building Materials, Construction & Planning	4	0	0	3
CE0322	ES	Surveying	4	1	0	4
CE0343	PC	Fluid Mechanics	4	1	0	3
CE0344	PC	Computer Aided drafting Lab-1	0	0	3	2
CE0342	PC	Strength of Materials Lab	0	0	3	1
CE0323	ES	Surveying Lab-1	0	0	3	2
GN0392	HS	Human Values and Professional Ethics	2	0	0	2
Total Credits						24

I Year II SEMESTER (CE)

Subject Code	Group	Subject	L	T	P	Credits
CE0441	PC	Strength of Materials – II	4	1	0	4
CE0442	PC	Hydraulics & Hydraulic Machinery	4	1	0	4
CE0444	PC	Structural Analysis –I	4	1	0	4
CE0421	ES	Engineering Geology	4	0	0	3
CE0445	PC	Environmental Engineering	4	1	0	4
GN0491	HS	Gender Sensitization	0	2	0	0
CE0422	ES	Engineering Geology Lab	0	0	3	1
CE0446	PC	Environmental Engineering Lab	0	0	3	2
CE0443	PC	Fluid Mechanics & Hydraulic Machinery lab	0	0	3	2
Total Credits						24

II Year B. Tech. I Sem

L T P C
4 1 0 3

(HM0313) PROBABILITY AND STATISTICS

Pre Requisites: Mathematic - I

Objectives:

To make the student to understand the statistics and probability theories such as random variables, sampling distribution, tests of significance etc. so that he can apply them to engineering problems.

Outcomes:

Students will able to perform probability theories & statistics on engineering problems

Syllabus:

UNIT-I: Probability

Sample space and events – Probability – The axioms of probability – Some Elementary theorems – Conditional probability – Baye,s theorem, Random variables – Discrete and continuous.

UNIT-II: Single Random variables and probability distributions

Random variables – Discrete and continuous. Probability distributions, mass function/ density function of a probability distribution . Mathematical Expectation, Moment about origin, Central moments Moment generating function of probability distribution. Binomial , Poisson & normal distributions and their properties . Moment generating functions of the above three distributions. and hence finding the mean and variance.

UNIT-III: Multiple Random variables, Correlation & Regression

Joint probability distributions- Joint probability mass / density function, Marginal probability mass / density functions, Covariance of two random variables, Correlation - Coefficient of correlation, The rank correlation.

Regression- Regression Coefficient, The lines of regression and multiple correlation & regression.

UNIT-IV: Sampling Distributions and Testing of Hypothesis

Sampling:Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of variance.

Parameter estimations – likelihood estimate, interval estimations .

Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, & type II errors – critical region, confidence interval, Level of significance. One sided test, Two sided test,

Large sample tests:

(i) Test of Equality of means of two samples equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)

(ii) Tests of significance of difference between sample S.D and population S.D.

(iii) Tests of significance difference between sample proportion and population proportion & difference between two sample proportions.

Small sample tests:

Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples

Snedecor's F- distribution and its properties. Test of equality of two population variances

Chi-square distribution, its properties, Chi-square test of goodness of fit

UNIT- V: Queuing Theory & Stochastic Processes

Arrival Theorem – Pure Birth process and Death process M/M/1 Model. Introduction to Stochastic Processes – Markov process classification of states – Examples of Markov Chains, Stochastic Matrix, limiting probabilities.

Text Books:

- 1) Fundamentals Of Mathematical Statistics By S C Gupta And V.K.Kapoor
- 2) Probability And Statistics For Engineers And Scientists By Sheldon M.Ross, Academic Press
- 3) Probability And Statistics For Engineering And The Sciencec By Jay L.Devore.

References:

- 1) Mathematics For Engineers Series –Probability Statistics And Stochastic Process By K.B.Datta And M.A S.Srinivas, Cengage Publications
- 2) Probability, Statistics And Stochastic Process By Prof.A R K Prasad., Wiley India
- 3) Probability And Statistics By T.K.V.Iyengar & B.Krishna Gandhi Etel
- 4) A Text Book Of Probability And Statistics, Shahnaz Bathul , Cengage Learning

II Year B. Tech. I Sem

L T P C
4 1 0 4

(CE0341) STRENGTH OF MATERIALS – I

Pre Requisites: Engineering Mechanics

Objectives:

The subject provide the knowledge of simple stress strains flexural stresses in members, shear stresses and deflection in beams so that the concepts can be applied to the Engineering problems.

Outcomes:

Student can able to find out the bending moments, shear force diagram shear stresses and deflection in beams to the engineering problems

Syllbus:

UNIT – I

SIMPLE STRESSES AND STRAINS:

Elasticity and plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses. Elastic constants.

STRAIN ENERGY – Resilience – Gradual, sudden, impact and shock loadings – simple applications.

UNIT – II

SHEAR FORCE AND BENDING MOMENT :

Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed load, uniformly varying loads and combination of these loads – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam.

UNIT – III

FLEXURAL STRESSES:

Theory of simple bending – Assumptions – Derivation of bending equation: $M/I = f/y = E/R$ - Neutral axis – Determination of bending stresses – Section modulus of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections.

SHEAR STRESSES:

Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections.

UNIT – IV

DEFLECTION OF BEAMS:

Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L, Uniformly varying load-Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

CONJUGATE BEAM METHOD: Introduction – Concept of conjugate beam method. Difference between a real beam and a conjugate beam. Deflections of determinate beams with constant and different moments of inertia.

UNIT – V

PRINCIPAL STRESSES AND STRAINS:

Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear – Mohr's circle of stresses – Principal stresses and strains – Analytical and graphical solutions.

THEORIES OF FAILURE: Introduction – Various theories of failure - Maximum Principal Stress Theory, Maximum Principal Strain Theory, Maximum shear stress theory- Strain Energy and Shear Strain Energy Theory (Von Mises Theory).

