

**VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)
Ibrahimbagh, Hyderabad-31**

Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

**Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad**



**SYLLABUS BOOK FOR
SECOND YEAR B.E (CIVIL)
UNDER CBCS WITH EFFECT FROM 2017 – 2018
(For the students admitted in 2016-17)**



**DEPARTMENT OF CIVIL ENGINEERING
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DEPARTMENT MISSION

To dedicate ourselves to strive and impart in-depth knowledge of Civil Engineering and prepare the students to meet the challenges of growing construction activity with confidence and

DEPARTMENT VISION

“To strive for excellence in order to make the students better citizens with technical knowledge and social awareness.”

VASAVICOLLEGE OF ENGINEERING (AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION FOR B.E. III-SEMESTER w.e.f. 2017-18

| Course Code | III - SEMESTER | | | | | | | | Credits |
|-------------|---|---|---|---|---|-----------------------|------------|-----|---------|
| | Course Name | Scheme of Instruction (Hours per week) | | | | Scheme of Examination | | | |
| | | L | T | D | P | Duration | Max. Marks | | |
| | THEORY | | | | | Hours | SEE | CIE | |
| BS310MA | Engineering Mathematics – III | 3 | 1 | 0 | 0 | 3 | 70 | 30 | 3 |
| ES310CE | Building Planning & Drawing | 2 | 0 | 2 | 0 | 3 | 70 | 30 | 2 |
| PC310CE | Strength of Materials-I | 3 | 1 | 0 | 0 | 3 | 70 | 30 | 3 |
| PC320CE | Surveying-I | 3 | 0 | 0 | 0 | 3 | 70 | 30 | 3 |
| BS320CE | Geology | 3 | 0 | 0 | 0 | 3 | 70 | 30 | 3 |
| HS310EH | FS-I: Communication Skills in English-I | 2 | 2 | 0 | 0 | 3 | 70 | 30 | 2 |
| MC310ME | Introduction to Entrepreneurship | 1 | 0 | 0 | 0 | 2 | 35 | 15 | 1 |
| OE3XXXX | Open Elective – I | 2 | 0 | 0 | 0 | 3 | 70 | 30 | 2 |
| MC300EH | Human Values & Professional Ethics-I | 1 | 0 | 0 | 0 | 2 | 35 | 15 | 1 |
| LABS | | | | | | | | | |
| PC331CE | Surveying-I Lab | 0 | 0 | 0 | 2 | 3 | 50 | 25 | 1 |
| BS321CE | Geology Lab | 0 | 0 | 0 | 2 | 3 | 50 | 25 | 1 |
| PC341CE | Civil Engineering Drafting Lab | 0 | 0 | 0 | 2 | 3 | 50 | 25 | 1 |
| Total | | 20 | 4 | 2 | 6 | | 710 | 315 | 23 |
| Grand Total | | 32 | | | | | 1025 | | |

INTER DISCIPLINARY COURSES OFFERED BY CIVIL TO MECHANICAL ENGINEERING

| | | | | | | | | | |
|---------|----------------------------|---|---|---|---|---|----|----|---|
| ES330CE | Mechanics of Materials | 3 | 0 | 0 | 0 | 3 | 70 | 30 | 3 |
| ES331CE | Mechanics of Materials Lab | 0 | 0 | 0 | 2 | 3 | 50 | 25 | 1 |

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

| | | |
|--------------------------|---------------|------------------------|
| Instruction:3+1Hrs/ Week | SEE Marks: 70 | Course Code:BS310MA |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 3 Hrs |

