

# **COURSE STRUCTURE & DETAILED SYLLABUS**

**ACE - R20**

**CIVIL ENGINEERING**

## **B. TECH FOUR YEAR DEGREE COURSE STRUCTURE & SYLLABUS**

(2020 Batch)

II Year I Semester



**ACE**

**Engineering College**

**Ankushapur(V), Ghatkesar(M) - 501 301**

***(An Autonomous Institution, Affiliated to JNTUH, Hyderabad)***



**ACE**  
**Engineering College**  
 Ankushapur(V), Ghatkesar(M), Medchal.Dist - 501 301  
**(Autonomous)**

**B.TECH. FOUR YEAR DEGREE COURSE**  
**CIVIL ENGINEERING**  
**COURSE STRUCTURE**  
**II Year I Semester**

II Year				I Semester			
S.No	Course Type	Course Code	Course Title	Periods Per Week			Credits
				L	T	P	
1	PCC	CE301PC	Surveying and Geomatics	3	0	0	3
2	PCC	CE302PC	Engineering Geology	2	0	0	2
3	PCC	CE303PC	Strength of Materials – I	3	1	0	4
4	BSC	MA304BS	Probability and Statistics	3	1	0	4
5	PCC	CE305PC	Fluid Mechanics	3	1	0	4
6	PCC	CE306PC	Surveying Lab	0	0	3	1.5
7	PCC	CE307PC	Strength of Materials Lab	0	0	3	1.5
8	PCC	CE308PC	Engineering Geology Lab	0	0	2	1
9	MC	MC309	Constitution of India	3	0	0	0
<b>Total</b>				<b>17</b>	<b>3</b>	<b>8</b>	<b>21</b>

**CE301PC: SURVEYING AND GEOMATICS**

B.Tech. II Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE301PC	PCC	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: 0	Practical Classes: 0			Total Classes: 45			
Prerequisite: Student should have knowledge about Basic Mathematics and idea about basic land measurement unit terminology.								
Course Objectives: The object of the course student should have the capability to: <ul style="list-style-type: none"> <li>• Know the principle and methods of surveying.</li> <li>• Measure horizontal and vertical- distances and angles</li> <li>• Recording of observation accurately and perform calculations based on the observation</li> <li>• Identification of source of errors and rectification methods</li> <li>• Apply surveying principles to determine areas and volumes and setting outcurves</li> <li>• Use modern surveying equipment's for accurate results</li> </ul>								
Course Outcomes: Course will enable the student to: <ul style="list-style-type: none"> <li>• Apply the knowledge to calculate angles, distances and levels</li> <li>• Identify data collection methods and prepare field notes</li> <li>• Understand the working principles of survey instruments, measurement errors and corrective measures</li> <li>• Interpret survey data and compute areas and volumes, levels by different type of equipment and relate the knowledge to the modern equipment and methodologies</li> </ul>								
Unit: I	Introduction and Basic Concepts				No. of Classes: 09			
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. Prismatic Compass- Bearings, included angles, Local Attraction, Magnetic Declination and dip.								
Unit: II	Leveling, Contouring, Areas, Volumes				No. of Classes: 09			
Leveling- Types of levels and levelling staves, temporary adjustments, methods of levelling, booking and Determination of levels, Effect of Curvature of Earth and Refraction. Contouring- Characteristics and uses of Contours, methods of contour surveying. Areas - Determination of areas consisting of irregular boundary and regular boundary. Volumes - Determination of volume of earth work in cutting and embankments for level section, volume of borrow pits, capacity of reservoirs.								
Unit: III	Theodolite Surveying, Traversing				No. of Classes: 09			
Theodolite Surveying: Types of Theodolites, Fundamental Lines, temporary adjustments, measurement of horizontal angle by repetition method and reiteration method, measurement of vertical Angle, Trigonometrical levelling when base is accessible and inaccessible. Traversing: Methods of traversing, traverse computations and adjustments, Omitted measurements.								
Unit: IV	Curves, Tacheometric Surveying, Modern Surveying				No. of Classes: 09			
Curves: Types of curves and their necessity, elements of simple, compound, reverse, transition								

and vertical curves.

Tacheometric Surveying: Principles of Tacheometry, stadia and tangential methods of Tacheometry.

Modern Surveying Methods: Principle and types of E.D.M. Instruments, Total station-advantages and Applications. Field Procedure for total station survey, Errors in Total Station Survey, Global Positioning System- Principle and Applications.

Unit: V

Photogrammetry Surveying

No.of Classes: 09

Photogrammetry Surveying: Introduction, Basic concepts, perspective geometry of aerial photograph, relief and tilt displacements, terrestrial photogrammetry, flight planning; Stereoscopy, ground control extension for photographic mapping- aerial triangulation, radial triangulation, methods; photographic mapping- mapping using paper prints, mapping using stereoplottling instruments, mosaics, map substitutes.

