

**SYLLABUS FOR
BE III-SEMESTER
(CBCS)**

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

BUILDING PLANNING AND DRAWING
SYLLABUS FOR B.E. III-SEMESTER

Instruction	:	2 +2 period per Week	Semester End Exam	:	70	Subject Reference Code	:	ES310CE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>The course objectives are to</i>	<i>Upon the completion of this course students will be able to</i>
1. Expose students to the concepts of building planning and various aspects of green buildings 2. Impart knowledge on the preparation and presentation of civil engineering drawings with relevant conventional signs	1. Apply the principles of planning and bylaws used for building planning 2. Provide scope and provisions for building components and services integrating concepts of green buildings 3. Draw conventional signs and brick bonds 4. Prepare detailed working drawing of doors, windows and staircases 5. Draw plan, elevation and section of simple load bearing and framed building structures

UNIT-I

Building Planning: Basic building elements, site selection for buildings, Principles of planning. Relevant building bylaws National Building Code (NBC) & Municipal, orientation of buildings. Provision of rainwater harvesting, provision for physically handicapped facilities.

UNIT-II

Building services: Fire protection – classes of fire and causes, development of fire, fire resisting materials, means of escape, Standing Fire Advisory Council norms. Water supply - Water distribution and plumbing fixtures.

Green Building: Concept of Green building, Principles of green buildings , Eco-friendly materials, Certification systems – Green Rating for Integrated Habitat Assessment (GRIHA) and Leadership in Energy and Environmental Design (LEED).

UNIT-III

Conventional Signs: Conventional representation of building materials in section- Representation of building elements- doors, windows, ventilators, cupboards and grills in plan, Representation of electrical and plumbing services. Bricks and brick sections in isometric view.

Brick Bonds: Plan and isometric view of wall junctions for half brick wall; one and one and a half brick wall; brick masonry courses in English bond and Flemish bond.

UNIT-IV

Doors and Windows: Plan, section and elevation of a fully panelled door and fully panelled window, panelled venetian and glazed doors.

Stair Cases: Types of stair cases, Reinforced Concrete (RC) stair cases – dog legged, open well and bifurcated. Steel spiral stair case.

UNIT-V

Building Drawing: Plans, elevations and sections of simple load bearing and framed building structures.

Suggested Books:

1. Kumara Swamy N., Kameswara Rao A., Building Planning And Drawing, Charotar Publications, 2013.
2. Shahane Y. S, Planning and Designing Building, Allies Book Stall, 2004.
3. Shah M.G., Kalae C.M. and Patki, S.Y., Building Drawing, Tata McGraw Hill Book Co., 2002.

Reference Books :

1. Joseph De Chiara, Michael J. Crosbie, Time-saver standards for building types, McGraw-Hill, 2001.
2. Green Rating for Integrated Habitat Assessment (GRIHA) guidelines.
3. David V. Chadderton, Building Services Engineering, 2013.
4. Tom Woolley, Sam Kimmins, Paul Harrison and Rob Harrison, *Green Building, Handbook*, Volume I, Spon Press, 2003.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

STRENGTH OF MATERIALS – I
SYLLABUS FOR B.E. III-SEMESTER

Instruction	: 3 +1 period per Week	Semester End Exam	: 70	Subject Reference Code	: PC310CE
Credits	: 3	Sessional Marks	: 30	Duration of Sem. End Exam	: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will:</i>	<i>Upon the completion of course students will be able to:</i>
1. Examine and interpret basic concepts of Strength of materials and analyze statically determinate and indeterminate structures. 2. Analyze simple beams subjected to various types of loading and plot shear force and bending moment diagrams and compute bending stresses. 3. Define and analyze shear stresses in beams and plot shear stress distribution across cross section of beams 4. Define and analyze problem of columns subjected to direct and bending stresses 5. Define the concepts of compound stresses and strains in beams and also Investigate the behaviour of thin cylinder, spherical shells and thick cylinders	1. Express understanding of the basic concepts and principles of Strength of materials and solve problems of composite sections, statically determinate and indeterminate structures. 2. Construct shear force and bending moment diagrams for beams and compute stresses and strains in bending and shear in the cross section of beams subjected to transverse loading. 3. Compute direct and bending stresses in columns and beams subjected to eccentric loading. 4. Identify and interpret the governing equation for compound stress and strains and compute the principal stress and strains 5. Compute stresses in thin cylinders, spherical shells and thick cylinders subjected to internal and external pressure.

UNIT-I

Simple Stresses and Strains: Definitions, types of stresses and strains. SI units, and notation. Hooke's law, modulus of elasticity, stress-strain curves for mild steel and typical engineering materials. Ductile and brittle materials. Working stress and factor of safety. Deformation of bars under axial loads; prismatic and non-prismatic bars. Deformations due to self-weight. Bars of uniform strength. Poisson's ratio; volumetric strain and restrained strains. Relationship between elastic constants. Compound bars and temperature stresses. Statically indeterminate problems in tension and compression.

UNIT-II

Shear Force and Bending Moment: Definitions. Different types of beams and loads; shears force and bending moment diagrams for cantilever and simply supported beams with and without overhangs subjected to different types of loads viz., point loads, uniformly distributed loads, uniformly varying loads and couples. Relationship between loading, shear force and bending moment.

UNIT-III

Bending Stresses in Beams: Theory of simple bending. Moment of resistance, Elastic section modulus of section. Stresses in beams of various cross sections; flitched beams.

Shear Stresses in Beams: Distribution of transverse shear stresses over rectangular, circular, triangular, I- and T- sections.

UNIT-IV

Direct and Bending Stresses: Distribution of stresses over symmetrical sections under combined axial load and bending moment. Cores of solid and hollow circular and rectangular sections.

Compound stresses and strains: Principal stresses. Ellipse of stress. Mohr's circle for biaxial stresses. Principal strains. Introduction to failure theories.

UNIT-V

Thin Cylinders and spherical shells: Thin Cylinders subjected to internal fluid pressure; wire wound cylinders & shells

Thick Cylinders: Stresses under internal and external pressure. Compound cylinders.

Suggested Books:

1. Ferdinand P. Beer, E. Russell Johnston, John T. Dewolf, Mechanics of Materials, 2017.
2. Ramamrutham S., Narayanan R., Strength of Materials, Dhanpat Rai Publishing Company, New Delhi, 2011.
3. Bansal R.K., A text book of Strength of Materials, Laxmi Publications, New Delhi, 2010.

