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

STUDENT HAND BOOK
Academic Regulations (Autonomous) and Syllabi of
SECOND YEAR B.E(CIVIL) w.e.f 2016–17

DEPARTMENT OF CIVIL ENGINEERING
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DEPARTMENT VISION

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

DEPARTMENT MISSION

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

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

- To provide a better understanding of basic sciences and fundamentals of civil engineering.

- To develop competence in latest technologies to serve the industry or pursue higher studies.

- To inculcate professionalism with effective communication skills and ethical values.

ABOUT THE COLLEGE

Established in 1981 by Vasavi Academy of Education under the stewardship of Late Sri Pendekanti Venkata Subbaiah, a veteran statesman of independent India and by a few eminent people from different walks of life Vasavi College of Engineering represents a rich tradition of excellence in technology based education in a stimulating environment. From a modest beginning with just three undergraduate programs, viz., B.E. degree programs in Civil, Mechanical and Electronics & Communication Engineering, with dedicated efforts for over **33** years, it has now grown into a mighty center of learning with excellent and well-developed infrastructural facilities, offering 6 undergraduate programs, viz., B.E. in Civil, Mechanical, Electrical & Electronics, Electronics & Communication Engineering, Computer Science & Engineering, and Information Technology, in addition to a 3-year postgraduate program in Computer Applications (MCA), and 2-Year Postgraduate Programmes in CSE, ECE, EEE and Mechanical Engineering.

All the undergraduate (B.E) programs were accredited by National Board of Accreditation (NBA) for the academic years 2013-2015. The college sought fresh approval for NBA accreditation for two eligible PG programs and MCA program. The college has been recognized under 12(B) and 2(f) sections of the University Grants Commission (UGC).

MISSION

To arm the young brains with competitive technology and nurture the holistic development of the individuals for a better tomorrow.

The college has been granted **autonomy by the University Grants Commission**, New Delhi and Osmania University, Hyderabad for all the programs it offers for a period of six years with effect from 2014-15.

The College has 185 highly qualified and experienced faculty members consisting of Professors, Associate Professors and Assistant Professors and around**158** technical and supporting staff. The college has very good infrastructural facilities which go beyond the curriculum requirements. The college offers value-added courses in GIS, CAD/CAM, DSP, VLSI, Networking, J2EE and communication skills to bridge the gap between the curriculum and the requirements of the Industry. Finishing school has been made part of curriculum from the second year onwards to improve the skills of the students.

A Research & Development (R&D) Cell is established by personnel from industry / research organization to encourage the faculty and the students in acquiring additional qualifications and knowledge.

This Cell also facilitates the faculty for interaction with industry/research organizations in getting sponsored research projects. In addition, the college extends consultancy in various

QUALITY POLICY

Education without quality is like a flower without fragrance. It is our earnest resolve to strive towards high standards of teaching, training and developing human resources.

fields of engineering and technology. The Center for Counseling and Placement at Vasavi College of Engineering provides personal and career-related support to its students. The educational experience at the college is enlivened and enriched by an array of extra-curricular activities to fulfill the cultural and emotional needs of students.

A good number of ranks in university examinations are secured by our students every year. The all-round development of a student is achieved by exposing him/her to the outside world in a systematic and well planned manner. Just not marks and ranks, but also ethics and morals are incorporated into psyche of a student at Vasavi in a cautious way. This unification of tradition and technology makes Vasavi a place for paradise of learning.

ACADEMIC RULES AND REGULATIONS
FOR FOUR YEAR B.E DEGREE COURSE
w.e.f 2016-17 Academic Year

1. RULES OF PROMOTION

ATTENDANCE:

The **minimum aggregate attendance** percentage for BE program **is 75%**. On medical grounds 65% attendance with valid medical certificate will be considered. A candidate who did not meet above attendance requirements is not eligible to appear for the semester examinations.

A student is allowed to use medical condonation facility only 4 (four) times in the entire period of 8 semesters in the span of 4 years B.E program.