Text Books:

1. Chandra A M, "Plane Surveying and Higher Surveying", New age International Pvt. Ltd., Publishers, NewDelhi.
2. Duggal S K, "Surveying (Vol – 1 & 2), Tata McGraw Hill Publishing Co. Ltd. NewDelhi.

Reference Books:

1. Arthur R Benton and Philip J Taety, Elements of Plane Surveying, McGrawHill.
2. Surveying and levelling by R. Subramanian, Oxford university press, NewDelhi.
3. Arora K R "Surveying Vol 1, 2 & 3), Standard Book House, Delhi.
4. Surveying (Vol – 1, 2 &3), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., NewDelhi.

Web References:

1. [https://www.youtube.com/watch?v=chhuq\\_t40rY&list=PL20A0651466E8A776](https://www.youtube.com/watch?v=chhuq_t40rY&list=PL20A0651466E8A776)
2. <https://www.youtube.com/watch?v=sjgX2Sfh9PA>
3. <https://www.youtube.com/watch?v=KFm5DT0Ey7g>

E-Text Books:

1. [https://books.google.co.in/books/about/Textbook\\_of\\_Surveying.html?id=dF3oDzQ6KgC](https://books.google.co.in/books/about/Textbook_of_Surveying.html?id=dF3oDzQ6KgC)
2. <http://civilengineeringpdf.com/category/engineering-surveying-pdf/>

**CE302PC: ENGINEERING GEOLOGY**

B.Tech. II Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE302PC	PCC	L	T	P	C	CIA	SEE	Total
		2	0	0	2	30	70	100
Contact Classes: 30	Tutorial Classes: 0	Practical Classes: 0			Total Classes: 30			
Prerequisite: Engineering Physics, Chemistry.								
<p>Course Objectives: The objective of this course is:</p> <ul style="list-style-type: none"> <li>To give the basics knowledge of Geology that is required for constructing various Civil Engineering Structures, basic Geology, Geological Hazardous and Environmental Geology</li> <li>To focus on the core activities of engineering geologists – site characterization and geologic hazard identification and mitigation. Planning and construction of major Civil Engineering projects</li> </ul>								
<p>Course Outcomes: At the end of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>Site characterization and how to collect, analyze, and report geologic data using standards in engineering practice</li> <li>The fundamentals of the engineering properties of Earth materials and fluids.</li> <li>Rock mass characterization and the mechanics of planar rock slides and topples</li> </ul>								
Unit: I	Introduction and Weathering of Rocks				No. of Classes: 06			
<p>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.</p> <p>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”</p>								
Unit: II	Mineralogy and Petrology				No. of Classes: 06			
<p>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: Feldsper, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Study of other common economics minerals such as Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite.</p> <p>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, Laerite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.</p>								
Unit: III	Structural Geology				No. of Classes: 06			
<p>Structural Geology: Out crop, 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, Stabilisation of soils. Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration.</p>								
Unit: IV	Earth Quakes, Importance of Geophysical Studies				No. of Classes: 06			

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 Geophysical Studies: Principles of geophysical study by Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radio metric 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	No.of Classes: 06
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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. Factors 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. Tithological, structural and ground water) in tunneling over break and lining in tunnels.

Text Books:

1. Engineering Geology by N. Chennakesavulu, McMillan, India Ltd.2005.
2. Engineering Methods by D. Venkat Reddy; Vikas Publishers2015.
3. Engineering Geology by S K Duggal, H K Pandey Mc Graw Hill Education Pvt. Ltd.2014.
4. Principles of Engineering Geology by K.V.G.K. Gokhale – B.S.Publications.

Reference Books:

1. F.G. Bell, Fundamental of Engineering B.S. Publications, 2005.
2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers Distribution.
3. Engineering Geology by Subinoy Gangopadhyay, Oxford University Press.
4. Engineering Geology for Civil Engineers – P.C. Varghese PHI.

Web References:

1. [www.ndl.iitkgp.ac.in](http://www.ndl.iitkgp.ac.in)
2. [www.digitallibrary.ngri.res.in](http://www.digitallibrary.ngri.res.in)
3. [www.gsi.gov.in](http://www.gsi.gov.in)
4. [www.ncss.gov.in](http://www.ncss.gov.in)
5. [www.loc.gov.in](http://www.loc.gov.in)
6. [www.geosocindia.org](http://www.geosocindia.org)

E-Text Books:

1. [www.kopykitab.com](http://www.kopykitab.com)
2. [www.geoshare.in](http://www.geoshare.in)
3. [www.azomining.com](http://www.azomining.com)

