

SRI VASAVI ENGINEERING COLLEGE(AUTONOMOUS)

(Sponsored by Sri Vasavi Educational Society)

Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
Pedatadepalli, **TADEPALLIGUDEM – 534 101**, W.G. Dist, (A.P.)

Department of Civil Engineering



Dtd: 20.04.2019

Minutes of the BOS Meeting

Second BOS Meeting of Civil Engineering Department was held on 20.04.2019 at 10:30 AM in the presence of the following members.

SL.No.	Name	Position
1	Mr.M.Sambasiva Rao	Chairman
2	Dr. GVR Prasada Raju	Member
3	Dr. C. B. Kameswar Rao	Member
4	Dr. M. Kumar	Member
5	Er. DSR Sekhar	Member
6	Mr.G.Radhakrishnan	Faculty of CE
7	Mr.T.Yeswanth Sai	Faculty of CE
8	Mr.VLD Prasad Reddy	Faculty of CE
9	Ms.K.Chandrika	Faculty of CE

Minutes of the meeting, BOS of Civil Engineering

1. Introducing members of Board of Studies

The Chairman, BOS has extended a formal welcome and introduced the members.

2. Review of the minutes of the previous meeting.

Reviewed the minutes of the previous meeting and suggested the following

Modifications in III Semester Course Structure

1. V18CET02, Building Planning and Construction Management is removed from III Semester.
2. V18MAT04 Probability and Statistics is taken in place of V18CET03 Transform & Discrete Mathematics.
3. V18CET04 is renamed as Strength of Materials-I instead of Introduction to Solid Mechanics.

4. V18CET36 Building Materials Planning and Construction is included in place of V18CET05 Effective Technical Communication.
5. V18CET10 Introduction to Fluid Mechanics is placed in III Semester instead of IV Semester and credits also enhanced from 3 to 4.
6. V18MBT51 Managerial Economics & Financial Analysis is included in IV Sem instead of III Sem.

Modifications in IV Semester

1. V18CET13 Strength of Materials-II is taken in place of V18CET07 Energy Science & Engineering.
2. V18CET14 Hydraulic Engineering is included in place of V18CET10 Introduction to Fluid Mechanics.
3. V18MBT51 Managerial Economics & Financial Analysis is included in place of V18MBT12 Organizational Behavior.
4. V18CET14 Hydraulic Engineering is included in IV sem instead of V sem.

Modifications in VI Semester

1. V18CET37 Building Estimation and construction management is included in place of V18CET20 –Engineering Economics, Estimation and costing.
2. The Revised course structure for the academic year 2019-20 is enclosed in **Appendix-CE-01**
3. **Review of the syllabi approved for the Academic Year 2018-19.**
Reviewed the syllabi of the Academic Year 2018-19 It is suggested that in Mathematics Transform & Discrete Mathematics may also be included. However it will be taken up in the next Academic year.
4. **Suggest modifications for the existing course structure**
All ready mentioned in item 2
5. **Approval of syllabi for proposed courses for the academic year 2019-2020.**
6. Approved the syllabi for proposed courses for the academic year 2019-20 and enclosed in **Appendix-CE-02**

COURSE STRUCTURE OF SECOND YEAR B.TECH (CIVIL)**(For 2018 – 2019 Admitted Batch)****III SEMESTER**

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET04	Strength of Materials-I	3	1	0	4
2	V18CET36	Building Materials Planning & Construction	3	1	0	4
3	V18CET10	Introduction to Fluid Mechanics	3	1	0	4
4	V18CET35	Principles of Environmental Science & Engineering	2	0	0	2
5	V18MAT04	Probability & Statistics	3	1	0	4
6	VI8EET01	Basic Electrical and Electronics Engineering	3	1	0	4
7	V18CEL02	Material Testing Lab	0	0	3	1.5
8	VI8EEL01	Basic Electrical and Electronics Engineering Lab	0	0	2	1
9	V18ENT03	Professional Communication Skills -I	3	0	0	MNC
Total			20	3	6	24.5

IV SEMESTER

S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	V18CET13	Strength of Materials-II	3	0	0	3
2	V18CET08	Engineering Geology	2	0	0	2
3	V18CET09	Concrete Technology	3	1	0	4
4	V18CET14	Hydraulic Engineering	3	1	0	4
5	V18CET11	Surveying and Geometrics	2	1	0	3
6	V18MBT51	Managerial Economics & Financial Analysis	3	0	0	3
7	V18CEL03	Concrete Technology Lab	0	0	3	1.5
8	V18CEL04	Surveying Lab	0	0	3	1.5
9	V18CEL05	Fluid Mechanics And Hydraulic Machinery Lab	0	0	3	1.5
10	V18CEL06	Engineering Geology Lab	0	0	2	1
11	V18ENT04	Professional Communication Skills -II	3	0	0	MNC
Total			17	4	11	24.5

III SEMESTER- SYLLABUS

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET04
Name of the Course	STRENGTH OF MATERIALS-I					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Understand the basic materials behavior under the influence of different external loading conditions and the support conditions
- Draw the diagrams indicating the variation of the key performance features like bending moment and shear forces
- Understand bending concepts and calculation of section modulus and for determination of stresses developed in the beams and torsion.
- Assess stresses across section of the thin and thick cylinders to arrive at optimum sections to withstand the internal pressure using Lamé's equation.

SYLLABUS:**UNIT – I:**

Simple Stresses ,Strains and Strain Energy: Elasticity and plasticity –Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Workingstress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elasticmoduli and the relationship between them – Bars of varying section – composite bars –Temperature stresses.