Text Books:

- 1) Strength of Materials by R.K.Bansal, Lakshmi Publications House Pvt. Ltd (2017).
- 2) Strength of Materials by R.K Rajput, S.Chand & Company Ltd (2015).

References:

- 1) Strength of Materials by S.S.Bhavikatti, Vikas Publishing House Pvt. Ltd (2013).
- 2) Mechanics of Structures Vol –I by H.J.Shah and S.B.Junnarkar, Charotar Publishing House Pvt. Ltd (2014).
- 3) Strength of Materials by D.S Prakash Rao, Universities Press Pvt. Ltd (1999).
- 4) Strength of Materials by S.S.Rattan, Tata McGraw Hill Education Pvt. Ltd (2008).
- 5) Fundamentals of Solid Mechanics by M.L.Gambhir, PHI Learning Pvt. Ltd (2009).
- 6) Strength of Materials and Structures by John Case *et al.*, Butterworth-Heinemann(1959).
- 7) Strength of Materials by R.Subramanian, Oxford University Press (2011).

II Year B. Tech. I Sem

L T P C
4 0 0 3

(CE0321) BUILDING MATERIALS, CONSTRUCTION AND PLANNING

Pre Requisites: Engineering Mechanics

Objectives:

To give the students a basic idea about the construction materials, building components and to introduce component methodologies.

Outcomes:

Student able to identify various building materials to perform construction & planning

Syllabus:

UNIT – I

Stones and Bricks, Tiles:

Building stones – classifications and quarrying – properties – structural requirements – dressing

Bricks – Composition of Brick earth – manufacture and structural requirements.

Wood, Aluminum, Glass and Paints

Wood - structure – types and properties – seasoning – defects; alternate materials for wood – GI / fiber – reinforced glass bricks, steel & aluminum.

UNIT-II

Cement & Admixtures:

Ingredients of cement – manufacture – Chemical composition – Hydration - field & lab tests

Admixtures – mineral & chemical admixtures – uses.

UNIT-III

Building Components:

Lintels, Arches, walls, vaults – stair cases – types of floors, types of roofs – flat, curved, trussed ; foundations – types ; Damp Proof Course ; Joinery – doors – windows – materials – types.

Building Services:

Plumbing Services: Water Distribution, Sanitary – Lines & Fittings; Ventilations: Functional requirements systems of ventilations. Air-conditioning - Essentials and Types

; Acoustics – characteristic – absorption – Acoustic design ; Fire protection – Fire Hazards – Classification of fire resistant materials and constructions

UNIT -IV

Masonry and Finishing's

Brick masonry – types – bonds ; Stone masonry – types ; Composite masonry – Brick-stone composite ; Concrete, Reinforced brick.

Finishers : Plastering, Pointing, Painting, Claddings – Types – Tiles - ACP

Form work :

Requirements – Standards – Scaffolding – Design ; Shoring, Underpinning.

UNIT –V

Building Planning: Principles of Building Planning, Classification of buildings and Building by laws.

Text Books:

1. Building Materials and Construction – Arora & Bindra, Dhanpat Roy Publications (2010)
2. Building Construction by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd., New Delhi. (2005)

References:

1. Building Materials by Duggal, New Age International. (2012)
2. Building Materials by P.C.Varghese, PHI. (2015)
3. Building Construction by PC Varghese PHI. (2009)
4. Construction Technology – Vol – I & II by R. Chuddy, Longman UK.
5. Basics of Civil Engg by Subhash Chander; Jain Brothers
6. Alternate Building materials and Technology, K.S.Jagadish, Venkatarama Reddy and others; New Age Publications (2009)

II Year B. Tech. I Sem

L T P C
4 1 0 4

(CE0322) SURVEYING

Pre Requisites: Engineering Mechanics

Objectives:

The first step in engineering practice is surveying and the soundness of the any civil engineering work is dependent on the reliability and accuracy of the surveying. Therefore, it is imperative that a student of engineering should have good knowledge of surveying. To impart the knowledge of surveying and latest technologies in surveying it is necessary to introduce this subject in the curriculum.

Outcomes:

Able to perform various surveying techniques using latest technologies in surveying

Syllabus:

Unit-I:

Introduction and Basic Concepts

Introduction, Objectives, classification and principles of surveying, Scales, Shrinkage of Map, Conventional symbols and Code of Signals, Surveying accessories, phases of surveying.

Measurement of Distances and Directions

Linear distances- Approximate methods, Direct Methods- Chains- Tapes, ranging, Tape corrections, Indirect methods- optical methods- E.D.M. method.

Prismatic Compass- Bearings, included angles, Local Attraction, Magnetic Declination and dip

Unit-II

Leveling and Contouring

Leveling- Basics definitions, types of levels and leveling staves, temporary adjustments, methods of leveling, booking and Determination of levels- HI Method-Rise and Fall method, Effect of Curvature of Earth and Refraction.

Contouring- Characteristics and uses of Contours, Direct & Indirect methods of contour surveying, interpolation and sketching of Contours.

Computation of Areas and Volumes

Areas- Determination of areas consisting of irregular boundary and regular boundary (coordinates, MDM, DMD methods), Planimeter.

Volumes- Computation of areas for level section and two level sections with and without transverse slopes, determination of volume of earth work in cutting and embankments, volume of borrow pits, capacity of reservoirs.

Unit-III

Theodolite Surveying

Types of Theodolites, Fundamental Lines, temporary adjustments, measurement of horizontal angle by repetition method and reiteration method, measurement of vertical Angle, Trigonometrical leveling when base is accessible and inaccessible.

Traversing

Methods of traversing traverse computations and adjustments, Gale's traverse table, Omitted measurements.

Unit-IV

Tachometric Surveying

Principles of Tacheometry,stadia and tangential methods of Tacheometry.