**CE303PC: STRENGTH OF MATERIALS – I**

B.Tech. II Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE303PC	PCC	L	T	P	C	CIA	SEE	Total
		3	1	0	4	30	70	100
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: 0			Total Classes: 60			
Prerequisite: Engineer Mechanics								
<p>Course Objectives: The objective of this Course is:</p> <ul style="list-style-type: none"> <li>To understand the nature of stresses developed in simple geometries such as bars, cantilevers and beams for various types of simple loads</li> <li>To calculate the elastic deformation occurring in simple members for different types of loading.</li> <li>To show the plane stress transformation with a particular coordinate system for different orientation of the plane.</li> <li>To know different failure theories adopted in designing of structural members</li> </ul>								
<p>Course Outcome: On completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>Describe the concepts and principles, understand the theory of elasticity including strain/displacement and Hooke's law relationships; and perform calculations, related to the strength of structured and mechanical components.</li> <li>Recognize various types loads applied on structural components of simple framing geometries and understand the nature of internal stresses that will develop within the components.</li> <li>To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading</li> <li>Analyze various situations involving structural members subjected to plane stresses by application of Mohr's circle of stress, Frame an idea to design a system, component, or process</li> </ul>								
Unit: I	Simple Stresses And Strains				No. of Classes: 12			
<p>Simple Stresses And Strains: Concept of stress and strain- St. Venant's Principle-Stress and Strain Diagram - 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 – Pure shear and Complementary shear - Elastic moduli, Elastic constants and the relationship between them – Bars of varying section – composite bars – Temperature stresses.</p> <p>Strain Energy: Resilience–Gradual, sudden, and impact loadings – simple applications.</p>								
Unit: II	Shear Force And Bending Moment				No. of Classes: 12			
<p>Shear Force And Bending Moment: Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported including overhanging beams subjected to point loads, uniformly distributed load, uniformly varying load, couple and combination of these loads – Point of contraflexure – Relation between S.F., B.M and rate of loading at a section of a beam.</p>								
Unit: III	Flexural Stresses& Shear Stresses				No. of Classes: 12			
<p>Flexural Stresses: Theory of simple bending – Assumptions – Derivation of bending equation- Section Modulus Determination of flexural/bending stresses of rectangular and circular sections (Solid and Hollow), I.T, Angle and Channel sections – Design of simple beam sections.</p> <p>Shear Stresses: Derivation of formula for shear stress distribution – Shear stress distribution</p>								

across various beam sections like rectangular, circular, triangular, I, T angle and channel sections.		
Unit: IV	Deflection Of Beams & Conjugate Beam Method	No. of Classes: 12
<p>Deflection Of Beams: 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 and couple -Mohr’s theorems – Moment area method – Application to simple cases.</p> <p>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.</p>		
Unit: V	Principal Stresses & Theories Of Failure	No. of Classes: 12
<p>Principal Stresses: Introduction – Stresses on an oblique plane 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 –Principal stresses – Mohr’s circle of stresses – ellipse of stress - Analytical and graphical solutions.</p> <p>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).</p>		
<p>Text Books:</p> <ol style="list-style-type: none"> <li>1. Strength of Materials by R. K Rajput, S. Chand &amp; Company Ltd.</li> <li>2. Mechanics of Materials by Dr. B.C Punmia, Dr. Ashok Kumar Jain and Dr. Arun Kum Jain.</li> <li>3. Strength of Materials by R. Subramanian, Oxford University Press.</li> </ol>		
<p>Reference Books:</p> <ol style="list-style-type: none"> <li>1. Mechanics of Material by R.C. Hibbeler, Prentice Hall Publications.</li> <li>2. Engineering Mechanics of Solids by Egor P. Popov, Prentice Hall Publications</li> <li>3. Strength of Materials by T.D.Gunneswara Rao and M.Andal, Cambridge Publishers.</li> <li>4. Strength of Materials by R.K. Bansal, Lakshmi Publications House Pvt. Ltd.</li> <li>5. Strength of Materials by B.S.Basavarajaiah and P. Mahadevappa, 3rd Edition, Universities Press.</li> </ol>		
<p>Web References:</p> <ol style="list-style-type: none"> <li>1. <a href="http://nptel.ac.in/courses/105/105/105105108/">nptel.ac.in/courses/105/105/105105108/</a></li> </ol>		
<p>E-Text Books:</p> <ol style="list-style-type: none"> <li>1. <a href="http://civildatas.com/download/a-textbook-of-strength-of-materials-by-bansal">civildatas.com/download/a-textbook-of-strength-of-materials-by-bansal</a></li> <li>2. <a href="http://engineering108.com/Data/Engineering/Mechanical/SM/Strength_Of_Materials_parts_IandII-Timoshenko.pdf">engineering108.com/Data/Engineering/Mechanical/SM/Strength_Of_Materials_parts_IandII-Timoshenko.pdf</a></li> </ol>		