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 loads, 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 bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections – Design of simple beam sections.

UNIT –IV:

Shear Stresses: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections, built up beams, shear centre.

UNIT – V:

Torsion- Derivation of torsion equation and its assumptions. Applications of the equation of the hollow and solid circular shafts, torsional rigidity, combined torsion and bending of circular shafts, principal stress and maximum shear stresses under combined loading of bending and torsion. Analysis of closed-coiled –helical springs

UNIT – VI:

Thin and Thick Cylinders: Thin cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in diameter, 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.

TEXT BOOKS:

1. Mechanics of Materials- R. C. Hibbler, Pearson; 10 edition (January 15, 2016)
2. Strength of materials -S. S. Bhavakatti, Vikas Publishing House; Fourth edition (2013)
3. Strength of Materials -R. K. Rajput, S. Chand Publishing (6th Edition) (2015)
4. Strength of Materials -R.K Bansal,Laxmi Publications; Sixth edition (2018)

REFERENCES:

1. Fundamentals of Solid Mechanics M.L. Gambhir, PHI Learning Pvt. Ltd., New Delhi. (1 December 2009)
2. Introduction to Strength of Material by U.C. Jindal,Pearson Education; Second edition (28 September 2017)
3. Strength of materials by R. Subramanian, Oxford university press, New Delhi, third edition (15 June 2016)

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET36
Name of the Course	BUILDING MATERIALS, PLANNING AND CONSTRUCTION					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Identify different building materials and their importance in building construction.
- Differentiate brick masonry, stone masonry construction
- Use of lime and cement in various constructions.
- Describe the importance of building components and finishing's.
- Understand building by-laws, ventilation and lightening requirements

UNIT – I:

Stones, Bricks and Tiles: Building stones – classifications and quarrying – properties – structural requirements and dressing. Bricks – Composition of Brick earth – manufacture and structural requirements, Fly ash, Ceramics, Timber, Aluminum, Glass, Paints and Plastics: Wood - structure – types and properties – seasoning – defects; alternate materials for Timber–GI/ fibre – reinforced glass bricks, steel & aluminum, Plastics.

UNIT – II:

Cement & Admixtures: Ingredients of cement – manufacture – Chemical composition – Hydration - field & lab tests. Admixtures – mineral & chemical admixtures – uses.

Lime: Various ingredients of lime – Constituents of lime stone – classification of lime – various methods of manufacture of lime

UNIT – III:

Mortars: Lime and Cement Mortars.

Masonry: Brick masonry – types – bonds; Stone masonry – types; Composite masonry – Brick- stone composite; Concrete, Reinforced brick. Cavity and partition walls.

Finishing's: Plastering, Pointing, Painting, Claddings – Types – Tiles – ACP.

UNIT-IV:

Aggregates: Classification of aggregate – Coarse and fine aggregates- particle shape and texture – Bond and Strength of aggregate – Specific gravity – Bulk Density, porosity and absorption – Moisture content of Aggregate- Bulking of sand – Sieve analysis.

Miscellaneous materials: Bitumen and asphaltic materials, structural steel and other metals, geo textiles, carbon composites including properties and uses.

UNIT V:

Building Byelaws and Regulations: Introduction- terminology- objectives of building byelaws- floor area ratio- floor space index- principles under laying building bye laws- classification of buildings- open space requirements – built up area limitations- height of buildings– lightening and ventilation requirements.

Residential buildings: Minimum standards for various parts of buildings requirements of different rooms and their grouping- characteristics of various types of residential buildings, relationship between plan, elevation, Climate influence on Orientation of Buildings.

UNIT – VI:

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.

Form work: Types: Requirements – Standards – Scaffolding – Design; Shoring, Underpinning.

TEXT BOOKS:

1. Building Materials and Construction – Arora & Bindra, Dhanpat Roy Publications. 2010,5th edition.
2. Building Materials, M. L. Gambhir, Tata McGraw Hill Publishing Co. Ltd. New Delhi. 2014, 5th edition,.
3. Building Construction by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi. 2016,11th edition.
4. Building Materials, S. S. Bhavikatti, Vikas publications House private ltd. 2012, 1st edition.
5. Building Construction, S. S. Bhavikatti, Vikas publications House private ltd. 2012, 1st edition.
6. Building planning and drawing,Dr.N.Kumara swamy,A.kameswara Rao, 2012, 6th edition.

REFERENCES:

1. Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd 2017, 1st edition.
2. Building Materials by Duggal, New Age International. 2012 ,4th edition.
3. Building Materials by P. C. Varghese, PHI. 2015, 2nd edition.
4. Building Construction by PC Varghese PHI. 2007, 1st edition.
5. Construction Technology – Vol – I & II by R. Chubby, Longman UK.1987, 2nd edition.
6. Alternate Building Materials and Technology, Jagadish, Venkatarama Reddy and others; New Age Publications.2017 ,2nd edition.

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET10
Name of the Course	INTRODUCTION TO FLUID MECHANICS					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Understand the physical properties of fluids and their influences on fluid motion
- Calculate the forces acting on plane and curved surfaces and solve fluid flow problems in kinematics.
- Solve a variety of problems in fluid dynamics
- Solve various pipe flow problems
- Solve various laminar flow problems
- Assess fluid flow through pipes using different devices

UNIT I:

INTRODUCTION : Dimensions and units – Physical properties of fluid specific gravity, viscosity, surface tension, vapor 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 Micro Manometers.

UNIT – II:

HYDROSTATICS: Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Center of pressure, derivations and problems.