Curves

Types of curves and their necessity, elements of simple curve, setting out of simple Curves, Introduction to compound curves.

Unit-V

Modern Surveying Methods

Total Station and Global Positioning System. : Basic principles, classifications, applications, comparison with conventional surveying. Electromagnetic wave theory - electromagnetic distance measuring system - principle of working and EDM instruments, Components of GPS – space segment, control segment and user segment, reference systems, satellite orbits, GPS observations. Applications of GPS.

Text Books:

1. Chandra A M, "Plane Surveying", New age International Pvt. Ltd., Publishers, New Delhi, 2002.
2. Chandra A M, "Higher Surveying", New age International Pvt. Ltd., Publishers, New Delhi, 2002.
3. Duggal S K, "Surveying (Vol – 1 & 2), Tata Mc.Graw Hill Publishing Co. Ltd. New Delhi, 2004.
4. Hoffman.B, H.Lichtenegga and J.Collins, Global Positioning System - Theory and Practice, Springer -Verlag Publishers, 2001.

References:

1. Arthur R Benton and Philip J Taety, Elements of Plane Surveying, McGraw Hill – 2000
2. Arora K R "Surveying Vol 1, 2 & 3), Standard Book House, Delhi, 2004
3. Surveying (Vol – 1, 2 & 3), by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi
4. Surveying and levelling by R. Subramanian, Oxford university press, New Delhi
5. Surveying by BHAVIKATTI; Vikas publishing house ltd.

II Year B. Tech. I Sem

L T P C
4 1 0 3

(CE0343) FLUID MECHANICS

Pre Requisites: Engineering Mechanics

Objectives:

This subject introduces the basic concepts of fluids, their behavioral properties, analyzing the fluid flows using primary equations. This subject further deals with various flow measuring devices and concepts of boundary layer flows.

Outcomes: Engineering Mechanics

Syllabus:

UNIT I

INTRODUCTION : Dimensions and units – Physical properties of fluids specific gravity, viscosity, surface tension, vapour pressure and their influences on fluid motion pressure at a point, Pascal's law, Hydrostatic law - atmospheric, gauge and vacuum pressure-measurement of pressure. Pressure gauges, Manometers: differential and simple Manometers. Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Center of pressure. Derivations and problems.

UNIT – II

FLUID KINEMATICS: Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows : Steady, unsteady, uniform, nonuniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two , three dimensional flows – stream and velocity potential functions, flow net analysis.

UNIT – III

FLUID DYNAMICS and Measurement of Flow: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, (Navier – stokes equations (Explanatory) Momentum equation and its application – forces on pipe bend. Pitot tube, Venturi meter and orifice meter – classification of orifices, flow over rectangular, triangular and trapezoidal and stepped notches - –Broad crested weirs

UNIT - IV

CLOSED CONDUIT FLOW: Reynold's experiment – Characteristics of Laminar & Turbulent flows. Laws of Fluid friction – Darcy's equation, ,variation of friction factor with Reynold's number – Moody's Chart, Minor losses – pipes in series – pipes in parallel –

Total energy line and hydraulic gradient line. Pipe network problems Flow between parallel plates, Flow through long tubes, flow through inclined tubes.

UNIT – V

BOUNDARY LAYER THEORY: Approximate Solutions of Navier Stoke's Equations – Boundary layer – concepts, Prandtl contribution, Characteristics of boundary layer along a thin flat plate, Vonkarmen momentum integral equation, laminar and turbulent Boundary layers (no derivations) BL in transition, separation of BL, control of BL, flow around submerged objects-Drag and Lift- Magnus effect.

Text Books:

1. Fluid Mechanics by Modi and Seth, Standard book house. (2013)
2. Introduction to Fluid Machines by S.K.Som & G.Biswas (Tata Mc.Grawhill publishers Pvt. Ltd.) (2011)
3. Introduction to Fluid Machines by Edward J. Shaughnessy, Jr, Ira M. Katz and James P. Schaffer , Oxford University Press, New Delhi (2005)

References:

1. Fluid Mechanics by J.F.Douglas, J.M. Gaserek and J.A.Swaffird (Longman) (2011)
2. Fluid Mechanics by Frank.M. White (Tata Mc.Grawhill Pvt. Ltd.) (2011)
3. Fluid Mechanics by A.K. Mohanty, Prentice Hall of India Pvt. Ltd., New Delhi (2002)
4. A text of Fluid mechanics and hydraulic machines by Dr. R.K. Bansal - Laxmi Publications (P) ltd., New Delhi. (2011)
5. Fluid Mechanics (including hydraulic machines)by Dr.A.K Jain,Khanna Publishers (2008).

II Year B. Tech. I Sem

L	T	P	C
0	0	3	2

(CE0344) COMPUTER AIDED DRAFTING LAB-I

Pre Requisites: Engineering Mechanics

Objectives:

The object of this lab is to teach the student basic drawing fundamentals in various civil engineering applications, specially in building drawing.

Outcomes:

Student will be able to master the usage of autocad commands for drawing 2D & 3D building drawings and also the usage autocad for different civil engg applications.

Syllabus:

1. Introduction to computer aided drafting
2. Software for CAD – Introduction to different softwares
3. Practice exercises on CAD software
4. Drawing of plans of buildings using software
 - a) Single storied buildings
 - b) multi storied buildings
5. Developing sections and elevations for
 - a) Single storied buildings
 - b) multi storied buildings
6. Detailing of building components like Doors, Windows, Roof Trusses etc. using CAD softwares
7. Exercises on development of working drawings of buildings

Text Books:

1. Computer Aided Design Laboratory by M. N. Sessa Praksh & Dr. G. S. Servesh – Laxmi Publications. (2016)
2. Engineering Graphics by P. J. Sha – S. Chand & Co. (2014)

II Year B. Tech. I Sem

L	T	P	C
0	0	3	1

(CE0342) STRENGTH OF MATERIALS LAB

Pre Requisites: Strength of Materials – Theory

Objectives:

The object of the course to make the student to understand the behavior of materials under different types of loading for different types structures

Outcomes:

Able to identify the various properties of engineering material.