**MA304BS: PROBABILITY & STATISTICS**

<b>B.Tech. II Year I Semester</b>								
<b>Course Code</b>	<b>Category</b>	<b>Hours/Week</b>			<b>Credits</b>	<b>Maximum Marks</b>		
<b>MA304BS</b>	<b>BSC</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	1	-	4	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: 15</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 60</b>			
<b>Prerequisite:</b> Mathematical Knowledge at pre-university level								
<b>Course Objectives:</b> To learn <ul style="list-style-type: none"> <li>• The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.</li> <li>• The basic ideas of statistics including measures of central tendency, correlation and regression.</li> <li>• The statistical methods of studying data samples.</li> </ul>								
<b>Course Outcomes:</b> After learning the contents of this paper the student must be able to <ul style="list-style-type: none"> <li>• The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.</li> <li>• The basic ideas of statistics including measures of central tendency, correlation and regression.</li> <li>• The statistical methods of studying data samples.</li> </ul>								
<b>Module: I</b>	<b>Basic Probability, Random variables</b>					<b>No.of Classes: 09</b>		
<b>Basic Probability:</b> Probability spaces, conditional probability, independent events, and Bayes' theorem. <b>Random variables:</b> Discrete and continuous random variables, Expectation of Random Variables, Moments, Variance of random variables, Chebyshev's Inequality								
<b>Module: II</b>	<b>Discrete Probability distributions</b>					<b>No.of Classes: 09</b>		
<b>Discrete Probability distributions:</b> Binomial, Poisson, evaluation of statistical parameters for these distributions, Poisson approximation to the binomial distribution								
<b>Module: III</b>	<b>Continuous Random variable &amp; Distributions</b>					<b>No.of Classes: 09</b>		
<b>Continuous Random variable &amp; Distributions:</b> Continuous random variables and their properties, distribution functions and densities, Normal, exponential and gamma distributions, evaluation of statistical parameters for these distributions.								
<b>Module: IV</b>	<b>Applied Statistics</b>					<b>No.of Classes: 09</b>		
<b>Applied Statistics:</b> Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves; Correlation and regression – Rank correlation.								
<b>Module: V</b>	<b>Testing of Hypothesis</b>					<b>No.of Classes: 09</b>		
<b>Testing of Hypothesis:</b> Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means; Test for single mean, difference of means for small samples, test for ratio of variances for small samples.								
<b>Text Books:</b> <ol style="list-style-type: none"> <li>1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, keying Ye, Probability and statistics for engineers and scientists, 9th Edition, Pearson Publications.</li> <li>2. Fundamentals of Mathematical Statistics, Khanna Publications, S CGuptha and V.K. Kapoor.</li> </ol>								
<b>Reference Books:</b> <ol style="list-style-type: none"> <li>1. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations</li> <li>2. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.</li> <li>S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.</li> </ol>								

**CE305PC: FLUID MECHANICS**

B.Tech. II Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE305PC	PCC	L	T	P	C	CIA	SEE	Total
		3	1	0	4	30	70	100
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: 0			Total Classes: 60			
Prerequisite: Engineering Mechanics								
<p>Course Objectives: The objectives of the course are to:</p> <ul style="list-style-type: none"> <li>• Introduce the concepts of fluid mechanics useful in Civil Engineering applications</li> <li>• Provide a first level exposure to the students to fluid statics, kinematics and dynamics.</li> <li>• Learn about the application of mass, energy and momentum conservation laws for fluid flows</li> <li>• Train and analyse engineering problems involving fluids with a mechanistic perspective is essential for the civil engineering students</li> <li>• To obtain the velocity and pressure variations in various types of simple flows</li> <li>• To prepare a student to build a good fundamental background useful in the application- intensive courses covering hydraulics, hydraulic machinery and hydrology</li> </ul>								
<p>Course Outcomes: Upon completion of this course, students should be able to:</p> <ul style="list-style-type: none"> <li>• Understand the broad principles of fluid statics, kinematics and dynamics</li> <li>• Understand definitions of the basic terms used in fluid mechanics and characteristics of fluids and its flow</li> <li>• Understand classifications of fluid flow</li> <li>• Be able to apply the continuity, momentum and energy principles</li> </ul>								
Unit: I	Properties of Fluid & Fluid Statics					No. of Classes: 12		
<p>Properties of Fluid: Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; variation of viscosity with temperature, Newton law of viscosity; vapour pressure, boiling point, cavitation; surface tension, capillarity, Bulk modulus of elasticity, compressibility.</p> <p>Fluid Statics: Fluid Pressure: Pressure at a point, Pascals law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U-Tube Differential Manometer, Micromanometers. pressure gauges. Hydrostatic pressure and force: horizontal, vertical and inclined surfaces. Buoyancy and stability of floating bodies.</p>								
Unit: II	Fluid Kinematics & Fluid Dynamics					No. of Classes: 12		
<p>Fluid Kinematics: Classification of fluid flow: steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow; one, two- and three-dimensional flows; Stream line, path line, streak line and stream tube; stream function, velocity potential function. One, two- and three-dimensional continuity equations in Cartesian coordinates.</p> <p>Fluid Dynamics: Surface and Body forces -Euler's and Bernoulli's equation; Energy correction factor; Momentum equation. Vortex flow – Free and Forced. Bernoulli's equation to real fluid flows.</p>								
Unit: III	Flow Measurement in Pipes & Flow Over Notches & weirs					No. of Classes: 12		