UNIT – III:

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

UNIT – IV:

FLUID DYNAMICS: Surface and body forces – Euler’s and Bernoulli’s equations for flow along a stream line for 3-D flow, Momentum principle, Momentum equation and its application – forces on pipe bend.

UNIT – V:

CLOSED CONDUIT FLOW: Laws of Fluid friction – Darcy’s equation, Minor losses – pipes in series – pipes in parallel, Total energy line and hydraulic gradient line, Pipe network problems, Variation of friction factor with Reynold’s number, Moody’s Chart.

UNIT – VI:

MEASUREMENT OF FLOW: Pitot tube, Venturi meter and Orifice meter, classification of orifices, small orifice and large orifice, flow over rectangular, triangular and trapezoidal and Stepped notches, Broad crested weirs.

TEXT BOOKS:

1. Hydraulics and Fluid Mechanics including Hydraulic Machines by Dr. P.N. Modi and Dr. S.N. Seth, Standard Book house, Rajsons Pvt. Ltd., 21st Edition, 2017

2. A textbook of Fluid Mechanics and Hydraulic Machines by Dr. R.K. Bansal, Laxmi Publications (P) Ltd., New Delhi, 10th Edition, 2018

REFERENCES:

1. Introduction to Fluid Mechanics and Fluid Machines by S.K. Som, G. Biswas, Suman Chakraborty, Mc Graw Hill Education, 3rd Edition, 2017.
2. Fluid Mechanics by A.K. Mohanty, Prentice Hall of India Pvt. Ltd., New Delhi, 2nd Edition, 1994.
3. Fluid Mechanics and Hydraulic Machines by K. Subramanya, Mc Graw Hill Education, 1st Edition, 2010.

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	2	0	0	2	V18CET35
Name of the Course	PRINCIPLES OF ENVIRONMENTAL SCIENCE & ENGINEERING					
Branch	CIVIL ENGINEERING					

Course Outcomes:

Upon successful completion of the course, the student will be able to

- Outline the global environmental challenges and environmental legislations.
- Interpret various natural resources and associated problems.
- Discuss various attributes of environmental pollution.
- Interpret quality of water.
- Operate sewage water treatment plants.
- Illustrate various solid waste management practices.

UNIT I: FUNDAMENTALS OF ENVIRONMENTAL STUDIES AND ACTS

Definition and components of environment, Global Environmental Challenges: Global warming and climate change, Acid rains, Ozone layer depletion - Population explosion and effects.

Environmental Protection Act, 1986 - Air (Prevention and Control of Pollution) Act, 1981 - Water (Prevention and Control of Pollution) Act, 1974 -Wildlife (Protection) Act, 1972 - Forest (Conservation) Act.

UNIT II: NATURAL RESOURCES AND ASSOCIATED PROBLEMS

Forest resources: Use and over exploitation - Deforestation: Timber extraction, Mining, dams and other effects on forest and tribal people. Water resources: Use and over utilization of surface and ground water - Floods, drought, conflicts over water - Dams: Benefits and problems. Effects of extracting and using mineral resources. Energy resources: Renewable and Non-renewable energy sources. Land resources: Land degradation, Wasteland reclamation.

UNIT III: ENVIRONMENTAL POLLUTION

Definition, Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution and Nuclear Pollution.

UNIT IV: WATER QUALITY AND DESIGN OF WATER TREATMENT UNITS

Impurities in water -Water borne diseases - Protected water supply - Water quality and testing - Drinking water standards- 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- Desalination processes.

UNIT V: SEWAGE QUALITY AND DESIGN OF SEWAGE TREATMENT UNITS

Conservancy and water carriage systems– Characteristics of sewage– BOD – COD equations. Dilution –Self purification of rivers - Layout and general outline of various units in a waste water treatment plant.

Primary treatment - Design of screens – Grit chambers – Skimming tanks – Sedimentation tanks – Principles of design – Biological treatment – Trickling filters – Standard and high rate.

UNIT –VI: SOLID WASTE MANAGEMENT

Municipal Solid Wastes: Characteristics-Generation- collection- Methods of collection-Equipment types of vehicles-Man power requirement-Collection routes. Need for Transfer operations-Transfer Stations-Selection of location of transfer station-Transport means and methods - Engineered systems for solid waste management - Recycle energy recovery treatment and disposal.

TEXT BOOKS:

1. Principles of environmental science and engineering by P. Venugopala Rao by Prentice Hall India Learning Private Limited, 1st Edition edition (2006), new Delhi.
2. Principles of environmental sciences by Jan J. Boersea and Lucas reijnders , Springer; 2010 edition (May 27, 2010).
3. Environment Studies by Anubha Kaushik, C P Kaushik, New Age International Private Limited; Five edition (1 August 2018).
4. A Textbook of Environmental Studies, Shaashi Chawla, Tata McGraw Hill Education Private Limited (26 April 2012), New Delhi.
5. Fundamentals of Environment Studies, DD Mishra S Chand & Company (1 December 2010).
6. Water supply engineering by S.K.Garg Khanna publishers(2017),33 rd edition.
7. Sewage disposal and air pollution by S.K.Garg, Khanna publishers(2017),39th edition
8. Water supply engineering by B.C .punmia,Ashok Kumar jain and Arun K jain, Laxmi Publications (December 1, 2005) ,2nd edition.
9. Management of municipal solid waste by T.N.Ramachandra, The Energy and Resources Institute, TERI (1 December 2009).
10. Solid waste management by K. Sasi kumar,S.G. Krishna, Prentice Hall India Learning Private Limited (2009)

Year/Sem	III & IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	-	4	V18MAT04
Name of the Course	PROBABILITY AND STATISTICS					
Branches	CIVIL, EEE, ME & CSE					

Pre requisites: Probability, Conditional Probability, Baye's theorem on probability

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

CO1: Find measures of central tendency and dispersion for real data sets.