| COURSE OBJECTIVES | COURSE OUTCOMES |
|---|--|
| <i>The course will enable the students to:</i> | <i>At the end of the course students will be able to:</i> |
| <ol style="list-style-type: none"> 1. Study the Fourier series, conditions for expansion of function and half range series 2. Formulate and solve linear and nonlinear partial differential equations and apply partial differential equations to engineering problems viz., wave, heat and Laplace's equations. 3. Study the methods to solve equations, apply numerical methods to interpolate, differentiate and integrate functions and to solve differential equations using numerical methods and solve systems of equations. 4. Understand Random variables Probability Distributions, Statistics and their applications. 5. Understand how to fit a curve to a given data, how Correlation between variables can be measured. | <ol style="list-style-type: none"> A. Expand any function which is continuous, discontinuous, even or odd in terms of its Fourier series. B. Find the Partial differential equations by eliminating arbitrary constants and functions and solve linear, non linear Partial differential equations and also will be able solve wave, heat and Laplace's equations in engineering problems . C. Solve algebraic and transcendental equations using Bisection method Regula-Falsi, Newton-Raphson, apply numerical methods to interpolate, differentiate functions, solve systems of equations and solve differential equations using numerical methods. D. Apply various probability distributions to solve practical problems, to estimate unknown parameters of populations and apply the tests of hypotheses. E. Solve problems on how fitting of a curve to given data using curve fitting, and also to find co-efficient of correlation and to determine regression lines and their applications. |

UNIT –I (8 classes)

Fourier Series: Introduction to Fourier series –Dirichlet's Conditions- Euler's Formula – Functions of 2π interval – Change of Interval - Fourier series expansions of even and odd functions - Fourier Expansion of Half-range Sine and Cosine series.

UNIT –II (15 classes)

Partial Differential Equations and its Applications: Formation of first and second order Partial Differential Equations - Solution of First Order Equations – Linear Equation - Lagrange’s Equation, Non-linear first order equations - Charpit’s method

Applications of Partial Differential Equations: Method of Separation of Variables - Solution of One Dimensional Heat Equation - One Dimensional Wave Equation – Steady State Two Dimensional Heat Equation.

UNIT-III (15 classes)

Numerical Methods: Interpolation- Newton’s Forward and Backward Interpolation Formulae - Lagrange’s Interpolation Formula - Newton’s Divided Difference Formula - Numerical Differentiation -Interpolation approach- Numerical Solutions of Ordinary Differential Equations - Runge - Kutta Method of 4th order(without proofs).

UNIT-IV (6 classes)

Curve Fitting: Curve fitting by the Method of Least Squares - Fitting of Straight line – Regression - Lines of Regression - Correlation – Karl Pearson’s Co-efficient of Correlation.

UNIT-V (12 classes)

Probability and Statistics: Random Variables - Probability Distribution function for Discrete and Continuous Random variables - Expectation – Variance – Moments -Moment Generating Function-Normal Distributions – Testing of Hypothesis - Tests of Significance - t-test - F- test, χ^2 - test for small samples.

Suggested Books:

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.

Reference Books:

1. Advanced Engineering Mathematics, Kreyszig E, 8th Edition, John Wiley & Sons Ltd, 2006.
2. A text book of Engineering Mathematics by N.P.Bali& Manish Goyal, Laxmi Publication.
3. Numerical Analysis by S.S.Sastry –PHI Learning Ltd.,
4. Fundamentals of Mathematical Statistics, Gupta & Kapoor, Sultan chand& sons, New Delhi.

Online Resources:

1. <http://www.mathsworld.wolfram.com/topics>
2. <http://www.nptel.ac.in/course.php>

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
BUILDING PLANNING AND DRAWING
SYLLABUS FOR B.E. III-SEMESTER

| | | |
|---------------------------|---------------|------------------------|
| Instruction:2+2 Hrs/ Week | SEE Marks: 70 | Course Code:ES310CE |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 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+1Hrs/ Week | SEE Marks: 70 | Course Code:PC310CE |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">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 beams4. Define and analyze problem of columns subjected to direct and bending stresses5. Define the concepts of compound stresses and strains in beams and also Investigate the behaviour of thin cylinder, spherical shells and thick cylinders | <ol style="list-style-type: none">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 strains5. 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: 3Hrs/ Week | SEE Marks: 70 | Course Code: PC320CE |
| Credits: 3 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">1. Learn the basic concepts and use of surveying in Civil Engineering2. 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 data3. Acquire knowledge on use of theodolite and total station equipment, its adjustments, measurements, methods employed, errors and computation of data. | <ol style="list-style-type: none">1. Employ basic surveying operations and computations using chain/tape and compass2. 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 data5. 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 multilevel 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 VidyarthiGruhaPrakshan, 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:3Hrs/ Week | SEE Marks: 70 | Course Code:BS320CE |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">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. | <ol style="list-style-type: none">1. Identify the different minerals and distinguishing features exhibited by the rocks2. 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 landslides 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. SubinoyGangopadhyay, Engineering Geology, Oxford University Press, 2013.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
FS-I: COMMUNICATION SKILLS IN ENGLISH-I
SYLLABUS FOR B.E. III-SEMESTER