Flow Measurement in Pipes: Practical applications of Bernoulli's equation: venturimeter, orifice meter and pitot tube; Momentum principle; Forces exerted by fluid flow on pipe bend.		
Flow Over Notches & Weirs: Flow through rectangular; triangular and trapezoidal notches and weirs; End contractions; Velocity of approach. Broad crested weir.		
Unit: IV	Flow through Pipes	No. of Classes: 12
Flow through Pipes: Reynolds experiment, Reynolds number, Loss of head through pipes, Darcy-Wiesbatch equation, minor losses, total energy line, hydraulic grade line, Pipes in series, equivalent pipes, pipes in parallel, siphon, branching of pipes, three reservoir problem, power transmission through pipes. Analysis of pipe networks: Hardy Cross method, water hammer in pipes and control measures.		
Unit: V	Laminar & Turbulent Flow & Boundary Layer Concepts	No. of Classes: 12
Laminar & Turbulent Flow: Laminar flow through: circular pipes, annulus and parallel plates. Boundary Layer Concepts: Boundary Layer Analysis-Assumption and concept of boundary layer theory. Boundary-layer thickness, displacement, momentum & energy thickness, laminar and Turbulent boundary layers on a flat plate; Laminar sub-layer, smooth and rough boundaries. Local and average friction coefficients. Separation and Control. Definition of Drag and Lift and types drag, magnus effect.		
Text Books:		
<ol style="list-style-type: none"> <li>1. Fluid Mechanics by Modi and Seth, Standard BookHouse.</li> <li>2. Fluid Mechanics and Hydraulic machines by Manish Kumar Goyal, PHI learning Private Limited,2015.</li> <li>3. Fluid Mechanics by R.C. Hibbeler, Pearson India Education Services Pvt.Ltd.</li> </ol>		
Reference Books:		
<ol style="list-style-type: none"> <li>1. Theory and Applications of Fluid Mechanics, K. Subramanya, Tata McGraw Hill.</li> <li>2. Introduction to Fluid Mechanics and Fluid Machines by SK Som, Gautam Biswas, Suman Chakraborty, Mc Graw Hill Education (India) Private Limited.</li> <li>3. Fluid Mechanics and Machinery, C.S.P. Ojha, R. Berndtsson and P. N. Chadramouli, Oxford University Press, 2010.</li> <li>4. Fluid mechanics &amp; Hydraulic Machines, Domkundwar &amp; Domkundwar Dhanpat Rai &amp; Co.</li> <li>5. Fluid Mechanics and Hydraulic Machines, R. K. Bansal, Laxmi Publication Pvt. Ltd.</li> </ol>		
Web References:		
<ol style="list-style-type: none"> <li>1. <a href="https://nptel.ac.in/courses/105/103/105103095/">https://nptel.ac.in/courses/105/103/105103095/</a></li> <li>2. <a href="https://nptel.ac.in/courses/105/107/105107059/">https://nptel.ac.in/courses/105/107/105107059/</a></li> <li>3. <a href="https://nptel.ac.in/courses/105/103/105103096/">https://nptel.ac.in/courses/105/103/105103096/</a></li> </ol>		
E-Text Books:		
<ol style="list-style-type: none"> <li>1. <a href="https://books.google.co.in/books?id=FzQz6A6SnyoC&amp;printsec=frontcover#v=onepage&amp;q&amp;f=false">https://books.google.co.in/books?id=FzQz6A6SnyoC&amp;printsec=frontcover#v=onepage&amp;q&amp;f=false</a></li> </ol>		