Syllabus:

1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges
12. Continuous beam – deflection test.

List of Major Equipment:

1. UTM for conducting tension test on rods
2. Steel beam for flexure test
3. Wooden beam for flexure test
4. Torsion testing machine
5. Brinnell's / Rock well's hardness testing machine
6. Spring testing machine
7. Compression testing machine
8. Izod Impact machine
9. Shear testing machine
10. Beam setup for Maxwell's theorem verification.
11. Continuous beam setup
12. Electrical Resistance gauges.

II Year B. Tech. I Sem

L	T	P	C
0	0	3	2

(CE0323) SURVEYING LAB –I

Pre Requisites: Surveying Theory

Objectives:

To impart the practical knowledge in the field, it is essential to introduce in curriculum. Drawing of Plans and Maps and determining the area are pre requisites before taking up any Civil Engineering works.

Outcomes:

Practically able to give drawing of plans & maps & determining the area before taking up any civil engineering works.

Syllabus:

1. Surveying of an area by chain survey (closed traverse) & plotting.
2. Chaining across obstacles
3. Determine of distance between two inaccessible points with compass
4. Survey of a given area by prismatic compass (closed traverse) and plotting after adjustment.
5. Radiation method, intersection methods by plane table survey.
6. Two point and three point problems in plane table survey.
7. Levelling – Longitudinal and cross-section and plotting
8. Trigonometric leveling using theodolite
9. Height and distances using principles of tacheometric surveying
10. a) Measurement of Horizontal angle & vertical angle.
b) Distance between inaccessible point by theodolite

II Year B. Tech. I Sem

L T P C
2 0 0 2

(GN0392) HUMAN VALUES AND PROFESSIONAL ETHICS

Pre Requisites: NIL

Objectives:

The object of subject is to develop personality development, professional responsibility in Engineering, have knowledge about rights, global issues

Outcomes:

Student will be perfect with human values up professional ethics which is essential in any kind of work in engineering field

Syllabus:

Unit I

Human Values: Morals, values, ethics – integrity – work ethics –service learning –civic virtue – respect for others- living peacefully - Caring –sharing –honesty – courage – valuing time – cooperation – commitment –empathy – self-confidence –spirituality – character- Mini-Cases

Unit II

Professional Ethics: Profession- and professionalism - Two models of professionalism –Professional etiquette -Three types of Ethics or morality Responsibility in Engineering – Engineering standards –Engineering Ethics – Positive and Negative Faces. Professional Codes and Code of conduct (as given by ASME, ASCE, IEEE, IETE, Institute of Engineers as Guidelines for ethical conduct). Mini-cases.

Unit III

Professional Responsibilities: Ethical standards Vs Professional Conduct – Zero Tolerance for Culpable Mistakes – Hazards and Risks- Risk benefit analysis– congeniality, collegiality and loyalty. Respect for authority – conflicts of interest – occupational crime —Mini-Cases.

Unit IV

Professional Rights: professional rights and employee rights communicating risk and public policy – Whistle blowing - collective bargaining. Professionals /engineers as managers, advisors, experts, witnesses and consultants – moral leadership- Regulatory compliances, Monitoring and control- Mini-Cases

Unit V

Ethics in global context: Global issues in MNCs- Problems of bribery, extortion, and grease payments – Problem of nepotism, excessive gifts – paternalism – different business practices – negotiating taxes. Mini-Cases.

Mini-projects

Project 1: The student of this course should invariably attend (or watch on internet/any TV channel/youtube/social media) two speeches of 30 minutes duration each dealing with spiritual discourse and submit a report on the contents of the lecture proceedings.

Project 2: Visit any organization (including shops/ hotels or shopping malls in your region) of your choice and observe how the professionals perform the given job with a focus on professional ethics and human values.

References:

1. Aryasri, Human Values and Professional Ethics, Maruthi Publications.
2. S B George, Human Values and Professional Ethics, Vikas Publishing.
3. KR Govindan & Saenthil Kumar: Professional Ethics and Human Values, Anuradha Publications.
4. S K Chakraborty & D.Chakraborty: Human Values and Ethics, Himalaya.
5. M. Govindarajan, S. Natarajan, & V.S. Senthilkumar: Engineering Ethics(Includes Human Values), HI Learning Pvt. Ltd., New Delhi – 110001

II Year B. Tech. II Sem

L T P C
4 1 0 4

(CE0441) STRENGTH OF MATERIALS – II

Pre Requisites: Strength of Materials -I

Objectives:

Study of the subject provides the understanding of principal stress, strains, springs, columns and structures.

Outcomes: Students will be able to know the principles for practical design of columns, curved beams, springs, thick & thin cylinders, circular shafts etc.

Syllabus:

UNIT – I

TORSION OF CIRCULAR SHAFTS:

Theory of pure torsion – Derivation of Torsion equations : $T/J = q/r = N\theta/L$ – Assumptions made in the theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending and torsion and end thrust – Design of shafts according to theories of failure.

SPRINGS

Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel – Carriage or leaf springs.

UNIT – II

COLUMNS AND STRUTS:

Introduction – Types of columns – Short, medium and long columns – Axially loaded compression members – Crushing load – Euler's theorem for long columns- assumptions- derivation of Euler's critical load formulae for various end conditions – Equivalent length of a column – slenderness ratio – Euler's critical stress – Limitations of Euler's theory – Rankine – Gordon formula – Long columns subjected to eccentric loading – Secant formula – Empirical formulae – Straight line formula – Prof. Perry's formula.