| | | |
|--------------------------|---------------|------------------------|
| Instruction:2+2Hrs/ Week | SEE Marks: 70 | Course Code: HS310EH |
| Credits:2 | CIE Marks: 30 | Duration of SEE: 3 Hrs |

| Course Objective | Course Outcome |
|--|---|
| <ul style="list-style-type: none">• The four major skills of language learning, listening, speaking, reading and writing provide the right key to success.• The main objective of this finishing school curriculum is to involve content for all the above mentioned four skills in teaching English and to get students proficient in both receptive and productive skills | <ol style="list-style-type: none">1. Respond to questions and Engage in an informal conversation.2. Narrate a message/story/incident, both verbally and in writing.3. Describe an event/a session/ a movie/ an article.4. Respond to others while being in a casual dialogue.5. comprehend facts given and respond in an appropriate manner.6. Construct sentences in a coherent form7. Provide explanations8. Recognize and list the key points in a topic/message/article.9. Participate in group and forum discussions by providing factual information, possible solutions, and examples.10. Debate on a topic by picking up the key points from the arguments placed.11. Provide logical conclusions to the topics under discussion.12. Prepare, present, and analyze reports |

UNIT I – FUNDAMENTALS OF COMMUNICATION

Competencies:

- Basic conversational ability.
- Write e-mails introducing themselves & their purpose

Topics covered

Greeting and Introductions

Small Talk

Recalling

Topic Level Details

Greeting & Introductions

Competencies:

- Greeting appropriately
- Introducing themselves, a friend
- Responding to simple statements and questions both verbally and in writing
- Seeking introduction from others about themselves or about any topic.
- Writing an email with appropriate salutation, subject lines, self-introduction, and purpose of mail.

Small Talk**Competencies:**

- Identifying the topic of conversation.
- Speaking a few sentences on a random list of topics
- Reading simple information like weather reports, advertisements
- Seeking clarifications.

Recalling**Competencies:**

- State takeaways from a session or conversations

UNIT II :NARRATIONS AND DIALOGUES**Competencies:**

- Framing proper phrases and sentences to describe in context
- Speaking fluently with clarity and discrimination
- Responding to others in the dialogue.

Topics covered

Paraphrasing

Describing

Topic Level Details**Paraphrasing****Competencies:**

- Listen for main ideas and reformulating information in his/her own words
- Draw appropriate conclusions post reading a passage.
- Writing an email confirming his/her understanding about a topic

Describing**Competencies:**

- Speaking, Reading, and Writing descriptive sentences and paragraphs.

UNIT-III:RATIONAL RECAP

Competencies:

- Organizing and structuring the communication
- Detailing a topic
- Summarizing a topic.

Topics Covered:

Organizing

Sequencing

Explaining

Summarizing

Topic Level Details

Organizing

Competencies:

- Organizing the communication based on the context and audience

Sequencing

Competencies:

- Structuring the content based on the type of information.

Explaining

Competencies:

- Explaining a technical/general topic in detail.
- Write an email giving detailed explanation/process

Summarizing

Competencies:

- Recapitulating

UNIT-IV: PROFESSIONAL DISCUSSIONS AND DEBATES

Competencies:

- Analytical and Probing Skills
- Interpersonal Skills

Topics Covered:

Discussing

Debating

Topic Level Details

Discussing

Competencies:

- Thinking
- Assimilating

Debating

Competencies:

- Comprehending key points of the debate and note decisive points

including supporting details.