2. ASSESSMENT AND EVALUATION SYSTEM:

There will be continuous and comprehensive evaluation of students. The distribution of sessional (internal) and semester examination marks for **B.E program** are given below:

SESSIONALS EXAMS (internals)
Theory: 30 Marks

- **20** Marks each for two internal examinations in a semester and 10 marks for assignments and quizzes etc together.
- **Average of two tests** will be considered for calculating internal exams marks to which assignment/quiz marks will be added for obtaining total CIE marks.
- Every student should secure a **minimum of 40% aggregate marks in the internal exams.**

Lab: 25 Marks

15 marks for day-to-day laboratory class work which will be awarded based on the average of all experiments.
- 10 marks for the internal examination.

SEMESTER EXAMS

- Semester theory examinations will be conducted for 70 marks. A student should secure a minimum of 40% marks in each subject for a pass.

- Semester laboratory examinations will be conducted for 50 marks. A student should secure a minimum of 50% marks for a pass.
In addition, a student shall secure a minimum of 40% marks in a theory subject and 50% marks in lab from sessional exams and semester examinations put together for a pass.

3. PROMOTION RULES TO NEXT HIGHER CLASS

S No	Semester/Class	Conditions to be fulfilled for
1	From 1/4 BE, I-SEM to 1/4 BE, II-SEM	Regular course of study of 1/4 B.E, I-SEM and 40% aggregate sessional marks in I-SEM
2	From 1/4 BE, II-SEM to 2/4 BE, I SEM	(a) Regular course of study of 1/4 B.E-II SEM and (b) Must have secured at least 50% of total credits prescribed for 1/4 B.E.
3	From 2/4 BE, I-SEM to 2/4 BE, II-SEM	Regular course of study of 2/4 BE, I-SEM and 40% aggregate sessional marks in II- SEM
4	From 2/4 BE, II-SEM to 3/4 BE, I SEM	(a) Regular course of study of 2/4 BE II SEM (b) Must have secured at least 50% of total credits prescribed for 2/4B. E and passed in all the subjects 1/4 B.E.
5	From 3/4 BE, I-SEM to 3/4 BE, II-SEM	Regular course of study of 3/4 B.E, I-SEM, and 40% aggregate sessional marks in I- SEM
6	From 3/4 BE, II-SEM to 4/4 BE, I SEM	(a) Regular course of study of 3/4 B.E, II-SEM (b) Must have secured at least 50% of total credits prescribed for 3/4 B.E and passed in all the subjects 2/4 B.E.
7	From 4/4 BE, I-SEM to 4/4 BE, II-SEM	(a) Regular course of study of 4/4 B.E, I-SEMand 40% aggregate sessional marks in II- SEM

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION w.e.f 2016-17
B.E. II YEAR I- SEMESTER

S.No.	Syllabus Ref.No.	Subject	Scheme of Instruction					Scheme of Examination		Credits
			Periods per Week				Duration in Hrs.	Maximum Marks		
			L	T	D	P		SEM. Exam	Sess-ionals	
THEORY										
1	MA 2010	Mathematics-III	4	-	-		3	70	30	3
2	CE 2010	Building Planning & Drawing	2	-	3		3	70	30	3
3	CE 2020	Building Materials & Construction	4	-	-		3	70	30	3
4	CE 2030	Engineering Geology	4	-	-		3	70	30	3
5	CE 2040	Strength of Materials-I	4	2	-		3	70	30	4
6	CE 2050	Surveying-I	4	-	-		3	70	30	3
7	HS 2170	Finishing School: Communication Skills in English-I	4	-	-		3	70	30	2
8	HS2140	Human Values and Professional Ethics-I	2	-	-	-	3	70	30	1
PRACTICALS										
1	CE 2011	Engineering Geology Lab	-		-	3	3	50	25	2
2	CE 2021	Surveying-I Lab	-		-	3	3	50	25	2
3	CE 2031	Civil Engineering Drafting Lab	-		-	3	3	50	25	2
		Total	28	2	3	9	-	710	315	28
		Grand Total	42				30	1025		
INTERDISCIPLINARY COURSES OFFERED BY CIVIL TO MECHANICAL										
1	CE 2060	Mechanics of Materials	4	-	-		3	70	30	3
2	CE 2041	Mechanics of Materials Lab	-	-	-	3	3	50	25	2