References Books:

1. Rajput R.K., Strength of Materials, S.Chand Publications, New Delhi, 2006.
2. Junnarkar S.B., Mechanics of Structures (Vol-I & II), Charotar Publishing House, Anand, 2002.
3. Pytel and Singer F.L., Strength of Materials, Harper & Row, New York, 1998.
4. Subramanian R., Strength of Materials, Oxford University Press, 2010.
5. Hibbeler R., Mechanics of Materials, Pearson Publishers, 2017.
6. Bhavikatti.S.S, Strength of Materials, Vikas Publishers, 2013.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
SURVEYING – I
SYLLABUS FOR B.E. III-SEMESTER

Instruction	:	3 period per Week	Semester End Exam	:	70	Subject Reference Code	:	PC320CE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Learn the basic concepts and use of surveying in Civil Engineering 2. Understand the measurement techniques and equipment used in land surveying such as chain/tape, compass, plane table and level with respect to equipments used, methods, errors and analysis of data 3. Acquire knowledge on use of theodolite and total station equipment, its adjustments, measurements, methods employed, errors and computation of data.	1. Employ basic surveying operations and computations using chain/tape and compass 2. Identify the instruments used, principles adopted and methods involved in plane table surveying. 3. Illustrate the levelling operations and apply the principles of levelling and contouring and prepare contour maps . 4. Compute areas and volumes for the given data 5. Interpret the principles of measurement of angles with theodolite and total station, make traverse computations and identify omitted measurements in traverse and give solutions to such problems

UNIT-I

Introduction to Surveying: Plane and Geodetic surveying, Principle of surveying, Classification of surveys.

Chain Surveying: Principles of chain survey, Accessories and instruments employed in chain survey. Chain surveying concepts including ranging

Compass Surveying: Use and adjustment of prismatic and surveyor's compass. Methods of surveying with a compass, Bearing systems and conversions, Magnetic declination, Dip, local attraction. Errors in prismatic survey.

UNIT-II

Plane Table Surveying: Instruments employed in plane table survey and their use, importance of orientation and different methods of orientation, Various methods of plane table survey, Three-point and two-point problems, Errors in plane table survey.

UNIT-III

Levelling: Definitions and principles of levelling, components of various levelling instruments, Use and adjustment of leveling instruments. Terms used in levelling, booking and reduction of levels. Establishment of bench marks by leveling. Longitudinal leveling, Cross-section leveling, Fly levelling, and Reciprocal leveling. Errors in levelling; curvature and refraction corrections. Sensitivity of bubble tube.

Contouring: Definition and characteristics of contours, Direct and indirect methods of contouring, Interpolation of contours, Uses of contours.

UNIT-IV

Computation of areas: Simpsons rule, Trapezoidal rule, Meridian distance method, Double meridian distance method, Double parallel distance method, Departure and total latitude method, coordinates method, Introduction to planimeter.

Computation of volumes: Computation of area of cross section for level section, two level section, side hill two level section, three level section and multi level section. Volume of earthwork by trapezoidal and prismoidal method. Volume from spot levels and contour plans

UNIT-V

Theodolite and Total station surveying: Introduction to digital theodolite and total station, Electronic distance measurement concepts, Measurement of horizontal and vertical angles, Measurement of distances

Introduction to total station – Concepts, capabilities and functions

Traversing and Computations: Methods of traversing, Checks in open and closed traverse, Computation of latitude and departures, consecutive and independent coordinates, closing error and its adjustment by Bowditch method, Transit rule and Graphical method. Gale's traverse table, omitted measurements in traverse and their computations. Errors in theodolite survey.

Suggested Books:

1. Punmia B.C., Ashok Kumar Jain, Arun Kumar Jain, Surveying, Vol. 1 and 2, Laxmi Publications, 2016.
2. Arora K.R., Surveying, Vol.1, 2 and 3, Standard Publishers Distributors, 2010.
3. Duggal S K, Surveying Volume 1, Fourth edition, Mc. Graw Hill Education Pvt Ltd 2013.

References Books:

1. David Clark, Plane and Geodetic Surveying for Engineers, Vol.1 and 2, CBS Publishers and Distributors Pvt. Ltd, 2004.
2. Kanetker T.P. and Kulkarni S.V., Surveying and Levelling, Pune Vidyarthi Gruha Prakshan, Pune, 2014.
3. Venkatramaiah C., A Text Book of Surveying, University Press, Hyderabad, 2011.

Online Resources:

1. NPTEL Course (www.nptel.ac.in)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

GEOLOGY
SYLLABUS FOR B.E. III-SEMESTER

Instruction	:	3 period per Week	Semester End Exam	:	70	Subject Reference Code	:	BS320CE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Describe the various properties of minerals, distinguishing features of rocks. 2. Describe the geological structures, processes of weathering and classification of soils. 3. Explain the process of ground water exploration. 4. Illustrate the knowledge of geological studies for dams and reservoirs. 5. Illustrate the knowledge of geological studies for tunnels, list the causes and effects of earth quakes, tsunamis and landslides with their mitigation measures.	1. Identify the different minerals and distinguishing features exhibited by the rocks 2. Identify the geological structures like folds, faults, joints and unconformities present in rocks and describe the processes of weathering, classify and distribution of soils. 3. Assess the occurrence of ground water in various lithological formations and location of bore wells. 4. Evaluate the suitability of site for the dam construction. 5. Evaluate the suitability of site for the tunnel construction, recognize the causes and effects of earth quakes, and land slides and suggest mitigation measures.

UNIT-I

Mineralogy: Definition of mineral and crystal, physical properties used in the identification of minerals, physical properties of quartz, feldspars, hornblende, biotite, muscovite, talc, olivine, calcite, kyanite and garnet.

Rocks: Textures and structures of igneous, sedimentary and metamorphic rocks. Geological description and Indian occurrence of granite, basalt, dolerite, gabbro, laterite, sandstone, shale, limestone, slate, gneiss, quartzite, marble.

UNIT-II

Geological Structures: Classification, mode of origin and engineering importance of folds, faults, joints and unconformities.

Rock Weathering: Processes and end-products of weathering. Susceptibility of rocks to weathering; assessment of the degree of weathering, tests of weatherability.

Geology of Soils: Formation of soils, soil profile, nature of parent materials, relative stability of minerals, geological classification of soils, types of Indian soils.

UNIT-III

Hydrogeology: Hydrological cycle, water table, aquifers, occurrence of ground water in various lithological formations. Ground water movement, springs. Ground water exploration.

UNIT-IV

Geology for Dams and Reservoirs: Types of dams. Dam foundations and reservoirs. Engineering and geological investigations for a masonry dam site; analysis of dam failures in the past. Engineering geology of major dam sites of India, Reservoir induced seismicity.

UNIT-V

Tunnels: Engineering geological investigations of tunnels in rock; Stand-up time of different rocks. Problems of tunnelling, pay line and over break, logging of tunnels, and geology of some well known tunnels.

Geological Hazards: Geological aspects of earthquakes and landslides.

Suggested Books:

1. Parbin Singh, Engineering and General Geology, S.K.Kataria & Sons, 2010.
2. Chennakesavulu N., Text Book of Engineering Geology, Macmillan India Ltd., 2009.
3. Gokhale K.V.G.K., Engineering Geology, B.S. Publishers, 2013.