- Construct a logical chain of arguments and decisive points.
- Writing a review about a product by providing reasons, causes, and effects

UNIT -V: DRAWING CONCLUSIONS AND REPORTING

Competencies:

- Reasoning skills - Coherent and logical thinking
- Reporting and Analyzing skills.

Topics Covered:

Concluding

Reporting

Topic Level Details

Concluding

Competencies:

- Analyzing the points discussed.
- Connecting all points without gaps.
- Identifying clinchers.
- Communicating the decisions

Reporting

Competencies:

- Reporting an incident
- Writing/Presenting a project report

DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR BE III SEMESTER
INTRODUCTION TO ENTREPRENEURSHIP

| | | |
|-----------------------|---------------|-----------------------|
| Instruction:1Hr/ Week | SEE Marks:35 | Course Code: MC310ME |
| Credits:1 | CIE Marks: 15 | Duration of SEE:2 Hrs |

| 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:

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
MECHANICS OF MATERIALS
SYLLABUS FOR B.E. III-SEMESTER

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|------------------------|---------------|------------------------|
| Instruction:3Hrs/ Week | SEE Marks: 70 | Course Code:ES330CE |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">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 beams4. 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 examples5. Investigate the behaviour of thin and thick cylinders subjected to internal and external pressure and apply the concepts to the solution of example problems | <ol style="list-style-type: none">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 coefficients5. 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 Hrs/ Week | SEE Marks:50 | Course Code:PC331CE |
| Credits:1 | CIE Marks: 25 | Duration of SEE: 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: 2Hrs/ Week | SEE Marks: 50 | Course Code: BS321CE |
| Credits: 01 | CIE Marks: 25 | Duration of SEE: 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> |
| <ol style="list-style-type: none">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. | <ol style="list-style-type: none">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 team5. 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:2Hrs/ Week | SEE Marks:50 | Course Code:PC341CE |
| Credits:01 | CIE Marks: 25 | Duration of SEE: 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> |
| <ol style="list-style-type: none">1. Develop skills to generate civil engineering drawings using AUTOCAD tools2. Learn various tools and functions in AUTOCAD | <ol style="list-style-type: none">1. Navigate the AutoCAD user interface2. Apply the fundamental features of AutoCAD in a practical situation3. Prepare civil engineering drawings in a detailed and visually impressive way4. Streamline the planning process and become more productive with AutoCAD5. Demonstrate professional behaviour in preparation of drawings |

LIST OF EXPERIMENTS

1. **CAD:** Introduction to Computer Aided Drafting, Advantages and Disadvantages of CAD, List of CACED Softwares.
AUTOCAD: Introduction and Features of AUTOCAD Software.
2. **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.
3. **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.

4. **Editing/ Inquiry Tools:** Erase, oops, Move, Copy, Mirror, Rotate, Scale, Fillet, Chamfer, Trim, Extend, Break, Join, Stretch, Offset, Array, Distance, Radius, Angle, Area, Volume.
5. **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.
6. **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
7. **Doors and Windows:** Plans, Sections and Elevations for different types of Doors and Windows
8. **Stairs:** Details of Various Types of Staircases.
Footings: Sectional Elevations of RC footings for columns of Residential Buildings.
9. Drawing of Plans, Elevations and Sections of various types of single storey Residential Buildings.
10. Introduction to AUTOCAD 3D.

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

| | | |
|------------------------|---------------|------------------------|
| Instruction:2Hrs/ Week | SEE Marks:50 | Course Code:ES331CE |
| Credits:01 | CIE Marks: 25 | Duration of SEE: 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 Hrs/ Week | SEE Marks: 70 | Course Code:MC330CE |
| Credits:- | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">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. | <ol style="list-style-type: none">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, JaanKiusalaas., "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)

VASAVICOLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION FOR B.E. IV-SEMESTER w.e.f. 2017-18

| Course Code | IV - SEMESTER | | | | | | | | Credits |
|-------------|---|-----------------------------------|---|---|---|-----------------------|------------|-----|---------|
| | Course Name | Scheme Instruction Hours per week | | | | Scheme of Examination | | | |
| | | L | T | D | P | Duration | Max. Marks | | |
| | THEORY | | | | | Hours | SEE | CIE | |
| BS410MA | Engineering Mathematics – IV | 3 | 1 | 0 | 0 | 3 | 70 | 30 | 3 |
| MC320CE | Environmental Studies | 2 | 0 | 0 | 0 | 3 | 70 | 30 | 2 |
| PC410CE | Strength of Materials – II | 3 | 1 | 0 | 0 | 3 | 70 | 30 | 3 |
| PC420CE | Surveying-II | 3 | 0 | 0 | 0 | 3 | 70 | 30 | 3 |
| PC430CE | Fluid Mechanics – I | 3 | 0 | 0 | 0 | 3 | 70 | 30 | 3 |
| ES410CE | Building Materials and Construction | 3 | 0 | 0 | 0 | 3 | 70 | 30 | 3 |
| HS410EH | FS-II: Communication Skills in English-II | 2 | 2 | 0 | 0 | 3 | 70 | 30 | 2 |
| OE4XXXX | Open Elective – II | 1 | 0 | 0 | 0 | 2 | 35 | 15 | 1 |
| OE4XXXX | Open Elective – III | 2 | 0 | 0 | 0 | 2 | 70 | 30 | 2 |
| LABS | | | | | | | | | |
| PC441CE | Strength of Materials Lab | 0 | 0 | 0 | 2 | 3 | 50 | 25 | 1 |
| PC451CE | Surveying-II Lab | 0 | 0 | 0 | 2 | 3 | 50 | 25 | 1 |
| PC461CE | Fluid Mechanics Lab | 0 | 0 | 0 | 2 | 3 | 50 | 25 | 1 |
| Total | | 22 | 4 | 0 | 6 | | 760 | 345 | 25 |
| Grand Total | | 32 | | | | | 1105 | | |

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
ENGINEERING MATHEMATICS-IV

| | | |
|--------------------------|---------------|------------------------|
| Instruction:3+1Hrs/ Week | SEE Marks: 70 | Course Code:BS410MA |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 3 Hrs |

| COURSE OBJECTIVES | COURSE OUTCOMES |
|--|--|
| <i>The course will enable the students to:</i> | <i>At the end of the course students will be able to:</i> |
| <ol style="list-style-type: none"> 1. understand the Definition of Laplace and inverse Laplace Transforms-Shifting Properties and various theorems and how to apply them in solving Differential Equations. 2. analyze the characteristics and properties of Z-transforms and solve the Difference Equations. 3. study the concept of Fourier and inverse Fourier Transform of a function and various properties. 4. understand the Analytic functions, to evaluate a line integral of a function of a complex variable using Cauchy's integral formula, to evaluate real integrals using complex integration and how to evaluate Laurent Series and residues. | <ol style="list-style-type: none"> 1. evaluate Laplace transforms and inverse Laplace transforms of functions. Apply Laplace transforms to solve ordinary differential equations arising in engineering problems. 2. apply Z-transform in the analysis of continuous time and discrete time systems and also solve the Difference Equations using Z-transform. 3. determine Fourier transform, Fourier sine and cosine transform of a function. 4. know the condition(s) for a complex variable function to be analytic and/or harmonic and state and prove the Cauchy Riemann Equation and use it to show that a function is analytic and to define singularities of a function, know the different types of singularities, evaluate contour integrals using the Cauchy Integral Theorem and the Cauchy Integral Formula and will be able to determine transformation in a complex space. |

UNIT- I

Laplace Transforms: Introduction to Integral Transformation- Laplace transforms - Inverse Laplace transform - Sufficient Condition for Existence of Laplace Transform - Laplace Transform of Derivatives - Laplace Transform of Integrals –Translation theorems-First shifting theorem – Unit step function- Second shifting theorem – Differentiation of Laplace transform – Integration of Laplace transform - Convolution Theorem - Application of Laplace transforms to Initial value problems.

UNIT –II

Fourier Transforms: Fourier Integral Theorem(without proof) - Fourier Transforms – Inverse Fourier Transform - Properties of Fourier Transform –Fourier Cosine & Sine Transforms - Convolution Theorem.