CO2: Find parameters of given function

CO3: Apply probability distribution to real time problems

CO4: Plot a best fit curve to an experimental data and find the correlation and regression

CO5: Create good estimators to various parameters

CO6: Apply the principles of Statistical Inference to practical problems

Unit-I: Basic Statistics

Measures of Central Tendency: Mean, Median, Mode

Measures of Dispersion: Variance, Standard deviation, Skewness and Kurtosis

Unit-II: Basic Probability

Random Variables: Discrete and continuous - Probability function – density and distribution function, Expectation of a Random Variable, Moments, Chebychev's Inequality (Without proof).

Unit-III: Probability Distributions

Probability distributions: Binomial, Poisson and Normal - Evaluation of statistical parameters: Mean, Variance and their properties, Introduction to Exponential, Gamma and Weibull distributions.

Unit-IV: Bivariate Distributions

Curve fitting by the method of Least squares- Fitting of straight line, parabola and exponential curves, Simple Correlation and Regression – Rank correlation.

Unit-V: Sampling Distribution and Estimation

Introduction –Sampling distribution of means with known and unknown standard deviation

Estimation: Criteria of a good estimator, point and interval estimators for means and proportions

Unit-VI: Tests of Hypothesis

Introduction-Type-I, Type-II Errors, Maximum Error, one-tail, two-tail tests, Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means.

Test of significance: Small sample test for single mean, difference of means and test of ratio of variances (F-Test) - Chi-square test for goodness of fit and independence of attributes.

Text Books:

1. V. Ramana, A text Book of Engineering Mathematics, Tata Mc Graw Hill.
2. Miller & Freund's, Probability & Statistics for Engineers – Eighth Edition, Richard. A. Johnson

References Books:

1. S. Ross, –A First Course in Probability||, Pearson Education India, 2002.
2. Dr.T.S.R.Murthy, Probability and Statistics for Engineers, BS Publications.
3. T. Veerarajan, –Engineering Mathematics||, Tata McGraw-Hill, New Delhi, 2010.

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18EET01
Name of the Course	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING					
Branches	CIVIL, CSE&ME					

Module 1 : DC Circuits

Electrical circuit elements (R, L and C), Kirchoff's current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Maximum Power Transfer, Thevenin and Norton Theorems.

Module 2: AC Circuits

Representation of sinusoidal waveforms, peak and RMS values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance.

Module 3: DC Machines

Introduction-Working principle of DC generator-Magnetization characteristics of D.C. Shunt generator -Types of DC motors- applications - three point starter. Transformers-Classification, working principle of ideal and practical transformer, losses in transformers, regulation and efficiency, OC& SC test on single phase transformer.

Module 4: AC Machines

Construction and working of a three-phase induction motor, torque-slip characteristics. Loss components and efficiency, starting and speed control of induction motor. Construction and Principle of operation of synchronous generators.

Module 5: Semiconductor Devices and Rectifiers

Introduction- Classification - PN junction diode characteristics a) Forward bias b) Reverse bias - Diode acts as a switch - Half-wave and Full-wave rectifiers - Concepts of ripple factor, voltage regulation and efficiency - Simple problems.

Module 6: Transistors

Types of Transistors - Transistor acts as an amplifier - CB, CE and CC configurations and characteristics- feedback amplifier.

Text Books

1. T. K. Nagsarkar, M. S. Sukhija, –Basic Electrical Engineering||, Oxford University Press, 2005
2. D. P. Kothari and I. J. Nagrath, –Basic Electrical Engineering||, Tata McGraw Hill, 2010.
3. D. C. Kulshreshtha, –Basic Electrical Engineering||, McGraw Hill, 2009.
4. E. Hughes, –Electrical and Electronics Technology||, Pearson, 2010.

Reference Books

1. L. S. Bobrow, –Fundamentals of Electrical Engineering||, Oxford University Press, 2011.
2. E. Hughes, –Electrical and Electronics Technology||, Pearson, 2010.

3. V. D. Toro, —Electrical Engineering Fundamentals||, Prentice Hall India, 1989.
4. S. K. Bhattacharya, —Basic Electrical and Electronics Engineering||, Pearson Education India, 2011
5. S. K. Sahdev, —Fundamentals of Electrical Engineering & Electronics||, DhanpatRai& Company, 2001

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	3	1.5	V18CEL02
Name of the Course	MATERIAL TESTING LAB					
Branch	CIVIL					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Identify the engineering properties of materials in the laboratory
- Assess torsion test to determine elastic constants
- Assess spring test to determine elastic constants
- Assess flexural test to determine elastic constants
- Determine hardness of metals
- Determine Impact strength of metals

List of Experiments

1. Tension test on Steel bar
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. 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. Setup for spring tests
7. Compression testing machine
8. Izod Impact machine
9. Shear testing machine
10. Beam setup for Maxwell's theorem verification.
11. Continuous beam setup

Year/Sem	III Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	2	1	V18EEL01
Name of the Course	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB					
Branches	CIVIL, CSE & ME					

Any 10 of the following experiments are to be conducted

1. Verification of Superposition Theorem.
2. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test.
3. Verification of maximum power transfer theorem.
4. Series and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination for RLC network.
5. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance and speed.
6. Speed control of D.C. Shunt motor by Armature & flux control methods
7. Brake test on DC shunt motor. Determination of performance characteristics.
8. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
9. Brake test on 3-phase Induction motor (performance characteristics).
10. PN junction diode characteristics a) Forward bias b) Reverse bias (Cut in voltage and resistance calculations)
11. Transistor CE characteristics (Input and output)
12. Half wave rectifier with and without filters.
13. Full wave rectifier with and without filters.
14. CE amplifiers.