**CE306PC: SURVEYING LAB**

B.Tech. II Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE306PC	PCC	L	T	P	C	CIA	SEE	Total
		0	0	3	1.5	30	70	100
Contact Classes: 0	Tutorial Classes: 0	Practical Classes: 60			Total Classes: 60			
Prerequisite: Surveying & Geomatics, Mathematics								
<b>Course Objectives</b> <ul style="list-style-type: none"> <li>To impart the practical knowledge in the field- measuring distances, directions, angles,</li> <li>To determining R.L.'s areas and volumes</li> <li>To set out Curves, To stake outpoints, To traverse the area, To draw Plans and Maps</li> </ul>								
<b>Course Outcomes:</b> At the end of the course, the student will be able to: <ul style="list-style-type: none"> <li>Apply the principle of surveying for civil Engineering Applications</li> <li>Calculation of areas, Drawing plans and contour maps using different measurin equipment at field level</li> <li>Write a technical laboratory report</li> </ul>								
Experiment	List of Experiments							No. of Classes
1	Surveying of an area by chain, and compass survey (closed traverse) & plotting.							5
2	Determine of distance between two inaccessible points with compass.							5
3	Radiation method, intersection methods by plane table survey.							5
4	Levelling – Longitudinal and cross-section and plotting							5
5	Measurement of Horizontal and vertical angle by theodolite							5
6	Trigonometric leveling using theodolite							5
7	Height and distances using principles of tachometric surveying							5
8	Determination of height, remote elevation, distance between inaccessible points using total station							5
9	Determination of Area using total station and drawing map							5
10	Traversing using total station for drawing contour map							5
11	Stake out using total station							5
12	Setting out Curve using total station							5
<b>Lab Manual Reference:</b> <ol style="list-style-type: none"> <li><a href="https://www.iare.ac.in/sites/default/files/lab1/Surveying%20Lab%20Manual%28ACE101%29.pdf">https://www.iare.ac.in/sites/default/files/lab1/Surveying%20Lab%20Manual%28ACE101%29.pdf</a></li> <li><a href="http://bhagwantuniversity.ac.in/wp-content/uploads/2016/02/SURVEYING-LAB-MANUAL.pdf">http://bhagwantuniversity.ac.in/wp-content/uploads/2016/02/SURVEYING-LAB-MANUAL.pdf</a></li> <li><a href="http://www.aust.edu/civil/lab_manual/ce_104.pdf">http://www.aust.edu/civil/lab_manual/ce_104.pdf</a></li> <li><a href="http://www.atri.edu.in/images/pdf/departments/SurveyI%20Lab%20Manual%20Final.pdf">http://www.atri.edu.in/images/pdf/departments/SurveyI%20Lab%20Manual%20Final.pdf</a></li> <li><a href="http://www.uoh.edu.sa/Subgates/Faculties/CM/Departments/Civil/PublishingImages/Pages/Survey-lab/SURVEYING%20MANUAL_MAHAMID.pdf">http://www.uoh.edu.sa/Subgates/Faculties/CM/Departments/Civil/PublishingImages/Pages/Survey-lab/SURVEYING%20MANUAL_MAHAMID.pdf</a></li> <li><a href="http://kgr.ac.in/beta/wp-content/uploads/2018/09/surveying-lab-course-file.pdf">http://kgr.ac.in/beta/wp-content/uploads/2018/09/surveying-lab-course-file.pdf</a></li> </ol>								

7. <http://sreevahini.edu.in/pdf/surveying-1.pdf>
8. <http://www.geethanjaliinstitutions.com/engineering/coursefiles/downloads/civil/sur-2%20lab.pdf>
9. <http://www.geethanjaliinstitutions.com/engineering/coursefiles/downloads/civil/sur-2%20lab.pdf>
10. <http://www.atri.edu.in/images/pdf/departments/SURVEYING%20LAB%20MANUAL.pdf>
11. <https://www.youtube.com/watch?v=Ik7wKksW11k&list=PLCjR4MHTgTBgZqMfDmBq82xIpr7kNhTD8>

**Web References:**

1. Chain Survey: <https://www.youtube.com/watch?v=mnnOPTlyOIU>
2. Compass Survey: <https://www.youtube.com/watch?v=afokWKWOMxY>
3. Plane Table Survey: <https://www.youtube.com/watch?v=rBN7ta9K5nM>
4. Levelling Exercise: <https://www.youtube.com/watch?v=KzyaksQM3ZU>
5. Theodolite Survey: <https://www.youtube.com/watch?v=MA-11DqRtjI>
6. Tacheometric Survey: <https://www.youtube.com/watch?v=u5McIIB7Blk>
7. Profile Levelling: [https://www.youtube.com/watch?v=dqx-It\\_IH7A](https://www.youtube.com/watch?v=dqx-It_IH7A)
8. Total Station Survey: <https://www.youtube.com/watch?v=RXHjHCIVT0g>
9. GPS (Hand Held) Survey: <https://www.youtube.com/watch?v=8JqOR1wdwtc>

**List of Equipments :**

S.No	Name of the Instruments	No	Total
1	Chains	10	245
2	Ranging Rods	35	
3	Cross Staff	10	
4	Arrows	180	
5	Tape	10	
6	Optical Square	4	15
7	Prismatic Compass with Tripod	11	40
8	Plain Table With Accessories	10	
9	Dumpy Level with Tripod	10	20
10	Leveling Staffs	10	
11	Box Sextant	3	06
12	Digital Planimeter & Planimeter	3	
13	Theodolite	10	10
14	Total Station	05	05
15	G.P.S	04	04