References Books:

1. Bell F.G., Fundamentals of Engineering Geology, Aditya Books Pvt. Ltd., 2007.
2. Krynine D.P. and Judd W. R., Principles of Engineering Geology and Geotechnics, CBS Publishers & Distributors, Indian Edition, 2005.
3. Subinoy Gangopadhyay, Engineering Geology, Oxford University Press, 2013.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)**DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR BE III SEMESTER
INTRODUCTION TO ENTREPRENEURSHIP**

Instruction : 1 Hours /week	Semester End Exam Marks :35	Subject Reference Code : MC310ME
Credits : 1	Sessional Marks: :15	Duration of Semester End Exam : 2 Hours

Course objectives	Course Outcomes
<p>The objectives of this course are to :</p> <ul style="list-style-type: none"> inspire students and help them imbibe an entrepreneurial mind-set. introduce key traits and the DNA of an entrepreneur provide the information about the facilities , schemes available to start enterprise in INDIA educate the government policies and support structure for the entrepreneur improve the entrepreneur skills 	<p><i>On completion of the course, the student will be able to:</i></p> <ul style="list-style-type: none"> develop awareness about entrepreneurship and successful entrepreneurs. generate and analyse the business ideas understand the supporting organizations available to establish the business in the country understand the different government policies which support the entrepreneur understand how to Prepare a business plan report

Unit-I: Entrepreneurship: Entrepreneur characteristics – Classification of Entrepreneurships – Incorporation of Business – Forms of Business organizations –Role of Entrepreneurship in economic development –Start-ups.

Unit-II: Idea Generation and Opportunity Assessment: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for generating ideas – Opportunity Recognition – Steps in tapping opportunities.

Unit-III: Institutions Supporting Small Business Enterprises: Central level Institutions: NABARD, SIDBI, NIC, KVIC, NIESBUD, SIDO, DST, EDI, FICCI, CII, ASSOCHAM etc. – state level Institutions –DICs- SFC- SIDC- Other financial assistance.

Unit-IV: Government Policy and Taxation Benefits: Government Policy for SSIs- tax Incentives and Concessions –Non-tax Concessions –Rehabilitation and Investment Allowances.

Unit-V: entrepreneurial skills-design thinking, selling and communication. Project Formulation and Appraisal: Preparation of Project Report –Content; Guidelines for Report preparation, project report and pitching

Learning Resources:

- Bruce R. Barringer and R. Duane Ireland, "Entrepreneurship: successfully launching new ventures", 3rd edition, Pearson Prentice Hall, 2009.
- P. Denning and R. Dunham, "The Innovator's Way", MIT Press: Cambridge, Massachusetts, 2010.
- Arya Kumar, "Entrepreneurship", Pearson Education, Delhi, 2012.
- Michael H. Morris, D.F.Kuratko, J G Covin, "Corporate Entrepreneurship and Innovation", Cengage learning, New Delhi, 2010
- Peter F. Drucker, "Innovation and Entrepreneurship", Routledge Classics, 2015 .
- <https://www.wfglobal.org/initiatives/national-entrepreneurship-network/>

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

GEOGRAPHICAL INFORMATION SYSTEMS

Open Elective – I (to other branches)

SYLLABUS FOR B.E. III-SEMESTER

Instruction	:	2 period per Week	Semester End Exam	:	70	Subject Reference Code	:	OE3XXCE
Credits	:	2	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>Objectives of this course are to:</i>	<i>Upon the completion of this course the students will be expected to:</i>
1. Provide theoretical framework on fundamentals and basic concepts of GIS applications with its capabilities 2. have an in-depth understanding of the functionality of GIS and be critically aware of the potential and limitations of GIS in integrated analysis of spatial and non spatial data	1. Explain Geographic Information Systems, become familiar with the basic principles of map projections and coordinate systems and understand the requirements of different user disciplines for applying GIS technology. 2. Describe the basics of working of geographical databases, various data structures and understand the concepts of data capture, storage, analysis and outputs in a GIS environment. 3. Identify various analytical tools and functions in GIS and address various geospatial problems.

UNIT-I

Introduction: Map, definitions, representations-Point, line, polygon, common coordinate systems, Map projections – Transformations – Coordinate system – Map Analysis. History of development of Geographic Information Systems (GIS) - Standard GIS packages.

UNIT-II

Data Entry, Storage and Maintenance: Data types – spatial, non-spatial (attribute data) – data structure, data format – point line vector – Raster – Polygon – Object structural model –filters and files data in computer – Keyboard entry, Manual Digitizing, Scanner, Remotely sensed data, Existing Digital data Cartographic database, Digital elevation data, data compression.

UNIT-III

Data Analysis and Modelling: Spatial analysis, data retrieval, query (SQL) – Simple analysis, Recode overlay, Vector data analysis, Raster data analysis – Modeling in GIS – Digital elevation model – Cost and path analysis – Knowledge based systems.

Geographic Information Systems (GIS) Analysis Functions: Organizing data for analysis, classification of GIS, analysis function, maintenance and analysis of spatial data – transformations, conflation, edge matching and editing. Maintenance and analysis of non-spatial attribute data – editing and query functions.

Suggested Books:

1. Kang-Tsung Chang, Introduction to GIS, Tata McGraw Hill Edition, 2015.
2. Burrough, P.A., Principles of GIS for land resource assessment, Oxford publication, 1986.
3. Anji Reddy M., Remote Sensing and Geographic Information System, 2012.

References Books

1. John R Jensen, Ryan R Jensen, Introduction to Geographic Information System, 2013.
2. Krawkiwsky E.J. and Wells D. E., Coordinate Systems in Geodesy, 1984.
3. Stan Aronoff, Geographic Information Systems: A management perspective, Wdl Publications, 1991.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

Open Elective – I (to other branches)
BUILDING MATERIALS

Instruction	:	3 period per Week	Semester End Exam	:	70	Subject Reference Code	:	OEXXXCE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Acquire basic knowledge on building materials such as stones, bricks, cement, aggregates, mortar and concrete. 2. Study various aspects of paints, varnishes and timber.	1. Explain the characteristics of stones and bricks. 2. Describe the properties of cement, aggregate, concrete, mortar. 3. Identify the suitability of timber, paints and varnishes for building works.

UNIT-I

Stones: Classifications of stones, uses of stones as building materials, characteristics of good building stones.

Bricks: Composition of brick clay. Process of manufacturing bricks. Characteristics of good building bricks, classification of bricks. Introduction to light weight bricks.

Timber: Timber as a building material and its uses. Various types of timber. Seasoning and its importance. Preservation of wood. Plywood & Laminates and their uses.

UNIT-II

Cement: Chemical composition of cement, manufacturing process. Specifications for Ordinary Portland Cement, Types of cements.

Fine Aggregate: Characteristics of good sand and its classifications, bulking of sand. Quarry sand.

Coarse Aggregate: Characteristics of good coarse aggregates for manufacture of concrete.

Cement Mortar : Types and uses.

UNIT-III

Concrete: Designation, workability of concrete – factors affecting, Slump test, Ready Mix Concrete (RMC).

Reinforcing steel: Types of reinforcement, specifications - M.S., HYSD, TMT.

Paints : Constituents, characteristics of good paints, varnishes.

Suggested Books:

- Gambhir M.L., Neha Jamwal, Building Materials: Products, Properties and Systems, McGraw Hill Education (India) Private Limited, 2014.
- Varghese P.C., Building Materials, PHI Learning Pvt. Ltd., Delhi, 2015.
- Advances in Building Materials and Construction, Central Building Research Institute, Roorkee, 2004.