IV SEMESTER- SYLLABUS

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	0	0	3	V18CET13
Name of the Course	STRENGTH OF MATERIALS – II					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Understand the basic concepts of Principal stresses developed in a member when it is subjected to stresses along different axes and design the sections.
- Assess stresses in different engineering applications like shafts, springs, columns and struts subjected to different loading conditions
- Assess forces in different types of trusses used in Construction.

UNIT I

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 failures: Various Theories of failures such as Maximum Principal stress theory – Maximum Principal strain theory – Maximum shear stress theory – Maximum strain energy theory – Maximum shear strain energy theory.

UNIT II

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.

UNIT III

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.

UNIT – IV

Direct and Bending stresses: Stresses under the combined action of direct loading and B.M. 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 B.M. about both axis.

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.

UNIT – VI

Analysis of pin-jointed plane frames: Determination of Forces in members of plane pin-jointed perfect trusses by (i) tension co efficient method (ii) method of sections. Analysis of various types of cantilever and simply supported trusses by tension co efficient method, method of sections.

TEXT BOOKS:

1. Mechanics of Materials- R. C. Hibbler, Pearson; 10 edition (January 15, 2016)
2. Strength of materials -S. S. Bhavakatti, Vikas Publishing House; Fourth edition (2013)
3. Strength of Materials -R. K. Rajput, S. Chand Publishing (6th Edition) (2015)
4. Strength of Materials - R.K Bansal, Laxmi Publications; Sixth edition (2018)

REFERENCES:

1. Fundamentals of Solid Mechanics M.L. Gambhir, PHI Learning Pvt. Ltd., New Delhi. (1 December 2009)
2. Introduction to Strength of Material by U.C. Jindal, Pearson Education; Second edition (28 September 2017)
3. Strength of materials by R. Subramanian, Oxford university press, New Delhi, third edition (15 June 2016)

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	2	0	0	2	V18CET08
Name of the Course	ENGINEERING GEOLOGY					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Relate the features of geological agents.
- Review the types of minerals and rocks
- Interpret hazard zonation with reference to secondary structures
- Review the landslides and their resulting subsidence.
- Assess the ground conditions using geophysical explorations
- Examine the engineering geological conditions of the strata and its suitability to major projects like Dams, Tunnels and Reservoirs etc.

UNIT-I

Introduction: Branches of geology, Importance of geology in Civil engineering with case studies.

Physical Geology: Geological processes, Weathering, Erosion and Civil engineering importance of weathering and Erosion

UNIT- II

Mineralogy: Definition of mineral, Importance of study of minerals, Significance of different physical properties in mineral identification, Study of physical properties, Structure and chemical composition of common rock forming and economic minerals viz. Feldspar, Quartz, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Apatite , Kyanite, Garnet, Beryl, Talc, Calcite, Dolomite, Pyrite, Hematite, Magnetite, Galena, Graphite, Magnesite, Bauxite and Clay minerals

Petrology: Introduction, Civil Engineering importance of petrology, Definition of Rock, Rock cycle, Geological Classification of rocks
 Igneous Rocks: Forms, Structures and textures of igneous rocks, Megascopic description and civil engineering uses of Granite, Basalt, Dolerite, Pegmatite and Charnockite
 Sedimentary Rocks: Formation, Structures and textures of sedimentary rocks, Megascopic description and civil engineering uses of Laterite, Conglomerate, Sand stone, Lime stone and Shale

Metamorphic Rocks: Types of metamorphism, Structures and textures of metamorphic rocks, Megascopic Description and Civil engineering uses of Gneiss, Schist, Quartzite, Marble and Slate

UNIT-III

Structural Geology: Introduction, Out crop, Strike and dip, Causes for development of secondary structures, Classification of Structures associated with Folds, Faults, Joints, Unconformities and their Civil engineering importance

UNIT- IV

Earthquakes: Classification and causes, Intensity and magnitude and their measuring scales, Effects of earthquakes, Seismic belts, Civil Engineering considerations in seismic areas, Seismic zones of India

Land Slides: Classification, Causes and effects, Preventive measures of landslides
 Ground water: Introduction, Classification of rocks based on porosity and permeability, Types of aquifers, Effects of groundwater over draft

UNIT- V

Geophysics: Importance of Geophysical methods, Classification, Principles of Geophysical study by Gravity method, Magnetic method, Electrical methods, Seismic methods, Radiometric method and Electrical resistivity, Seismic refraction methods

UNIT- VI

Dams: Types of Dams, Geological considerations for the selection of dam sites, Stages of investigation, Case histories of few dam failures, Geology of few Indian dam sites

Tunnels: Purpose of Tunneling, Geological considerations for tunneling, Effects of tunneling, Over break, Geology of some tunnel sites

TEXTBOOKS:

1. A text Book of Engineering Geology by N. Chenna Kesavulu, Macmillan India Ltd., Delhi, second edition, 2009.
2. Principles of Engineering Geology by K M Bangar, Standard Publishers and Distributers, 2009.
3. Principles of Engineering Geology- K Gokhale, B. S. Publication, Revised Edition, 2010.