**CE307PC: STRENGTH OF MATERIALS LAB**

B.Tech. II Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE307PC	PCC	L	T	P	C	CIA	SEE	Total
		0	0	3	1.5	30	70	100
Contact Classes: 0	Tutorial Classes: 0	Practical Classes: 60			Total Classes: 60			
Prerequisite: Engineering Mechanics, Physics, Mathematics, Strength of Materials I								
<b>Course Objectives:</b> <ul style="list-style-type: none"> <li>• Make measurements of different strains, stress and elastic properties of materials used in Civil Engineering.</li> <li>• Provide physical observations to complement concepts learnt</li> <li>• Introduce experimental procedures and common measurement instruments, equipment, devices.</li> <li>• Exposure to a variety of established material testing procedures and techniques</li> <li>• Different methods of evaluation and inferences drawn from observations</li> </ul>								
<b>Course Outcomes:</b> At the end of the course the student will be able to: <ul style="list-style-type: none"> <li>• Configure &amp; Operate a data acquisition system using various testing machines of solid materials</li> <li>• Compute and Analyze engineering values (e.g. stress or strain) from laboratory measurements.</li> <li>• Write a technical laboratory report</li> </ul>								
Experiment	List of Experiments							No. of Classes
1	Tension test							5
2	Bending test on (Steel / Wood) Cantilever beam.							5
3	Bending test on simple support beam.							5
4	Torsion test							5
5	Hardness test							5
6	Spring test							5
7	Compression test on wood or concrete							5
8	Impact test							5
9	Shear test							5
10	Verification of Maxwell's Reciprocal theorem on beams.							5
11	Use of electrical resistance strain gauges							5
12	Continuous beam – deflection test.							5
<b>Lab Manual Reference :</b> <ol style="list-style-type: none"> <li>1.S.P. Timoshenko history of strength of materials Dover publications.</li> <li>2.Crandall, dahi &amp; lardner "An introduction to mechanics of solids Mc Grawhill.</li> </ol>								
<b>E Manual link:</b> <ol style="list-style-type: none"> <li>1.<a href="https://www.youtube.com/channel/UCLUo8ZpVb4R-rHjTmsJjYjw">https://www.youtube.com/channel/UCLUo8ZpVb4R-rHjTmsJjYjw</a></li> </ol>								
<b>Web References</b> <ol style="list-style-type: none"> <li>1. <a href="https://www.youtube.com/watch?v=3H0c2zOcip0">https://www.youtube.com/watch?v=3H0c2zOcip0</a></li> <li>2. <a href="https://www.youtube.com/watch?v=3H0c2zOcip0">https://www.youtube.com/watch?v=3H0c2zOcip0</a></li> </ol>								

3. <https://www.youtube.com/watch?v=pS2HSTwHpSw>4. [https://www.youtube.com/watch?v=NIWVmp\\_q\\_XE](https://www.youtube.com/watch?v=NIWVmp_q_XE)

## List of Equipments:

S.NO	NAME OF THE EQUIPMENT	QUANTITY
1	Universal Testing Machine	1
2	Torsion Testing Machine	1
3	Hardness Testing Machine	1
4	Impact Testing Machine	1
5	Spring Testing Machine	1
6	Continuous Beam Setup	1
7	Simple Supported Beam Setup	1
8	Cantilever Beam Setup	1
9	Shear Test Apparatus	1
10	Electrical Resistance Strain Gauges	5
11	Digital Strain Indicator	1
12	Compression Testing Machine	1

**CE308PC: ENGINEERING GEOLOGY LAB**

B.Tech. II Year I Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE308PC	PCC	L	T	P	C	CIA	SEE	Total
		0	0	2	1.0	30	70	100
Contact Classes: 0	Tutorial Classes: 0	Practical Classes: 30			Total Classes: 30			
Prerequisite: Engineering Physics and Chemistry.								
Course Objectives: The objective of this lab is that to provide practical knowledge about physical properties of minerals, rocks, drawing of geological maps, showing faults, uniformities etc.								
Course Outcomes: At the end of the course, the student will be able to: <ul style="list-style-type: none"> <li>• Understands the method and ways of investigations required for Civil Engineering projects</li> <li>• Identify the various rocks, minerals depending on geological classifications</li> <li>• Will able to learn to couple geologic expertise with the engineering properties of rock and unconsolidated materials in the characterization of geologic sites for civil work projects and the quantification of processes such as rock slides and settlement.</li> <li>• Write a technical laboratory report</li> </ul>								
Experiment	List of Experiments							No. of Classes
1	Study of physical properties of minerals.							3
2	Study of different group of minerals							3
3	Study of Crystal and Crystal system.							3
4	Identification of minerals: Silica group: Quartz, Amethyst, Opal; Feldspar group: Orthoclase, Plagioclase; Cryptocrystalline group: Jasper; Carbonate group: Calcite; Element group: Graphite; Pyroxene group: Talc; Mica group: Muscovite; Amphibole group: Asbestos, Olivine, Hornblende, Magnetite, Hematite, Corundum, Kyanite, Garnet, Galena, Gypsum.							3
5	Identification of rocks (Igneous Petrology): Acidic Igneous rock: Granite and its varieties, Syenite, Rhyolite, Pumice, Obsidian, Scoria, Pegmatite, Volcanic Tuff. Basic rock: Gabbro, Dolerite, Basalt and its varieties, Trachyte.							3
6	Identification of rocks (Sedimentary Petrology): Conglomerate, Breccia, Sandstone and its varieties, Laterite, Limestone and its varieties, Shales and its varieties.							3
7	Identification of rocks (Metamorphic Petrology): Marble, slate, Gneiss and its varieties, Schist and its varieties. Quartzite, Phyllite.							3
8	Study of topographical features from Geological maps. Identification of symbols in maps.							3
9	Simple structural Geology Problems (Folds, Faults & Unconformities).							3
10	Ground water exploration test using electric resistivity meter.							3
Lab Examination Pattern								