References Books:

- Duggal S.K., Building Materials, New Age Publishers, 2012
- Rangwala, Engineering Materials, Charotar Publishers, 2015

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

MECHANICS OF MATERIALS
SYLLABUS FOR B.E. III-SEMESTER

Instruction	:	3 period per Week	Semester End Exam	:	70	Subject Reference Code	:	PC330CE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Examine and interpret basic concepts of Strength of materials and analyze statically determinate and indeterminate structures to compute axial stresses, strains and deformations. 2. Analyze simple beams subjected to various types of loading and plot shear force and bending moment diagrams analytically and graphically and compute bending stresses. 3. Define and analyze shear stresses in beams and plot shear stress distribution across cross section of beams 4. Define and analyze problem of columns subjected to direct and bending stresses and predict the effect of eccentricity of loading on stresses by solution of numerical examples 5. Investigate the behaviour of thin and thick cylinders subjected to internal and external pressure and apply the concepts to the solution of example problems	1. Express understanding of the basic concepts and principles of Strength of materials and solve problems of composite sections for axial stresses and strains and thermal effects and problems of statically determinate and indeterminate structures. 2. Construct shear force and bending moment diagrams for beams subjected to various types of loading (analytically and graphically) and compute stresses and strains in bending and shear in the cross section of beams subjected to transverse loading. 3. Compute direct and bending stresses in columns and beams subjected to eccentric loading. 4. Compute internal forces in space trusses by method of tension coefficients 5. Compute stresses in thin cylinders and thick cylinders subjected to internal and external pressure.

UNIT-I

Stresses and Strains: Definitions, types of stresses and strains. Elasticity and plasticity. Hooke's law. stress-strain diagrams for engineering materials. Modulus of elasticity. Poisson's ratio. Relationship between elastic constants. Linear and volumetric strains. Bars of uniform strength. Temperature stresses. Compound bars.

UNIT-II

Shear Force and Bending Moment: Bending moment and shear force diagrams for cantilever, simply supported beams and beams with overhangs carrying point and uniformly distributed loads. Relationship between intensity of loading, shear force and bending moment. Simple theory of bending. Moment of resistance. Modulus of section.

UNIT-III

Shear Stresses in Beams: Distribution of shear stresses in rectangular, I- and T-, standard steel and hollow sections. Compound stresses, principal stresses and strains. Mohr's circle of stress.

UNIT-IV

Deflections: Slope and deflections by the method of double integration in cantilever, simply supported beams and beams with overhangs subjected to point loads and uniformly distributed loads.

Torsion: Derivation of torsion formula for circular sections. Torsional stresses, angle of twist, power transmission, effect of combined bending and torsion. Close coiled and laminated springs.

UNIT-V

Cylinders: Stresses in thin and thick cylinders with internal and external pressures. Hoop and longitudinal stresses. Stresses in compound cylinders.

Direct and bending stresses; Core of rectangular, circular, I- and T- sections.

Columns and Struts: Euler and Rankine formulae for axial load applications. Secant and Perry formulae for eccentrically loaded columns.

Suggested Books:

1. Ferdinand P. Beer, E. Russell Johnston, John T. Dewolf, Mechanics of Materials, 2017.
2. Ramamrutham S., Narayanan R., Strength of Materials, Dhanpat Rai Publishing Company, 2011.
3. Bansal R.K., A text book of Strength of Materials, Laxmi Publications, 2010.

References Books:

1. Rajput R.K., Strength of Materials, S.Chand Publications, 2006.
2. Junnarkar S.B., Mechanics of Structures (Vol-I & II), Charotar Publishing House, Anand, 2002.
3. Pytel and Singer F.L., Strength of Materials, Harper & Row, New York, 1998.
4. Subramanian R., Strength of Materials, Oxford University Press, 2010.
5. Hibbeler.R., Mechanics of Materials, Pearson Publishers, 2017
6. Bhavikatti.S.S, Strength of Materials, Vikas Publishers, 2013

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
SURVEYING-I LAB
SYLLABUS FOR B.E. III-SEMESTER

Instruction	:	2 period per Week	Semester End Exam	:	50	Subject Reference Code	:	PC331CE
Credits	:	1	Sessional Marks	:	25	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>Objectives of this course are to:</i>	<i>Upon the completion of this course students will be able to</i>
1. Develop skills for applying classroom knowledge to field problems and handling of surveying tools such as chain, compass, level, plane table, theodolite and total station.	1. Locate the objects, measure the distances and area and transfer the same onto the drawings 2. Use conventional surveying tools such as chain, compass, level, plane table, theodolite and total station in the field of civil engineering applications such as structural plotting and highway profiling 3. Apply the procedures involved in field work and to work as a surveying team 4. Plan a survey appropriately with the skill to understand the surroundings 5. Take accurate measurements, field booking, plotting and control the accumulation of errors.

LIST OF EXPERIMENTS

1. Practice of direct and indirect ranging and measuring the distance using Chain.
2. Traversing by using Compass – plotting and adjustments.
3. Plane table survey- Radiation and Intersection methods.
4. Solution to resection by Two-point problem.
5. Solution to resection by Three-point problem using trial and error method and tracing paper methods.
6. Reduction of levels by Height of Instrument (HI) & Rise and fall method.
7. Contour surveying and plotting using Grid method.
8. Horizontal and vertical distance measurement using Total Station
9. Location of ground features and contouring using total station and plotting the same.
10. Traversing using digital theodolite – distribution of errors using Gales traverse table.
11. Demonstration of minor surveying instruments.

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING**

**GEOLOGY LAB
SYLLABUS FOR B.E. III-SEMESTER**

Instruction	:	2 period per Week	Semester End Exam	:	50	Subject Reference Code	:	BS321CE
Credits	:	1	Sessional Marks	:	25	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Familiarize with the procedures for the identification of minerals, rocks and structural models. 2. Calculate the specific gravity, porosity and water absorption in rocks. 3. Operate electrical resistivity meter. 4. Describe the various types of maps. 5. Measure the attitude of beds and draw the sections for geological maps.	1. Identify the physical properties of minerals, rocks and various structural features like folds, faults and unconformities. 2. Calculate the specific gravity, porosity and water absorption in rocks, operate electrical resistivity meter and study of various types of maps. 3. Draw the sections pertaining to the formation geology of major dam sites of India. 4. Practise working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and present the results effectively

LIST OF EXPERIMENTS

1. Identification and description of physical properties of minerals.
2. Identification and description of geotechnical characteristics of rocks.
3. Determination of apparent specific gravity, porosity and water absorption of different rocks;
IS:1124 - 1974.
4. Study of structural models; folds, faults and unconformities.
5. Measurement of strike and dip of joints in granites using clinometer compass.
6. Measurement of electrical resistivity of rocks, soils and water.
7. Vertical electrical sounding.
8. Study of geological and geotechnical maps of Telangana, Andhra Pradesh and India.
9. Study of Topographic maps.
10. Study of maps and sections pertaining to the study of folds, faults and unconformities.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

CIVIL ENGINEERING DRAFTING LAB
SYLLABUS FOR B.E. III-SEMESTER

Instruction	:	2 period per Week	Semester End Exam	:	50	Subject Reference Code	:	PC341CE
Credits	:	1	Sessional Marks	:	25	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>Objectives of this course are to:</i>	<i>Upon the completion of this course students will be able to</i>
1. Develop skills to generate civil engineering drawings using AUTOCAD tools 2. Learn various tools and functions in AUTOCAD	1. Navigate the AutoCAD user interface 2. Apply the fundamental features of AutoCAD in a practical situation 3. Prepare civil engineering drawings in a detailed and visually impressive way 4. Streamline the planning process and become more productive with AutoCAD 5. Demonstrate professional behaviour in preparation of drawings