REFERENCE BOOKS:

1. Fundamentals of Engineering Geology, F.G.Bell, published by Butterworth-Heinemann, 1983.
2. Principles of Engineering Geology and Geotechnics by D P Krynine and W R Judd, CBS Publishers & Distribution, first edition, 2005.
3. Engineering Geology for Civil Engineers by D. Venkata Reddy, Oxford & IBM Publishing Company Pvt. Ltd., New Delhi, second edition, 2017.
4. Engineering and General Geology by Parbin Singh, Published by S. K. Kataria & Sons, New Delhi, 2013.
5. Engineering Geology and Rock Mechanics by Dr B.P.Varma, Khanna Publishers, Delhi, 1998.

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET09
Name of the Course	CONCRETE TECHNOLOGY					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Understand the basic concepts of concrete.
- Realize the importance of quality of concrete.
- Familiarize the basic ingredients of concrete and their role in the production of concrete and its behavior in the field.
- Test the fresh concrete properties and the hardened concrete properties.
- Evaluate the ingredients of concrete through lab test results and design the concrete mix by BIS method.
- Familiarize the basic concepts of special concrete and their production and applications and understand the behavior of concrete in various environments.

UNIT I:

Introduction of Concrete, Cements and Admixtures: Portland cement – Chemical composition – Hydration, Setting of cement, Fineness of cement, Structure of hydrated cement–Test for physical properties – Different grades of cements (opc-33,opc-43,opc-53) – Admixtures – Mineral and chemical admixtures – accelerators, retarders, air entrainers, plasticizers, super plasticizers, fly ash and silica fume.

Aggregates: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand –Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis –Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Gap graded and well graded aggregate as per relevant IS code – Maximum aggregate size - Quality of mixing water.

UNIT – II:

Fresh Concrete: Steps in Manufacture of Concrete–proportion, mixing, placing, compaction, finishing, curing – including various types in each stage. Properties of fresh concrete-Workability – Factors affecting workability – Measurement of workability by different tests, Setting times of concrete, Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete.

UNIT – III:

Hardened Concrete: Water / Cement ratio – Abram’s Law – Gel space ratio – Nature of strength of concrete –Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression &

tensile strength – Curing, Testing of Hardened Concrete: Compression tests – Tension tests – Flexure tests – Split tension tests – Non-destructive testing methods – codal provisions for NDT.

UNIT – IV:

Elasticity, Creep & Shrinkage, Modulus of elasticity, Dynamic modulus of elasticity, Poisson's ratio, Creep of concrete, Factors influencing creep, Relation between creep & time, Nature of creep, Effects of creep – Shrinkage – types of shrinkage, Factors affecting shrinkage.

UNIT – V:

Mix Design: Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Concepts proportioning of concrete mixes by BIS method of mix design.

UNIT – VI:

Special Concretes: Ready mixed concrete, Shotcrete, Light weight aggregate concrete, Cellular concrete, No-fines concrete, High density concrete, Fibre reinforced concrete, Different types of fibres, Factors affecting properties of Fibre reinforced concrete, Polymer concrete, Types of Polymer concrete, Properties of polymer concrete, High performance concrete – Self consolidating concrete, SIFCON, self healing concrete.

Text Books:

1. Concrete Technology, M. S. Shetty. – S. Chand & Company
2. Concrete Technology, A. R. Santha Kumar, Oxford University Press, New Delhi

References:

1. Properties of Concrete, A. M. Neville – PEARSON – 4th edition
2. Concrete Technology, M.L. Gambhir. – Tata Mc. Graw Hill Publishers, New Delhi

Codal Provisions:

1. IS 269:1989 – Ordinary Portland Cement, grade 33
2. IS 4031:1988 – methods of physical tests for hydraulic cement.
3. IS 383:1970 – Specification for coarse and fine aggregate from natural sources for concrete.
4. IS 456:2000 Code of practice for plain and reinforced concrete.
5. IS 10262:2009 – Guideline for concrete mix proportioning.
6. SP 16:1980 Design aids for reinforced concrete to IS 456:1978

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	3	1	0	4	V18CET14
Name of the Course	HYDRAULIC ENGINEERING					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Solve uniform open channel flow problems
- Solve Non-uniform open channel flow problems
- Apply the principles of dimensional analysis and similitude in hydraulic model Testing
- Estimate the impact of jet on plane and curved surfaces using momentum Principle.
- Develop performance characteristics of turbines using velocity triangles
- Calculate work done and efficiency of centrifugal and reciprocating pumps

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.

UNIT II:

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 – III:

HYDRAULIC SIMILITUDE: Dimensional analysis - Rayleigh's method and Buckingham's pi theorem, study of Hydraulic models – Geometric, kinematic and dynamic similarities, dimensionless numbers, model laws, scale effect.

UNIT – IV:

MOMENTUM PRINCIPLES: 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.

UNIT – V:

BASICS OF HYDRAULIC MACHINERY: Layout of hydropower installation, Heads and efficiencies, classification of turbines.

HYDRAULIC TURBINES: Pelton wheel, Francis turbine, Kaplan turbine - 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 – VI:

CENTRIFUGAL PUMPS: Pump installation details, classification, work done, manometric head, minimum starting speed, losses and efficiencies, specific

speed, multistage pumps, pumps in parallel, performance of pumps, characteristic curves, NPSH, Cavitation.

RECIPROCATING PUMPS: Introduction, classification of reciprocating pumps, main components of reciprocating pumps, working of a reciprocating pumps, discharge through pumps, indicator diagram, work done by reciprocating pumps, slip of reciprocating pumps.