UNIT-III

Z-Transforms: Introduction - Z-transforms of Standard sequences - Linearity Property – Scaling Property - Shifting Properties- Initial and Final value theorems – Differentiation of Z-transform - Inverse Z-Transforms- Convolution Theorem – Application of Z-Transforms to solve Difference Equations.

UNIT-IV

Functions of Complex Variables: Limits and Continuity of function - Differentiability and Analyticity - Necessary & Sufficient Condition for a Function to be Analytic - Cauchy-Riemann Equations in Cartesian & Polar Form - Milne-Thomson's method - Harmonic Functions - Complex Integration - Cauchy's Theorem - Extension of Cauchy's Theorem for multiply connected regions- Cauchy's Integral Formula.

UNIT-V

Power series - Taylor's Series - Laurent's Series (without proofs) - Zeros and Singularities –Residues – Cauchy's Residue Theorem -Evaluation of Real Definite Integrals Involving Trigonometric functions and improper integrals of the form $\int_{-\infty}^{\infty} f(x) dx$ using Residue Theorem .

Text Books:

1. R.K.Jain & S.R.K.Iyengar, "Advanced Engineering Mathematics" - 3rd Edition, Narosa Publications
2. Dr.B.S Grewal , "Higher Engineering Mathematics", 40th Edition, Khanna Publishers.
3. Goyal & Gupta, "Laplace's and Fourier transforms", Pragati prakashan

Reference books:

1. Kreyszig E, "Advanced Engineering Mathematics", 8 th Edition, John Wiley & Sons Ltd, 2006.
2. N.P.Bali & Manish Goyal, "A text book of Engineering Mathematics" Laxmi Publication.
3. H.K. Dass, Er.Rajnish Verma, "Higher Engineering Mathematics", S.Chand & company Ltd, 2011
4. R.V. Churchill, "Complex Variables & its Applications".Mc Graw-Hill Book Company, INC.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
ENVIRONMENTAL STUDIES
SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|------------------------|---------------|------------------------|
| Instruction:2Hrs/ Week | SEE Marks: 70 | Course Code:MC320CE |
| Credits:2 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">1. Describe various types of natural resources available on the earth surface.2. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems.3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity.4. Explain the causes, effects and control measures of various types of environmental pollutions.5. 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">1. Describe the various types of natural resources.2. Differentiate between various biotic and abiotic components of ecosystem.3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India.4. Illustrate causes, effects, control measures of various types of environmental pollutions.5. 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:

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

References Books:

1. De A.K., Environmental Chemistry, New Age International, 2003.
2. Odum E.P., Fundamentals of Ecology, W.B. Saunders Co., USA, 2004.
3. Sharma V.K., Disaster Management, National Centre for Disaster Management, IPE, Delhi, 2013.
4. 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+1Hrs/ Week | SEE Marks: 70 | Course Code:PC410CE |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">1. Examine and interpret the deflection of simply supported, cantilever and overhanging beams2. Analyze propped cantilevers, fixed and continuous beams for deflection, shear and bending moment3. 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 energy5. Investigate the behaviour of columns and struts. | <ol style="list-style-type: none">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 diagrams2. 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 deformation5. 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:3Hrs/ Week | SEE Marks: 70 | Course Code:PC420CE |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">1. Understand basic surveying operations and computations using theodolite for various applications in field such as determination of elevations and setting of various curves2. Learn tacheometry and hydrographic surveying3. Study the modern techniques in surveying with GPS, aerial photogrammetry, remote sensing, GIS. | <ol style="list-style-type: none">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 observations2. 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 surveying4. Apply the concepts of modern tools such as GPS and aerial photogrammetry5. 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: 3Hrs/ Week | SEE Marks: 70 | Course Code: PC430CE |
| Credits: 3 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">1. Learn the properties of fluids2. 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. | <ol style="list-style-type: none">1. Compute properties of fluid and discuss about fluid statics2. Understand various aspects of Fluid kinematics3. 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, venture 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:3Hrs/ Week | SEE Marks: 70 | Course Code:ES410CE |
| Credits:3 | CIE Marks: 30 | Duration of SEE: 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> |
| <ol style="list-style-type: none">1. Acquire knowledge on building materials such as stones, bricks, cement, aggregates, mortar and concrete.2. Study various aspects of paints, varnishes and timber.2. Learn the construction principles of floors, and different types of flooring | <ol style="list-style-type: none">1. Explain the characteristics of stones and bricks.2. Describe the properties and tests on cement, aggregate, concrete, mortar.3. Understand the significance of emerging building materials.2. Identify the suitability of timber, paints and varnishes for building works.3. 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, terrazzo 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
FS-II: COMMUNICATION SKILLS IN ENGLISH-II
SYLLABUS FOR B.E. IV-SEMESTER