LIST OF EXPERIMENTS

- CAD:** Introduction to Computer Aided Drafting, Advantages and Disadvantages of CAD, List of CACED Softwares.
AUTOCAD: Introduction and Features of AUTOCAD Software.
- Environment of AutoCAD:** Workspace, Application Menu, Quick Access Toolbar, Ribbon, Search for information, Pull-down menu, Status bar, Function keys.
Coordinate systems: Used in AutoCAD - absolute and relative, Cartesian and polar coordinate systems.
- Basic Managing/ Display control Tools:** New, Save, Qnew, Open, Close, Quit/ Exit, Undo, Redo, Limits, Units, Zoom, Pan, Steering Wheel, View Cube etc.
Basic Drafting Tools: Line, Polylines, Point, Circle, Arc, Spline, Ellipse, Rectangle, Polygons, Text, Hatch.
- Editing/ Inquiry Tools:** Erase, oops, Move, Copy, Mirror, Rotate, Scale, Fillet, Chamfer, Trim, Extend, Break, Join, Stretch, Offset, Array, Distance, Radius, Angle, Area, Volume.
- Dimensioning Tools:** Linear, Aligned, Radius, Diameter, Centre, Angular, Baseline, Continuous, Ordinate, Arc Length, Jogged Radius Dimension, Dimension Space, Dimension Break, Inspection Dimension, Multileader and its Style.
- Layer Tools:** Concepts and use of Layers in AutoCAD drawing, Adding New layers, Editing and Managing Layers. List Properties, Use of Different Types of lines and their weightages.
Block/Wblock and Attributes: Concept and Significance of Blocks in AutoCAD Drawings, Creating Blocks, Editing and Managing Blocks
- Doors and Windows:** Plans, Sections and Elevations for different types of Doors and Windows.
- Stairs:** Details of Various Types of Staircases.
Footings: Sectional Elevations of RC footings for columns of Residential Buildings.
- Drawing of Plans, Elevations and Sections of various types of single storey Residential Buildings.
- Introduction to AUTOCAD 3D.

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING**

**MECHANICS OF MATERIALS LAB
SYLLABUS FOR B.E. III-SEMESTER**

Instruction	:	2 period per Week	Semester End Exam	:	50	Subject Reference Code	:	PC331CE
Credits	:	1	Sessional Marks	:	25	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Determine the properties of materials under the action of various loads. 2. Learn the ability to work in a team and make effective presentations.	1. Determine Young's Modulus of materials of beams by conducting deflection test. 2. Assess the quality of materials by conducting hardness test and impact test. 3. Learn the operation of universal testing machine (UTM). 4. Determining modulus of rigidity of materials by conducting torsion test and spring test. 5. Practice working as a team member and make effective presentations.

List of Experiments

1. Determination of Young's modulus by conducting Deflection test on Cantilever beam
2. Determination of Young's modulus by conducting Deflection test on Simply supported beam
3. Izod Impact test
4. Direct tension test on metal rods
5. Brinnell and Rockwell Hardness test
6. Compression test on brittle and ductile materials
7. Determination of modulus of rigidity by conducting tension test on a helical spring
8. Determination of modulus of rigidity by conducting compression test on a helical spring
9. Determination of modulus of rigidity by conducting torsion test
10. Determination of modulus of elasticity by conducting deflection test on fixed beam
11. Determination of modulus of elasticity by conducting deflection test on continuous beam
12. Bend test on metal rod

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

MECHANICS FOR ENGINEERS
(Civil, Mech., & EEE)

SYLLABUS FOR BRIDGE COURSE B.E. III-SEMESTER

Instruction	: 2 periods per Week	Semester End Exam	: 70	Subject Reference Code	: -
Credits	: -	Sessional Marks	: 30	Duration of Sem. End Exam	: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. To learn the resolution of a system of spatial forces. 2. To assess the frictional forces on rigid body. 3. To understand the concepts of dynamics and its principles. 4. To explain kinetics and kinematics of particles, projectiles, curvilinear motion and centroidal motion. 5. To impart the concepts of work-energy method and its applications to rectilinear translation, centroidal motion.	1. Judge whether the body under the action of spatial force system. 2. Solve problem of bodies subjected to friction. 3. Distinguish between statics and dynamics and differentiate between kinematics and kinetics. 4. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion. 5. Know the concepts of work and energy principles subject and derive the work energy equations for translation, rotation and connected systems.

UNIT-I

Force Systems: Components of forces, moments in space and its applications.

UNIT-II

Friction: Laws of friction, application to simple systems and wedge friction.

UNIT-III

Kinematics: Rectilinear motion, curvilinear motion, velocity and acceleration of a particle.

UNIT-IV

Kinetics: Analysis as a particle, analysis as a rigid body in translation, fixed axis rotation and rolling bodies.

UNIT-V

Work Energy: Principles of work energy and its application to translation, particle motion and connected systems.

Suggested Books:

1. Singer F.L., "Engineering Mechanics", Harpper & Collins, Singapore, 1994.
2. Timoshenko S.P. and Young D.H., "Engineering Mechanics", McGraw Hill International Edition, 2014.
3. Andrew Pytel, Jaan Kiusalaas., "Engineering Mechanics", Cengage Learning, 2014.

References Books

1. Beer F.P. and Johnston E.R., "Jr. Vector Mechanics for Engineers", TMH, 2004.
2. Hibbeler R.C. & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
3. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
4. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2008.
5. Meriam. J. L., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2008.

Online Resources:

1. NPTEL Course (www.nptel.ac.in)
2. Virtual labs (www.vlab.co.in)

**SYLLABUS FOR
BE IV-SEMESTER
(CBCS)**

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

ENVIRONMENTAL SCIENCE
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	2 period per Week	Semester End Exam	:	70	Subject Reference Code	:	MC320CE
Credits	:	2	Sessional Marks	:	30	Duration of Sem. End Exam	:	2 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
<ol style="list-style-type: none"> Describe various types of natural resources available on the earth surface. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity. Explain the causes, effects and control measures of various types of environmental pollutions. Describe the methods for water conservation, the causes, effects of global warming, climate change, acid rain, ozone layer depletion, various types of disasters and their mitigation measures. 	<ol style="list-style-type: none"> Describe the various types of natural resources. Differentiate between various biotic and abiotic components of ecosystem. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India. Illustrate causes, effects, control measures of various types of environmental pollutions. Explain the methods of water conservation, causes, effects of climate change, global warming, acid rain and ozone layer depletion, various types of disasters and their mitigation measures.

UNIT-I

Environmental Studies: Definition, importance of environmental studies. Natural resources: Water resources; floods, drought, conflicts over water, dams-benefits and problems. Food resources; Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources: Renewable and non-renewable energy resources. Land Resources, soil erosion and desertification.

UNIT-II

Ecosystems: Structure and function of an ecosystem, producers, consumers and decomposers, food chains, food webs, ecological pyramids, aquatic ecosystem (ponds, oceans, estuaries).