TEXT BOOKS:

1. A textbook of Fluid Mechanics and Hydraulic Machines by Dr. R.K. Bansal, Laxmi Publications (P) Ltd., New Delhi, 10th Edition, 2018
2. Hydraulics and Fluid Mechanics including Hydraulic Machines by Dr. P.N. Modi and Dr. S.N. Seth, Standard Book house, Rajsons Pvt. Ltd., 21st Edition, 2017
3. A text book of Fluid mechanics and Hydraulic machines by Er. R. K. Rajput, S. Chand & company, 6th Edition, 2016

REFERENCES:

1. Flow in Open Channels by K. Subramanya, Mc Graw Hill Education, 4th Edition, 2015.
2. Fluid Mechanics and Hydraulic Machines by K. Subramanya, Mc Graw Hill Education, 1st Edition, 2010.

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	2	1	0	3	V18CET11
Name of the Course	SURVEYING AND GEOMATICS					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Demonstrate the basic surveying skills
- Use various surveying instruments.
- Perform different methods of surveying
- Compute various data required for various methods of surveying.
- Integrate the knowledge on surveying to the new frontiers of science like Global positioning System, Remote sensing

UNIT- I:

Introduction: Definition-Uses of surveying- overview of plane surveying (chain, Compass and plane table), Objectives, Principles and classifications – Errors in survey Measurements

UNIT – II:

Compass survey and traversing: Electronic distance measurements (EDM)-principles of electro optical EDM-Errors and corrections to linear measurements-Compass survey-Meridians, Azimuths and Bearings, declination, computation of angle. Traversing-Purpose-types of traverse-traverse computation-traverse adjustments-Introduction omitted measurements

UNIT-III:

Leveling, Contouring and Curves::Concept and Terminology, Leveling Instrument and their Temporary and permanent adjustments- method of leveling. Characteristics and Uses of contours- methods of conducting contour surveys.Types of curves, design and setting out – simple and compound curves

UNIT – IV:

Theodolite, Description, principles-uses and adjustments – temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite – Introduction to Trigonometrically leveling.

Tachometric Surveying: Stadia and tangential methods of Tacheometry. Distance and-Elevation formulae for Staff vertical position

UNIT-V:

Computation of Areas and Volumes: Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

UNIT-VI: Introduction to Geomatic, Total Station and Global positioning system, Electromagnetic spectrum, Visual image interpretation, Digital image processing.

Text Books:

1. Surveying, Vol No.1, 2 &3, B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain –
2. Laxmi Publications Ltd, New Delhi,seventeenth edition (2016)
3. 2 Text book of Surveying, S.K. Duggal (Vol No. 1&2), Tata McGraw Hill Publishing
4. Co. Ltd. New Delhi.Fourth edition (1 July 2017)
5. Text book of Surveying, Arora (Vol No. 1&2), STANDARD BOOK HOUSE SINCE 1960; Edition: Year-2015 edition (2015)
6. Anji Reddy, M., Remote sensing and geographical information system,BS Publications/BSP Books (2012)

Reference Books:

1. Text book of Surveying, C. Venkataramaiah, universities Press (India) Pvt. Ltd. (12 January 2011)
2. Surveying and levelling, R. Subramanian, Oxford University Press; 2 edition (30 June 2012)

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	3	1.5	V18CEL03
Name of the Course	CONCRETE TECHNOLOGY LAB					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Find some properties of cement by consistency, fineness, setting times, specific gravity, soundness and compressive strength.
- Determine the workability of cement concrete by compaction factor, slump and Vee – Bee tests.
- Determine properties of self-compacting concrete by Slump cone, V funnel, L Box
- Determine the specific gravity of coarse aggregate and fine aggregate by Sieve analysis.
- Determine the flakiness and elongation index of coarse aggregates.
- Determine the bulking of sand.
- Understand the non-destructive testing procedures on concrete

I. Tests on Cement

1. Normal Consistency and fineness of cement.
2. Initial setting time and final setting time of cement.
3. Specific gravity of cement
4. Soundness of cement.
5. Compressive strength of cement.

II. Tests on Aggregate

1. Sieve Analysis and gradation chairs
2. Bulking of sand.
3. Bulk and compact densities of fine and coarse aggregates

III. Tests on Fresh Concrete

1. Slump test
2. Compact factor test
3. Vee-bee Test
4. Flow Table Test

Tests on Self Compacting Concrete

1. Slump cone
2. V funnel
3. L Box

IV. Tests on hardened concrete

1. Compression test on cubes & Cylinders
2. Flexure test
3. Splitting Tensile Test
4. Modulus of Elasticity

V. Non Destructive tests of concrete

1. Rebound hammer
2. Ultrasound pulse Velocity (UPV)

Text Books:

1. Concrete Technology, M. S. Shetty. – S. Chand & Company

References:

1. Concrete Technology, M.L. Gambhir. – Tata Mc. Graw Hill Publishers, **New Delhi.**

Codes for reference:

1. IS: 4031 – chemical analysis and tests on cement.
2. IS 650:1991 –Standards and testing
3. IS 383:1970- Specification for coarse & fine aggregate
4. IS 2386 (Part III) 1963- Methods of test for aggregate for specific gravity, density, voids, absorption & bulking
5. IS 516:1959- Specification for compressive strength, Flexural strength
6. IS 5816:1999-Method of test for splitting tensile strength of concrete.
7. IS 13311(Part 1):1992 Methods of non-destructive testing of concrete: Part 1 Ultrasonic pulse velocity.
8. IS 13311(Part 2):1992 Methods of non-destructive testing of concrete: Part 2 Rebound hammer.
9. IS 6461(Part 7):1973 Glossary of terms relating to cement concrete: Part 7 Mixing, laying, compaction, curing and other construction aspects.