BEAM COLUMNS: Laterally loaded struts – subjected to uniformly distributed and concentrated loads – Maximum B.M. and stress due to transverse and lateral loading.

UNIT - III

DIRECT AND BENDING STRESSES:

Stresses under the combined action of direct loading and bending moment, core of a section – determination of stresses in the case of chimneys, retaining walls and dams –

conditions for stability – stresses due to direct loading and bending moment about both axis.

BEAMS CURVED IN PLAN:

Introduction – circular beams loaded uniformly and supported on symmetrically placed Columns – Semi-circular beam simply-supported on three equally spaced supports.

UNIT – IV

THIN CYLINDERS:

Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Thin spherical shells.

THICK CYLINDERS:

Introduction - Lamé's theory for thick cylinders – Derivation of Lamé's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

UNIT – V

UNSYMMETRICAL BENDING:

Introduction – Centroidal principal axes of section – Graphical method for locating principal axes – Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis - Deflection of beams under unsymmetrical bending.

SHEAR CENTRE: Introduction - Shear centre for symmetrical and unsymmetrical (channel, I, T and L) sections

Text Books:

- 1) Strength of Materials by R.K.Bansal, Lakshmi Publications House Pvt. Ltd (2017).
- 2) Strength of Materials by R.K Rajput, S.Chand & Company Ltd.

References:

- 1) Fundamentals of Solid Mechanics by M.L.Gambhir, PHI Learning Pvt. Ltd (2009).
- 2) Introduction to Strength of Materials by U.C.Jindal, Galgotia Publications Pvt. Ltd (2001).
- 3) Mechanics of Materials by R.C.Hibbeler, Pearson Education (2016).
- 4) Strength of Materials by D.S Prakash Rao, Universities Press Pvt. Ltd (1999).
- 5) Strength of Materials by S.S.Rattan, Tata McGraw Hill Education Pvt. Ltd (2009).
- 6) Strength of Materials by R.Subramanian, Oxford University Press.
- 7) Mechanics of Materials by Ferdinand P. Beer *et al.*, Tata McGraw Hill Education Pvt. Ltd (2005).

II Year B. Tech. II Sem

L T P C
4 1 0 4

(CE0442) HYDRAULICS & HYDRAULIC MACHINERY

Pre Requisites: Fluid Mechanics

Objectives:

The main objective of this course to deal with the concepts of flow through open channels and their applications and the principles of hydraulic machines and hydraulic models

Outcomes:

Students will be able to know about the flow through open channels & also practical applications of hydraulic mechanics important of hydraulic models.

Syllabus:

UNIT – I

OPEN CHANNEL FLOW: Types of flows - Type of channels – Velocity distribution – Energy and momentum correction factors – Chezy's, Manning's; and Bazin formulae for uniform flow – Most Economical sections. Critical flow: Specific energy-critical depth – computation of critical depth – critical sub-critical and super critical flows. Non uniform flow-Dynamic equation for G.V.F., Mild, Critical, Steep, horizontal and adverse slopes-surface profiles-direct step method- Rapidly varied flow, hydraulic jump, energy dissipation.

UNIT - II

HYDRAULIC SIMILITUDE: Dimensional analysis-Rayleigh's method and Buckingham's pi theorem-study of Hydraulic models – Geometric, kinematic and dynamic similarities-dimensionless numbers – model and prototype relations. Distorted and non-distorted models.

UNIT – III

BASICS OF TURBO MACHINERY: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency-Angular momentum principle, Applications to radial flow turbines.

UNIT - IV

HYDRAULIC TURBINES: Layout of a typical Hydropower installation – Heads and efficiencies-classification of turbines-pelton wheel-Francis turbine-Kaplan turbine-working, working proportions, velocity diagram, work done and efficiency, hydraulic design, draft tube – theory and function efficiency. Governing of turbines-surge tanks-unit and specific turbines-unit speed-unit quantity-unit power-specific speed performance characteristics-geometric similarity-cavitation.

UNIT – V

CENTRIFUGAL PUMP: installation details-classification-types work done- Manometric head-minimum starting speed-losses and efficiencies-specific speed multistage pumps-pumps in parallel- performance of pumps-characteristic curves- NPSH-cavitation.

Classification of Hydropower plants – Definition of terms – load factor, utilization factor, capacity factor, estimation of hydropower potential.

Text Books:

1. Open Channel flow by K,Subramanya . Tata Mc. Graw-Hill Publishers (2008)
2. A text of Fluid mechanics and hydraulic machines by Dr. R.K. Bansal - Laxmi Publications (P) Ltd., New Delhi (2011)
3. Fluid Mechanics & Fluid Power Engineering by D.S. Kumar Kataria & Sons. (2016)

References:

1. Fluid Mechanics, Hydraulic and Hydraulic Machines by Modi & Seth, Standard book house. (2013)
2. Elements of Open channel flow by Ranga Raju, Tata McGraw Hill, and Publications.
3. Fluid mechanics and hydraulic machines by R.K. Rajput, S.Chand &Co. (2015)
4. Open Channel flow by V.T.Chow, McGraw Hill book company. (1988)
5. Hydraulic Machines by Banga & Sharma Khanna Publishers. (1995)
6. Fluid Mechanics (including hydraulic machines)by Dr.A.K Jain, Khanna Publishers (2008)

II Year B. Tech. II Sem

L T P C
4 1 0 4

(CE0444) STRUCTURAL ANALYSIS – I

Pre Requisites: Strength of Materials –I

Objectives:

To make the students to understand the principles of analysis of structures subjected to static and moving loads by various methods.

Outcomes:

Students will be able to know the response of structures subjected to static & moving loads.