1. Description and identification of Six minerals
2. Description and identification of Six (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.

Lab manual References :

1. Engineering Geology Lab Record/Manual By Dr. N. Chenna Kesavulu. Trini Publications.
2. Engineering Geology Practicals By M T Maruthesha Reddy, New Age International Publisher.

E Manual links:

1. [vlab.co.in/broad-area-civil-engineering](http://vlab.co.in/broad-area-civil-engineering)

Web References:

1. [www.ndl.iitkgp.ac.in](http://www.ndl.iitkgp.ac.in)
2. [www.digitallibrary.ngri.res.in](http://www.digitallibrary.ngri.res.in)
3. [www.gsi.gov.in](http://www.gsi.gov.in)
4. [www.ncss.gov.in](http://www.ncss.gov.in)
5. [www.loc.gov.in](http://www.loc.gov.in)
6. [www.geosocindia.org](http://www.geosocindia.org)

List of Equipments:

S.No.	Name of the Equipment	Nos.
1	Rock Specimens	120
2	Mineral Specimens	132
3	Models of Structural geology	24
4	Geological Maps of India	1
5.	Electrical Resistivity meter	1

**MC309HS: CONSTITUTION OF INDIA**

<b>B.Tech. II Year I Semester</b>								
<b>Course Code</b>	<b>Category</b>	<b>Hours/Week</b>			<b>Credits</b>	<b>Maximum Marks</b>		
<b>MC309HS</b>	<b>MC</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CIA</b>	<b>SEE</b>	<b>Total</b>
		3	-	-	0	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			

**Prerequisite:** Nil

The Constitution of India is the supreme law of India. Parliament of India cannot make any law which violates the Fundamental Rights enumerated under the Part III of the Constitution. The Parliament of India has been empowered to amend the Constitution under Article 368, however, it cannot use this power to change the “basic structure” of the constitution, which has been ruled and explained by the Supreme Court of India in its historical judgments. The Constitution of India reflects the idea of “Constitutionalism” – a modern and progressive concept historically developed by the thinkers of “liberalism” – an ideology which has been recognized as one of the most popular political ideology and result of historical struggles against arbitrary use of sovereign power by state. The historic revolutions in France, England, America and particularly European Renaissance and Reformation movement have resulted into progressive legal reforms in the form of “constitutionalism” in many countries. The Constitution of India was made by borrowing models and principles from many countries including United Kingdom and America.

The Constitution of India is not only a legal document but it also reflects social, political and economic perspectives of the Indian Society. It reflects India’s legacy of “diversity”. It has been said that Indian constitution reflects ideals of its freedom movement; however, few critics have argued that it does not truly incorporate our own ancient legal heritage and cultural values. No law can be “static” and therefore the Constitution of India has also been amended more than one hundred times. These amendments reflect political, social and economic developments since the year 1950. The Indian judiciary and particularly the Supreme Court of India has played an historic role as the guardian of people. It has been protecting not only basic ideals of the Constitution but also strengthened the same through progressive interpretations of the text of the Constitution. The judicial activism of the Supreme Court of India and its historic contributions has been recognized throughout the world and it gradually made it “as one of the strongest court in the world”.

**Course content**

1. Meaning of the constitution law and constitutionalism
2. Historical perspective of the Constitution of India
3. Salient features and characteristics of the Constitution of India
4. Scheme of the fundamental rights

5. The scheme of the Fundamental Duties and its legal status
6. The Directive Principles of State Policy – Its importance and implementation
7. Federal structure and distribution of legislative and financial powers between the Union and the States
8. Parliamentary Form of Government in India – The constitution powers and status of the President of India
9. Amendment of the Constitutional Powers and Procedure
10. The historical perspectives of the constitutional amendments in India
11. Emergency Provisions: National Emergency, President Rule, Financial Emergency
12. Local Self Government – Constitutional Scheme in India
13. Scheme of the Fundamental Right to Equality
14. Scheme of the Fundamental Right to certain Freedom under Article 19
15. Scope of the Right to Life and Personal Liberty under Article 21