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	3	1.5	V18CEL04
Name of the Course	SURVEYING LAB					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Use different Survey instruments to collect field data
- Calculate distances, levels and angles from collected data
- Transfer points on ground to drawing sheet
- Interpret survey data to compute areas and volumes by using different methods
- Prepare profile of land from the collected survey data

List of experiments

1. Survey by chain survey of road profile with offsets in case of road widening.
2. Finding the area of the given boundary using compass (Closed Traverse)
3. Plane table survey; finding the area of a given boundary by the method of Radiation
4. Plane table survey; finding the area of a given boundary by the method of intersection.
5. Fly leveling : Height of the instrument method (differential leveling)
6. Fly leveling: Rise and Fall method.
7. Theodolite Survey: Determining the Horizontal and Vertical Angles by the method of repetition method.
8. Theodolite Survey: Finding the distance between two inaccessible points.
9. One Exercise on Curve setting.
10. One Exercise on contours.
11. Determination of area using total station
12. Determination distance between two inaccessible points.
13. Introduction to GPS.

Text/ References Books:

1. Surveying Vol No.1, 2 &3 by Dr.B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain –LaxmiPublications, seventeenth edition (2016), New Delhi.
2. Text book of Surveying by S.K. Duggal (Vol No. 1&2), McGraw Hill Education; Fourth edition (1 July 2017), New Delhi.
3. Text book of Surveying,Dr.K.R.Arora (Vol No. 1&2), STANDARD BOOK HOUSE SINCE 1960; Edition: Year-2015 edition (2015), Delhi.

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	3	1.5	V18CEL05
Name of the Course	FLUID MECHANICS AND HYDRAULIC MACHINERY LAB					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Show the verification of Bernoulli's equation
- Find the discharge through an orifice and mouth piece by using constant head and variable head methods.
- Calculate coefficient of discharge for Venturimeter and Orificemeter
- Find loss of head due to friction and minor losses in pipes
- Calculate the force exerted by the jet on the vanes.
- Calculate efficiency and sketch performance curves for turbines and pumps.

List of Experiments

1. Verification of Bernoulli's equation.
2. Calibration of Venturimeter and Orifice meter
3. Determination of Coefficient of discharge for a small orifice by a constant head method.
4. Determination of Coefficient of discharge for an external mouth piece by variable head method.
5. Characterization of laminar and turbulent flows by Reynold's apparatus.
6. Calibration of contracted Rectangular Notch and /or Triangular Notch
7. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
8. Impact of jet on vanes
9. Study of Hydraulic jump.
10. Performance studies on Pelton wheel turbine
11. Performance studies on Francis turbine/Kaplan turbine.
12. Performance studies on single stage centrifugal pump.
13. Performance studies on reciprocating pump.

List of Equipment:

1. Venturimeter setup.
2. Orifice meter setup.
3. Small orifice setup.
4. External mouthpiece setup.
5. Reynold's apparatus
6. Rectangular and Triangular notch setups.
7. Friction factor test setup.
8. Bernoulli's theorem setup.
9. Impact of jets.
10. Hydraulic jump test setup.
11. Pelton wheel and Francis turbines.
12. Centrifugal and Reciprocating pumps.

TEXT BOOKS:

1. A textbook of Fluid Mechanics and Hydraulic Machines by Dr. R.K. Bansal, Laxmi Publications (P) Ltd., New Delhi, 10th Edition, 2018
2. Hydraulics and Fluid Mechanics including Hydraulic Machines by Dr. P.N. Modi and Dr. S.N. Seth, Standard Book house, Rajsons Pvt. Ltd., 21st Edition, 2017

Year/Sem	IV Sem	L	T	P	C	COURSE CODE
Regulation Year	2018-2019	0	0	2	1	V18CEL06
Name of the Course	ENGINEERING GEOLOGY LAB					
Branch	CIVIL ENGINEERING					

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- Understand the importance of geology in civil engineering
- Identify the geological process of any region to carry civil engineering works
- Evaluate the formation and properties of minerals, rocks and soil
- Develop the ability to prepare geological maps and sections to interpret site conditions

LIST OF EXPERIMENTS

1. Physical properties of minerals and their megascopic identification
2. Rock forming minerals: Quartz group, Feldspar group, Garnet group, Mica group, Talc, Chlorite, Olivine, Kyanite, Asbestos, Tourmelene, Calcite, Gypsum etc.
3. Ore forming minerals: Magnetite, Hematite, Pyrite, Pyralusite, Graphite, Chromite etc.
4. Megascopic description and identification of rocks
5. Igneous rocks: Granite, Pegmatite, Gabbro, Dolerite, Syenite, Granite Poryphery, Basalt, etc.
6. Sedimentary rocks: Sand stone, Ferruginous sand stone, Lime stone, Shale, Laterite, Conglamorate, etc.
7. Metamorphic rocks: Biotite, Granite Gneiss, Slate, Muscovite & Biotiteschist, Marble, Khondalite, etc.
8. Interpretation and drawing of sections for geological maps showing tilted beds, faults, unconformities etc.
9. Simple Structural Geology problems
10. Bore hole data
11. Strength of the rock using laboratory tests
12. Field work to identify Minerals and Rocks, Geomorphology and Structural Geology

REFERENCES

1. Applied Engineering Geology Practicals by M T Maruthesha Reddy, New Age International Publishers, Second Edition, 2007.
2. Foundations of Engineering Geology by F G Bell, B S Publications, first edition, 2005.