| | | |
|---------------------------|---------------|------------------------|
| Instruction: 2+2Hrs/ Week | SEE Marks: 70 | Course Code:HS410EH |
| Credits:2 | CIE Marks: 30 | Duration of SEE: 3 Hrs |

| Course Objective | Course Outcomes |
|--|---|
| <ol style="list-style-type: none">1. identify the various features and functions of human language and communication.2. develop the habit of listening effectively so as to analyze the speaker's tone and tenor.3. choose appropriate words so as to speak and write accurately.4. read various types of texts and sift information correctly.5. study organizational structures and behavioral patterns and adapt appropriately. | <ol style="list-style-type: none">1. Participate in group and forum discussions by providing factual information, possible solutions, and examples.2. Debate on a topic by picking up the key points from the arguments placed.3. Provide logical conclusions to the topics under discussion.4. Prepare, present, and analyze reports.5. choose appropriate words and tone to present accurate, specific, and factual reports.6. Compose a summary of beginning high level reading text that identifies the thesis and key supporting details.7. Summarize with 70% comprehension..8. Apply reading skills, including how to approach different types of literature. |

UNIT I: PROFESSIONAL DISCUSSIONS AND DEBATES

Competencies:

- Analytical and Probing Skills
- Interpersonal Skills

Topics Covered:

Discussing

Debating

Topic Level Details

Discussing

Competencies:

- Thinking
- Assimilating

Debating

Competencies:

- Comprehending key points of the debate and note decisive points

including supporting details.

- Construct a logical chain of arguments and decisive points.
- Writing a review about a product by providing reasons, causes, and effects

UNIT II: DRAWING CONCLUSIONS

Competencies:

- Reasoning skills - Coherent and logical thinking
- Reporting and Analyzing skills.

Topics Covered:

How to draw conclusions

Importance of Logic

Topic Level Details:

Drawing conclusions

Competencies:

- Analyzing the points discussed.
- Connecting all points without gaps.
- Identifying clinchers.
- Communicating the decisions

UNIT III - REPORTING

Competencies:

- Reporting an incident
- Writing/Presenting a project report

UNIT IV - READING FOR CONTEXT

Competencies

Develop metacognitive strategies

Topics covered

Develop critical reading skills:

- Recognition of author's purpose
- Awareness of stylistic differences
- Discernment of fact and opinion
- Evaluation of fact and opinion
- Recognition of propaganda techniques
- Present vocabulary building methods
- Use comprehension and vocabulary strategies to raise reading rate.

UNIT V- SOFT-SKILLS

1. Professional integrity
2. Managing time
3. Coping with stress
4. Organizational skills

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

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|-------------------------|---------------|------------------------|
| Instruction:2 Hrs/ Week | SEE Marks:50 | Course Code:PC441CE |
| Credits:1 | CIE Marks: 25 | Duration of SEE: 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 Hrs/ Week | SEE Marks:50 | Course Code:PC451CE |
| Credits:1 | CIE Marks: 25 | Duration of SEE: 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

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|-------------------------|---------------|------------------------|
| Instruction: 2Hrs/ Week | SEE Marks: 50 | Course Code: PC461CE |
| Credits: 1 | CIE Marks: 25 | Duration of SEE: 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> |
| <ol style="list-style-type: none">1. Provide practical knowledge in verification of principles of fluid flow2. Impart knowledge in measuring coefficient of discharge for various devices. | <ol style="list-style-type: none">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 team5. 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)