Syllabus:

UNIT – I

ANALYSIS OF PERFECT FRAMES: Types of frames- Perfect, Imperfect and Redundant pin jointed frames. - Analysis of determinate pin jointed frames using method of joints, method of sections and tension coefficient method for vertical loads, horizontal loads and inclined loads.

UNIT – II

ENERGY THEOREMS: Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces - Castigliano's first theorem-Unit Load Method. Deflections of simple beams and pin- jointed plane trusses. Deflections of statically determinate bent frames.

THREE HINGED ARCHES – Introduction – Types of Arches – Comparison between Three hinged and two hinged Arches. Linear Arch. Eddy's theorem. Analysis of Three hinged arches. Normal Thrust and radial shear in an arch. Geometrical properties of parabolic and circular arch. Three hinged circular arch at different levels. Absolute maximum bending moment diagram for a three hinged arch.

UNIT-III

PROPPED CANTILEVER and FIXED BEAMS: Determination of static and kinematic indeterminacies for beams- Analysis of Propped cantilever and fixed beams, including the beams with different moments of inertia, subjected to uniformly distributed load, central point load, eccentric point load, number of point loads, uniformly varying load,

couple and combination of loads - Shear force and Bending moment diagrams for Propped Cantilever and Fixed Beams-Deflection of Propped cantilever and fixed beams; effect of sinking of support, effect of rotation of a support.

UNIT – IV

CONTINUOUS BEAMS: Introduction-Continuous beams. Clapeyron's theorem of three moments- Analysis of continuous beams with constant and variable moments of inertia with one or both ends fixed-continuous beams with overhang. Effects of sinking of supports.

SLOPE DEFLECTION METHOD: Derivation of slope-deflection equation, application to continuous beams with and without settlement of supports. Determination of static and kinematic indeterminacies for frames. Analysis of Single Bay – Single storey Portal Frames by Slope Deflection Method Including Side Sway. Shear force and bending moment diagrams and Elastic curve.

UNIT – V

MOVING LOADS and INFLUENCE LINES: Introduction maximum SF and BM at a given section and absolute maximum S.F. and B.M due to single concentrated load U.D load longer than the span, U.D load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length. Definition of influence line for SF, Influence line for BM- load position for maximum SF at a section-Load position for maximum BM at a section - Point loads, UDL longer than the span, UDL shorter than the span- Influence lines for forces in members of Pratt and Warren trusses. Equivalent uniformly distributed load. Focal length.

Text Books:

- 1) Structural Analysis Vol –I & II by V.N.Vazirani and M.M.Ratwani, Khanna Publishers.
- 2) Structural Analysis Vol I & II by G.S.Pandit and S.P.Gupta, Tata McGraw Hill Education Pvt. Ltd.
- 3) Basic Structural Analysis by K.U.Muthu *et al.*, I.K.International Publishing House Pvt.Ltd.

References:

- 1) Structural Analysis by R.C.Hibbeler, Pearson Education
- 2) Mechanics of Structures Vol – I and II by H.J.Shah and S.B.Junnarkar, Charotar Publishing House Pvt. Ltd.
- 3) Structural Analysis by Devdas Menon, Narosa Publishing House.
- 4) Basic Structural Analysis by C.S.Reddy., Tata McGraw Hill Education Pvt. Ltd.
- 5) Fundamentals of Structural Analysis by M.L.Gamhir, PHI Learning Pvt. Ltd
- 6) Structural Analysis -I by S.S.Bhavikatti, Vikas Publishing House Pvt. Ltd.

II Year B. Tech. II Sem

L T P C
4 0 0 3

(CE0421) ENGINEERING GEOLOGY

Pre Requisites: Building Materials

Objectives:

The objectives of course are to give the basic knowledge of Geology that is required for constructing various Civil Engineering Structures. The syllabus include basic Geology, Geological Hazardous and Environmental Geology which gives a complete picture on the Geological aspects that are to be considered for the planning and construction of major Civil Engineering projects

Outcomes:

Student will acquire basic knowledge of geology.

Syllabus:

UNIT - I

INTRODUCTION: Importance of geology from Civil Engineering point of view. Brief study of case histories of failure of some Civil Engineering constructions due to geological draw backs. Importance of Physical geology, Petrology and Structural geology.

WEATHERING OF ROCKS: Its effect over the properties of rocks importance of weathering with REFERENCE to dams, reservoirs and tunnels weathering of common rock like “Granite”

UNIT - II

MINERALOGY: Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Advantages of study of minerals by physical properties. Role of study of physical properties of minerals in the identification of minerals. Study of physical properties of following common rock forming minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Study of other common economic minerals such as Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Magnesite and Bauxite.

PETROLOGY: Definition of rock: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks. Dykes and sills, common structures and textures of igneous. Sedimentary and metamorphic rocks. Their distinguishing features, Megascopic and microscopic and microscopic study of Granite, Dolerite, Basalt, Pegmatite, Laterite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT - III

STRUCTURAL GEOLOGY: Outcrop, strike and dip study of common geological structures associating with the rocks such as folds, faults unconformities, and joints - their important types and case studies. Their importance Insitu and drift soils, common types of soils, their origin and occurrence in India, Stabilization of soils. Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration.

UNIT - IV

EARTH QUAKES: Causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Landslides, their causes and effect; measures to be taken to prevent their occurrence. Importance of study of ground water, earth quakes and land slides.

IMPORTANCE OF GEOPHYSICAL STUDIES: Principles of geophysical study by Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radiometric methods and Geothermal method. Special importance of Electrical resistivity methods, and seismic refraction methods. Improvement of competence of sites by grouting etc. Fundamental aspects of Rock mechanics and Environmental Geology.

UNIT - V

GEOLOGY OF DAMS, RESERVOIRS AND TUNNELS: Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factor's contributing to the success of a reservoir. Geological factors influencing water Lightness and life of reservoirs - Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations (i.e. Lithological, structural and ground water) in tunneling over break and lining in tunnels.