UNIT-III

Biodiversity: Genetic species and ecosystem diversity. Values of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

UNIT-IV

Environmental Pollution: Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste & e-waste management.

UNIT-V

Social Aspects and the Environment: Water conservation, Climate change, global warming, acid rain, ozone layer depletion. Environmental Impact Assessment, population explosion.

Suggested Books:

- Deswal S. and Deswal A., A Basic Course on Environmental studies, Dhanpat Rai & Co Pvt. Ltd. 2013.
- Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2006.
- Suresh K. Dhameja, Environmental Studies, S.K. Kataria & Sons, 2010.

References Books:

- De A.K., Environmental Chemistry, New Age International, 2003.
- Odum E.P., Fundamentals of Ecology, W.B. Saunders Co., USA, 2004.
- Sharma V.K., Disaster Management, National Centre for Disaster Management, IPE, Delhi, 2013.
- Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2013.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
STRENGTH OF MATERIALS – II
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	3+1 period per Week	Semester End Exam	:	70	Subject Reference Code	:	PC410CE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will be able to</i>	<i>Upon the completion of this course students will be able to</i>
1. Examine and interpret the deflection of simply supported, cantilever and overhanging beams 2. Analyze propped cantilevers, fixed and continuous beams for deflection, shear and bending moment 3. Locate shear centre and draw shear flow in simple sections. 4. Analyze torsion of circular shafts and analyse helical and bending springs and examine the concept of strain energy 5. Investigate the behaviour of columns and struts.	1. Express understanding of methods of double integration, conjugate beam and Mohr's theorems to solve problems of deflection of beams and construct shear force and bending moment diagrams 2. Determine shear centre for simple sections. 3. Compute the torsional shear stress across the cross section of circular shafts. 4. Compute stresses in helical springs and compute strain energy in bars subjected to axial and flexural deformation 5. Compute the axial and bending stresses in columns using various formulae

UNIT-I

Deflections: Slope and deflection by the double integration method for cantilever and simply supported beams, and beams with overhangs carrying point loads, uniformly distributed and varying load over entire span. Moment area and conjugate beam methods for single beams having different moment of inertia

UNIT-II

Propped Cantilevers: Cantilever beams on elastic and rigid props for point loads and uniformly distributed loads. Bending moment and shear force diagrams, and deflections.

Fixed Beams: Determination of shear force, bending moment, slope and deflection in fixed beams with and without sinking of supports for point loads, uniformly distributed loads, and uniformly varying load over entire span. SFD, BMD - Elastic curve.

UNIT-III

Continuous Beams: Determination of moments in continuous beams with and without sinking of supports by the theorem of three-moments; bending moment and shear force diagrams. Elastic curve.

Shear Centre: Concept and importance of shear centre shear flow and determination of shear centre of simple sections such as T sections and Channel sections with one axis of symmetry.

UNIT-IV

Torsion: Theory of torsion in solid and hollow circular shafts; shear stress, angle of twist, strength and stiffness of shafts. Transmission of power. Combined torsion and bending with and without end thrust. Determination of principal stresses and maximum shear stress. Equivalent Bending Moment and Twisting Moment.

Springs: Close and open coiled helical springs under axial load and axial twist.

UNIT-V

Strain Energy: Strain energy of resilience in determinate bars subjected to gradually applied loads and impact loads. Resilience of beams. Castigliano's theorem and its applications to beams. Theorem of reciprocal deflections.

Columns and struts: Euler's theory. Rankine – Gordon's formula, straight-line formula, effect of end conditions, slenderness ratio, eccentrically loaded columns, and Secant and Perry's formulae.

Suggested Books:

1. Ramamrutham S., Narayanan R., "Strength of Materials", Dhanpat Rai Publishing Company, New Delhi, 2011.
2. Bansal R.K., A text book of "Strength of Materials", Laxmi Publications, New Delhi, 2010.
3. Rajput R.K., "Strength of Materials" S.Chand Publications, New Delhi, 2006.

References Books:

1. Junnarkar S.B., "Mechanics of Structures" (Vol-I & II), Charotar Publishing House, Anand, 2002.
2. Pytel and Singer F.L., "Strength of Materials", Harper & Row, New York, 1998.
3. Subramanian R., "Strength of Materials", Oxford University Press, 2010.
4. Ferdinand P. Beer, E. Russell Johnston Jr, John T. Dewolf, David F. Mazurek, "Mechanics of Materials", 2016.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

SURVEYING-II
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	3 period per Week	Semester End Exam	:	70	Subject Reference Code	:	PC420CE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Understand basic surveying operations and computations using theodolite for various applications in field such as determination of elevations and setting of various curves 2. Learn tacheometry and hydrographic surveying 3. Study the modern techniques in surveying with GPS, aerial photogrammetry, remote sensing, GIS.	1. Employ the methods to handle different cases to determine the elevations of various points using concepts of trigonometrical levelling and apply the corrections such as curvature, refraction and axis signal in geodetic observations 2. Compute the parameters required for setting out simple circular curve, reverse curve, compound curves and introduce the concepts of transition curves and vertical curves. 3. Report the various methods and capabilities of tacheometric surveying and hydrographic surveying 4. Apply the concepts of modern tools such as GPS and aerial photogrammetry 5. Understand the concepts of Remote sensing and GIS and apply them in civil engineering problems

UNIT-I

Trigonometric leveling and Geodetic observations: Trigonometrical levelling, calculation of elevations and distances of accessible and inaccessible objects, Problems. Geodetic observations, Refraction and curvature corrections, axis signal correction, determination of difference in elevation by single and reciprocal observations, problems.

UNIT-II

Curves: Theory of simple curves. Setting out simple curves by linear and angular methods. Compound curves – Elements – Solution to different cases. Reverse curves – Parallel straights and Non parallel straights. Introduction to transition curves and vertical curves.

UNIT-III

Tacheometry: Fixed and movable hair tacheometers. Principle of stadia method, distance and elevation formula for staff held vertical and normal, instrumental constants, Anallactic lens, tangential method, use of subtense bar.

Hydrographic Survey: Brief introduction, Equipment used in hydrographic survey, methods and applications.

UNIT-IV

Global Positioning System (GPS): Overview of GPS, Functional system of GPS – Space segment, control segment and user segment, working principle of GPS/DGPS, Errors in GPS

Introduction to photogrammetry: Basic definitions, scale of vertical photograph, Displacements and errors in aerial photogrammetry

UNIT-V

Remote Sensing: Definition, Elements of remote sensing, Electromagnetic spectrum and radiation, concept of spectral reflectance, Types of remote sensing, Remote sensing satellites, sensor resolutions, and applications to Civil Engineering.

Geographic Information Systems (GIS): Definition, components of GIS, Functions and advantages of GIS, applications to Civil Engineering

Suggested Books:

1. Punmia B.C., Ashok Kumar Jain, Arun Kumar Jain, Surveying, Vol. 1 and 2, Laxmi Publications, 2005.
2. Duggal S.K., Surveying-II, Mc Graw Hill, 2013.
3. Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, 2011.

References Books:

1. Subramanian R., Surveying and Levelling, Oxford University Press, 2014.
2. Venkatramaiah C., A Text Book of Surveying, Universities Press, Hyderabad, 2011.
3. David Clark, Plane and Geodetic Surveying for Engineers, Higher Surveying Vol. 2, CBS Publishers and Distributors Pvt Ltd, 2004.
4. Arora K.R., Surveying, Vol.1 and 2, Standard Publishers Distributors, 2010.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

FLUID MECHANICS-I
SYLLABUS FOR B.E. IV- SEMESTER

Instruction	:	3 period per Week	Semester End Exam	:	70	Subject Reference Code	:	PC430CE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Learn the properties of fluids 2. Apply the laws of conservation of mass, energy and momentum for fluid flow. 3. Assess the phenomenon of flow in pipes and study concepts of dimensional analysis and model studies.	1. Compute properties of fluid and discuss about fluid statics 2. Understand various aspects of Fluid kinematics 3. Formulate equations based on conservation of mass, energy and momentum. Analyse forces on nozzles and describe devices use for discharge. 4. Compute Reynolds number, formulate equations for laminar and turbulent flow through pipes and water hammer in pipes. 5. Discuss and solve problems on compressible flow and dimensional analysis and model studies.

UNIT-I

Fluid Properties: Definition of fluid, properties of fluids, density, specific weight, specific volume, specific gravity, bulk modulus, vapour pressure, viscosity. Newton's law of viscosity and its applications. Capillarity and surface tension.

Measurement of Pressure: Piezometer and U tube Manometers. Bourdon Gauge. Absolute pressure and Gauge pressure.

Hydro Statics: Pascal law, buoyancy, metacentre and metacentric Height, Total pressure and centre pressure on Horizontal plane and vertical plane surfaces.

UNIT-II

Fluid Kinematics: Classification of fluid flow; steady, unsteady, uniform, non-uniform, one, two and three-dimensional flows, Rotational and irrotational flows. Concepts of streamline, stream tube, path line and streak line. Law of mass conservation. Continuity equation from control volume and system analysis. Stream function, and velocity potential function. Convective and local acceleration, flow net and its uses.

UNIT - III

Fluid Dynamics: Body forces and surface forces. Euler's equation of motion in three dimensions.

Law of Energy Conservation: Bernoulli's equation from integration of Euler's equation. Significance of the Bernoulli's equation, limitations, modifications and application to real fluid flows, venturi meter and orifice meter.

Impulse Momentum Equation: Application of the impulse momentum equation to evaluate forces on nozzles and bends. Vortex flow; forced and free vortex.

Measure of Discharge in Free Surface Flows: Notches and weirs.

UNIT-IV

Flow through Pressure Conduits: Reynold's experiment and its significance. Upper and lower critical Reynold's Numbers. Critical velocity, Hydraulic gradient and Energy gradient line. Laminar flow through circular pipes. Hagen - Poiseuille equation. Characteristics of turbulent flow. Head loss in pipes. Darcy - Weisbach equation. Friction factor. Moody's diagram. Minor losses. Pipes in series and pipes in parallel. Unsteady flow in pipes: Water hammer phenomenon, pressure rise due to gradual and sudden valve closure.

UNIT-V

Dimensional Analysis and Model Studies: Dimensional analysis as a tool in experimental hydraulics, Buckingham's pi-theorem, applications, geometric, Kinematics and dynamic similarity, similarity laws; significance of Reynold's, Froude and Mach Numbers, different types of models and their scale ratios.

Suggested Books:

1. Modi P.N. and Seth S.M., Hydraulics and Fluid Mechanics including Hydraulics Machines, Standard Book House, Delhi, 2015.
2. Bansal R.K., Fluid Mechanics and Hydraulic Machines, Laxmi Publications, 2010.

References Books:

1. Ojha C.S.P., Berndtsson R., Chandramouli P.N., Fluid Mechanics and Machinery, Oxford University Press, 2012.
2. Rajput R.K., Fluid Mechanics and Hydraulic Machines, S. Chand & Co., 2013.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

BUILDING MATERIALS AND CONSTRUCTION
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	3 period per Week	Semester End Exam	:	70	Subject Reference Code	:	ES410CE
Credits	:	3	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
3. Acquire knowledge on building materials such as stones, bricks, cement, aggregates, mortar and concrete. 4. Study various aspects of paints, varnishes and timber. 5. Learn the construction principles of floors, and different types of flooring	4. Explain the characteristics of stones and bricks. 5. Describe the properties and tests on cement, aggregate, concrete, mortar. 6. Understand the significance of emerging building materials. 7. Identify the suitability of timber, paints and varnishes for building works. 8. Review the construction principles of floors.

UNIT-I

Stones: Classifications of stones, uses of stones as building materials, characteristics of good building stones. Quarrying, various methods. Dressing and polishing of stones.

Bricks: Composition of brick clay. Methods of manufacturing bricks. Preparation of brick earth, Tempering, Pugmill. Various steps of moulding, drying and methods of burning of bricks; clamps. Characteristics of good building bricks, classification of bricks. Introduction to light weight bricks.

UNIT-II

Cement: Chemical composition of cement, manufacturing process. Tests on cement. IS:269 specifications for Ordinary Portland Cement, various types of cements.

Blended Cements: Various types and their uses.

Fine Aggregate: Characteristics of good sand and its classifications, bulking of sand. Alternatives to natural sand.

Coarse Aggregate: Characteristics of good coarse aggregates for manufacture of concrete. Tests on aggregates.

UNIT-III

Mortar: Different types of mortars, preparation, setting and curing. Manufacturing methods of mortar.

Concrete: Designation, workability of concrete in fresh state.

Reinforcing steel: Types of reinforcement, specifications

UNIT-IV

Timber: Timber as a building material and its uses. Various types of timber. Seasoning and its importance. Preservation of wood. Plywood & Laminates and their uses.

Paints : Constituents, characteristics of good paints, varnishes.

UNIT-V

Floors: Characteristics of good floors. Common types of floors. Stone flooring, concrete flooring, terrazo flooring. Ceramic and mosaic tiles. Industrial floors. Methods of construction, and maintenance.

Suggested Books:

1. Arora S.P. and Bindra S.P., A Text Book of Building Construction, Dhanpat Rai & Sons Publications, 2013.
2. Gambhir M.L., Neha Jamwal, Building Materials: Products, Properties and Systems, McGraw Hill Education (India) Private Limited, 2011.
3. Sushil Kumar, Building Construction, Standard Publishers, 2006.

References Books:

1. Varghese P.C., Building Materials, PHI Learning Pvt. Ltd., Delhi, 2015.
2. National Building Code of India, 2005.
3. Advances in Building Materials and Construction, Central Building Research Institute, Roorkee, 2004.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

Open Elective-II (to other Branches)
GREEN BUILDINGS
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	1 period per Week	Semester End Exam	:	50	Subject Reference Code	:	OE4XXCE
Credits	:	1	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>Objectives of this course are to:</i>	<i>Upon the completion of this course the students will be expected to:</i>
1. Learn the principles of planning and orientation of buildings. 2. Acquire knowledge on various aspects of green buildings	1. Explain the principles of building planning, its bylaws and provide facilities for rainwater harvesting 2. Understand the concepts of green buildings

UNIT-I

Planning of building: Principles of planning, Relevant building bylaws, site selection for buildings, orientation of buildings, common errors in planning, Provision of rain water harvesting

UNIT-II

Green Building Technologies: Introduction- Necessity - Concept of Green building. Principles of green building – Selection of site and Orientation of the building – usage of low energy materials – effective cooling and heating systems – effective electrical systems – effective water conservation systems - Certification systems- Green Rating for Integrated Habitat Assessment (GRIHA) and Leadership in Energy and Environmental Design (LEED), case studies

Suggested Books:

1. Shahane, V. S, “Planning and Designing Building”, Poona, Allies Book Stall, 2004.
2. Michael Bauer, Peter Möslle and Michael Schwarz “Green Building – Guidebook for Sustainable Architecture” Springer, 2010.
3. Tom Woolley, Sam Kimmins, Paul Harrison and Rob Harrison “Green Building Handbook” Volume I, Spon Press, 2001.