TEXT BOOKS:

- 1) Engineering Geology by N.Chennakesavulu, Mc-Millan, India Ltd. (2009)
- 2) Engineering Geology for Civil Engineers – P.C. Varghese PHI. (2012)
- 3) Engineering Geology by Parbin Singh, S.K.Kataria & Sons. (2012)
- 4) Principles of Engineering Geology by K.V.G.K. Gokhale – B.S publications. (2008)

REFERENCES:

1. F.G. Bell, Fundamental of Engineering Geology Butterworths, Publications, New Delhi, 2007.
2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution. 1957.
- 3) Engineering Geology by Subinoy Gangopadhyay, Oxford university press.2013.

II Year B. Tech. II Sem

L	T	P	C
4	1	0	4

(CE0445) ENVIRONMENTAL ENGINEERING

Pre Requisites: Fluid Mechanic

Objectives:

This subject provides the knowledge of water sources, water treatment, design of distribution system, waste water treatment, and safe disposal methods. The topics of characteristics of waste water, sludge digestion are also included.

Outcomes:

Student will able to provide fundamentals for water treatment and waste water treatment, design of distribution systems.

Syllabus:

UNIT – I

Introduction: Waterborne diseases – protected water supply – Population forecasts, design period – types of water demand – factors affecting – fluctuations – fire demand – water quality and testing – drinking water standards: sources of water - Comparison from quality and quantity and other considerations – intakes – infiltration galleries.

UNIT II

Layout and general outline of water treatment units – sedimentation – principles – design factors – coagulation-flocculation clarifier design – coagulants - feeding arrangements. Filtration – theory – working of slow and rapid gravity filters – multimedia filters – design of filters – troubles in operation - comparison of filters – disinfection – theory of chlorination, chlorine demand - other disinfection practices- Miscellaneous treatment methods.

UNIT-III

Distribution systems requirement –method and layouts -Design procedures- Hardy Cross and equivalent pipe methods pipe – joints, valves such as sluice valves, air valves, scour valves and check valves water meters – laying and testing of pipe lines – pump house - Conservancy and water carriage systems – sewage and storm water estimation – time of concentration – storm water overflows combined flow

UNIT - IV

characteristics of sewage – cycles of decay – decomposition of sewage, examination of sewage – B.O.D. Equation – C.O.D. Design of sewers – shapes and materials – sewer appurtenances manholes – inverted siphon – catch basins – flushing tanks – ejectors, pumps and pump houses – house drainage – components requirements – sanitary fittings-traps – one pipe and two pipe systems of plumbing.

UNIT – V

Waste water treatment plant – Flow diagram - primary treatment Design of screens – grit chambers – skimming tanks – sedimentation tanks – principles of design – Biological treatment – trickling filters – standard and high rate –UASB Technique Construction and design of oxidation ponds. Sludge digestion – factors effecting – design of Digestion tank – Sludge disposal by drying – septic tanks working principles and design – soak pits. ultimate disposal of sewage – sewage farming – dilution.

Text Books:

1. Water supply and sanitary Engineering by G.S. Birdi, Dhanpat Rai & Sons Publishers (2014).
2. Water Supply & Environmental Engineering by A.K. Chatterjee 6th Edition.
3. Water and Waste Water Technology by Mark J Hammar and Mark J. Hammar Jr 7th Edition. (2013)

References:

1. Water and Waste Water Engineering by Fair Geyer and Okun 3rd edition (2010).
2. Text book of Environmental Engineering by P. Venugopal Rao (PHI) (2002).
3. Waste water Engineering by Metcalf and Eddy (1991).
4. Unit operations in Environmental Engineering by R. Elangovan and M.K. Sasutharam (New age) 10th Edition (2007).
5. Water Water Engineering, Dr. B.C. Punmia, Ashok K. Jain, Dr. Arun K. Jain (2016)

II Year B. Tech. II Sem

L T P C
0 2 0 0

(GN0491) GENDER SENSITIZATION

(An Activity-based Course)

Objectives:

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

Syllabus:

UNIT-I

UNDERSTANDING GENDER

Gender: Why Should We Study It? (*Towards a World of Equals: Unit -1*)

Socialization: Making Women, Making Men (*Towards a World of Equals: Unit -2*)

Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.

UNIT– II

GENDER AND BIOLOGY

Missing Women: Sex Selection and Its Consequences (*Towards a World of Equals: Unit - 4*)

Declining Sex Ratio. Demographic Consequences.

Gender Spectrum: Beyond the Binary (*Towards a World of Equals: Unit -10*)

Two or Many? Struggles with Discrimination.

UNIT – III

GENDER AND LABOUR

Housework: the Invisible Labour (*Towards a World of Equals: Unit -3*)

“My Mother doesn’t Work.” “Share the Load.”

Women’s Work: Its Politics and Economics (*Towards a World of Equals: Unit -7*)

Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages and Conditions of Work.

UNIT – IV

ISSUES OF VIOLENCE

Sexual Harassment: Say No! (*Towards a World of Equals: Unit -6*)

Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: “*Chupulu*”.

Domestic Violence: Speaking Out (*Towards a World of Equals: Unit -8*)

Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Additional Reading: New Forums for Justice.

Thinking about Sexual Violence (*Towards a World of Equals: Unit -11*)

Blaming the Victim-“I Fought for my Life....” - Additional Reading: The Caste Face of Violence.

UNIT – V

GENDER: CO-EXISTENCE

Just Relationships: Being Together as Equals (*Towards a World of Equals: Unit - 12*)

Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Additional Reading: Rosa Parks-The Brave Heart.

Text Books:

Essential Reading: All the Units in the Textbook, “*Towards a World of Equals: A Bilingual Textbook on Gender*” written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.