References Books:

1. Mili Majumdar, “Energy-efficient buildings in India” Tata Energy Research Institute, 2002.
2. TERI “Sustainable Building Design Manual- Volume I & II” Tata Energy Research Institute, 2009.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

Open Elective-III (to other Branches)
DISASTER MANAGEMENT
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	2 period per Week	Semester End Exam	:	70	Subject Reference Code	:	OE4XXCE
Credits	:	2	Sessional Marks	:	30	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>Objectives of this course are to:</i>	<i>Upon the completion of this course the students will be expected to:</i>
1. Know about the state of art of disaster management in world and explore the history of the disasters and comprehend how past events have helped shape the future. 2. Study the various natural and manmade disasters and apply the mitigation measures 3. Expose students to various technologies used for disaster mitigation and management.	1. Attain knowledge on various types, stages, phases in disaster with international & national policies and programmes with reference to the disaster reduction. 2. Understand various types of natural disaster, their occurrence, Effects, Mitigation and Management Systems in India 3. Understand different types of manmade disasters, their occurrence, Effects, Mitigation and Management Systems in India. 4. Explain the utility of geography information systems (GIS), Remote sensing technology in all phases of disaster mitigation and management.

UNIT-I

Introduction – Hazard, vulnerability and risk, Types of disasters , Disaster management cycle, Progress of disaster management in world, vulnerability profile of India, Disaster management act, Disaster management in India

UNIT-II

Natural Disasters – Hydro- meteorological based disasters – Tropical cyclones, floods, drought and desertification zones, Geographical based disasters – Earthquake, Tsunamis, Landslides and avalanches – Causes, Types, effects and Mitigation measures.

Human induced hazards – chemical industrial hazards, major power breakdowns, traffic accidents, etc.

UNIT-III

Role of Remote Sensing and Geographical Information Systems (GIS) in Disaster Management: Introduction to remote sensing and GIS, its applications in disaster management.

Suggested Books:

1. Rajib, S and Krishna Murthy, R.R.(2012) “Disaster Management Global Challenges and Local Solutions”, Universities Press, Hyderabad, 2012.
2. Navele, P & Raja, C.K. (2009), Earth and Atmospheric Disasters Management, Natural and Manmade, B.S. Publications, Hyderabad, 2009.
3. Battacharya, T. Disaster Science and Management, Tata McGraw Hill Company, New Delhi, 2012.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
STRENGTH OF MATERIALS LAB
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	2 period per Week	Semester End Exam	:	50	Subject Reference Code	:	PC441CE
Credits	:	1	Sessional Marks	:	25	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>Objectives of this course are to:</i>	<i>Upon the completion of this course students will be able to</i>
1. Determine the properties of materials under the action of various loads.	1. Determine Young's Modulus of materials of beams by conducting deflection tests. 2. Assess the properties of materials by conducting hardness test, impact test, tension test and compression test. 3. Determine modulus of rigidity of materials by conducting torsion test and tests on springs. 4. Practise working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively

List of Experiments

1. Determination of Young's modulus by conducting Deflection test on Cantilever beam
2. Determination of Young's modulus by conducting Deflection test on Simply supported beam
3. Izod Impact test
4. Direct tension test on metal rods
5. Brinnell and Rockwell Hardness test
6. Compression test on brittle and ductile materials
7. Determination of modulus of rigidity by conducting tension test on a helical spring
8. Determination of modulus of rigidity by conducting compression test
9. Determination of modulus of rigidity by conducting torsion test
10. Determination of modulus of elasticity by conducting deflection test on fixed beam
11. Determination of modulus of elasticity by conducting deflection test on continuous beam
12. Bend test on metal rod

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

SURVEYING-II LAB
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	2 period per Week	Semester End Exam	:	50	Subject Reference Code	:	PC451CE
Credits	:	1	Sessional Marks	:	25	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>Objectives of this course are to:</i>	<i>Upon the completion of this course students will be able to</i>
1. Apply classroom knowledge in laboratory exercises and handling of Theodolite, GPS and Total station.	1. Determine the RL of a given point in different practical situations 2. Apply the principles of tacheometry in the field 3. Locate the ground features using GPS 4. Practice working as a team member and make effective presentations. 5. Demonstrate professional behaviour in conducting the experiments and present the results effectively

List of Experiments

1. Measurement of vertical angles; application to simple problems of height and distance using angle of elevation and depression.
2. Reduced Level (RL) of a given point using two instrument-stations in the same vertical plane as that of the point when the base of the point is inaccessible.
3. Difference in levels between two given points using two theodolite stations (baseline) in different planes.
4. Tacheometric survey; determination of constants for both the cases when the line of sight is horizontal and inclined.
5. Finding the gradient of a line connecting two points using Tangential tacheometry and Stadia tacheometry.
6. Traversing and area calculation using Total Station - Plotting.
7. Plotting of simple curve using linear method.
8. Plotting of simple curve using angular method with theodolite and total station.
9. Profile leveling using Total station- Plotting Longitudinal section and Transverse sections
10. Location of ground features using Global Positioning System (GPS) instrument and plotting the same after processing the data

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING

FLUID MECHANICS LAB
SYLLABUS FOR B.E. IV-SEMESTER

Instruction	:	2 periods per Week	Semester End Exam	:	50	Subject Reference Code	:	PC461CE
Credits	:	1	Sessional Marks	:	25	Duration of Sem. End Exam	:	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
1. Provide practical knowledge in verification of principles of fluid flow 2. Impart knowledge in measuring coefficient of discharge for various devices.	1. Determine coefficient of discharge for various measuring devices such as orifice, venturimeter, mouth piece, notches, weirs and hemi-spherical vessel and Validate Bernoulli's theorem.. 2. Calculate Reynold's number and classify types of flows. 3. Estimate Darcy's friction factor for turbulent flow in pipes . 4. Practise working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively

List of Experiments

1. Determination of C_d , C_v and C_c for Circular Orifice
2. Determination of C_d for Mouthpiece
3. Determination of C_d for V-notch
4. Determination of C_d for Rectangular notch
5. Determination of C_d for Venturimeter
6. Determination of C_d for Hemi-Circular vessel
7. Determination of types of flows using Reynold's Apparatus
8. Determination of Darcy's coefficient of friction.
9. Verification of Bernoulli's Theorem.
10. Determination of C_d for Orifice Meter
11. Determination of coefficient of sudden contraction (minor losses)