Reference Books:

1. Sen, Amartya. “More than One Million Women are Missing.” *New York Review of Books* 37.20 (20 December 1990). Print. ‘*We Were Making History...’ Life Stories of Women in the Telangana People’s Struggle*. New Delhi: Kali for Women, 1989.

2. Tripti Lahiri. "By the Numbers: Where Indian Women Work." *Women's Studies Journal* (14 November 2012) Available online at: <http://blogs.wsj.com/India/real-time/2012/11/14/by-the-numbers-where-indian-women-work/>>
3. K. Satyanarayana and Susie Tharu (Ed.) *Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2: Telugu And Kannada* http://harpercollins.co.in/BookDetail.asp?Book_Code=3732
4. Vimala. "Vantillu (The Kitchen)". *Women Writing in India: 600 BC to the Present. Volume II: The 20th Century*. Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 599-601.
5. Shatrughna, Veena et al. *Women's Work and its Impact on Child Health and Nutrition*, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research. 1993.
6. Stree Shakti Sanghatana. "We Were Making History' *Life Stories of Women in the Telangana People's Struggle*. New Delhi: Kali for Women, 1989.
7. Menon, Nivedita. *Seeing like a Feminist*. New Delhi: Zubaan-Penguin Books, 2012
8. Jayaprabha, A. "Chupulu (Stares)". *Women Writing in India: 600BC to the Present. Volume II: The 20th Century* Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 596-597.
9. Javeed, Shayan and Anupam Manuhaar. "Women and Wage Discrimination in India: A Critical Analysis." *International Journal of Humanities and Social Science Invention* 2.4(2013)
10. Gautam, Liela and Gita Ramaswamy. "A 'conversation' between a Daughter and a Mother." *Broadsheet on Contemporary Politics. Special Issue on Sexuality and Harassment: Gender Politics on Campus Today*. Ed. Madhumeeta Sinha and Asma Rasheed. Hyderabad: Anveshi Research Center for Women's Studies, 2014.
11. Abdulali Sohaila. "I Fought For My Life...and Won." Available online at: <http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulali/>
12. Jeganathan Pradeep, Partha Chatterjee (Ed). "Community, Gender and Violence *Subaltern Studies XI*". Permanent Black and Ravi Dayal Publishers, New Delhi, 2000
13. K. Kapadia. *The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India*. London: Zed Books, 2002
14. S. Benhabib. *Situating the Self: Gender, Community, and Postmodernism in Contemporary Ethics*, London: Routledge, 1992
15. Virginia Woolf. *A Room of One's Own*. Oxford: Black Swan. 1992.
16. T. Banuri and M. Mahmood, *Just Development: Beyond Adjustment with a Human Face*, Karachi: Oxford University Press, 1997

II Year B. Tech. II Sem

L T P C
0 0 3 1

(CE0422) ENGINEERING GEOLOGY LAB

Pre Requisites: Engineering Geology Theory

Objectives:

The objective of this lab is to provide practical knowledge about physical properties of minerals, rocks, drawing of geological maps, showing faults, uniformities etc.

Outcomes:

Identify the various rocks, minerals depending on geological classifications

- Study of physical properties and identification of minerals referred under theory.
- Megascopic description and identification of rocks referred under theory.
- Microscopic study of rocks.
- Interpretation and drawing of sections for geological maps showing tilted beds, faults, uniformities etc.
- Simple Structural Geology problems.
- Electrical resistivity meter.

Syllabus:

1. Description and identification of SIX minerals
2. Description and identification of Six Rocks (including igneous, sedimentary and metamorphic rocks)
3. Interpretation of a Geological map along with a geological section.
4. Simple strike and Dip problems.
5. Microscopic identification of rocks.

II Year B. Tech. II Sem

L T P C
0 0 3 2

(CE0446) ENVIRONMENTAL ENGINEERING LAB

Pre Requisites: Chemistry Laboratory

Objectives:

The laboratory provides knowledge of estimating various parameters like PH, Chlorides, Sulphates, and Nitrates in water. For effective water treatment, the determination of optimum dosage of coagulant and chloride demand is also included. The estimation status of industrial effluents will also be taught in the laboratory by estimating BOD and COD of effluent.

Outcomes:

Students can provide various properties of water

Syllabus:

LIST OF EXPERIMENTS

1. Determination of pH and Turbidity
2. Determination of Conductivity and Total dissolved solids (Organic and Inorganic)
3. Determination of Alkalinity/Acidity.
4. Determination of Chlorides.
5. Determination of iron.
6. Determination of Dissolved Oxygen.
7. Determination of Nitrates.
8. Determination of Optimum dose of coagulant
9. Determination of Chlorine demand
10. Determination of total Phosphorous.
11. Determination of B.O.D
12. Determination of C.O.D
13. Presumptive coliform test.

NOTE: At least 8 of the above experiments are to be conducted.

II Year B. Tech. II Sem

L T P C
0 0 3 2

(CE0443) FLUID MECHANICS & HYDRAULIC MACHINERY LAB

Pre Requisites: FM & HHM Theory

Objectives:

To give the student an exposure to various hydraulic devices and hydraulic machines.

Outcomes: Fluid Mechanics & Hydraulics Machinery

Syllabus:

1. Calibration of Venturimeter & Orifice meter
2. Determination of Coefficient of discharge for a small orifice / mouthpiece by constant head method.
3. Calibration of contracted Rectangular Notch and / Triangular Notch
4. Determination of friction factor of a pipe.
5. Determination of Coefficient for minor losses.
6. Verification of Bernoulli's equation.
7. Impact of jet on vanes
8. Study of Hydraulic jump.
9. Performance test on Pelton wheel turbine
10. Performance test on Francis turbine.
11. Performance characteristics of a single stage/ multi-stage centrifugal pump.
12. Performance characteristics of a reciprocating pump.