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VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State
MATHEMATICS - III
SYLLABUS FOR BE 2/4 - FIRST SEMESTER

Instruction: 4 Periods per week	Sem Exam Marks : 70	Subject Ref Code : MA 2010
Credits : 3	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. **Study** the Fourier series, conditions for expansion of function and half range series	1. **Expand** any function which is continuous, discontinuous, even or odd in terms of its Fourier 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.	2. **Find** the Partial differential equations by eliminating arbitrary constants and functions and solve linear, nonlinear Partial differential equations and also will be able solve wave, heat and Laplace's equations in engineering problems .
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.	3. **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.
4. *Understand* Random variables Probability Distributions, Statistics and their applications.	4. **Apply** various probability distributions to solve practical problems, to estimate unknown parameters of populations and apply the tests of hypotheses.
5. *Understand* how to fit a curve to a given data, how Correlation between variables can be measured.	5. **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 – Conditions for a Fourier expansion – Functions having points of discontinuity – 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: Classification of second order Partial Differential Equations- Method of Separation of Variables - Solution of One **Di**mensional Heat Equation - One Dimensional Wave Equation – Two Dimensional Heat Equation - Laplace's Equation.

UNIT-III (15 classes)
Numerical Methods: Solution of Algebraic and Transcendental equations- Bisection method - Regula Falsi method- Newton-Raphson Method - 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 - Taylor's Series Method - Euler's Method - Runge-Kutta Method of 4th order(without proofs).

UNIT-IV (12 classes)
Probability and Statistics: Random Variables - Probability Distribution function for Discrete and Continuous Random variables - Expectation – Variance – Moments -Moment Generating Function- Poisson and Normal Distributions – Testing of Hypothesis - Tests of Significance - t-test - F- test - χ^2 - test for small samples.

UNIT-V (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.

Learning Resources :
1. Jain R.K. & Iyengar S.R.K., *Advanced Engineering Mathematics*, Third Edition, Narosa Publications, 2007.
2. Grewal B.S, *Higher Engineering Mathematics*, 40th Edition, Khanna Publishers.
3. Grewal B.S, *Numerical Methods*, Khanna Publishers.
4. Gupta & Kapoor, *Fundamentals of Mathematical Statistics*, Sultan Chand & Sons, New Delhi.
5. Kreyszig E, *Advanced Engineering Mathematics,* 8th Edition, John Wiley & Sons Ltd, 2006.
6. Bali N.P. & Manish Goyal, *A text book of Engineering Mathematics,* Laxmi Publication.
7. Sastry S.S., *Numerical Analysis*, PHI Learning Ltd.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
BUILDING PLANNING & DRAWING

Instruction : 2+3 Periods per week	Sem Exam Marks : 70	Subject Ref Code : CE2010
Credits : 3	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Learn the principles of planning and orientation of buildings along with building services 2. Acquire knowledge on various aspects of green buildings 3. Study the preparation and presentation of civil engineering drawings with relevant conventional signs	1. Develop building plans relevant to building bylaws 2. Explain various services utilized in buildings 3. Understanding the basics of green building 4. Draw components of buildings and roof trusses 5. Demonstrate the ability to prepare civil engineering drawings

UNIT-I :
Building Planning: Principles of planning. Relevant building bylaws (NBC & Municipal), site selection for buildings, common errors in planning, orientation of buildings. Provision of rainwater harvesting, provision for physically handicapped facilities.

UNIT-II :
Building services: Lifts, Escalators and ramps. Fire protection - its importance, development of fire, reduced spread of fire, fire resistance in structural elements, means of escape, Standing Fire Advisory Council norms. Water supply - Water distribution and plumbing fixtures.
Green Building: Concept of Green building. Principles of green building – usage of low energy materials – effective cooling and heating systems – effective electrical systems – effective water conservation systems - Certification systems.

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.

Stone Masonry: Elevation, sectional plans and cross sections of walls of ashlar, CRS-I and II Sorts and RR stone masonry.

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, RC stair cases – dog legged, open well and bifurcated. Steel spiral stair case.

UNIT-V :

Building Drawing: Plans, elevations and sections of a single storey 1-, 2- and 3- bed room residential buildings and duplex houses.

Learning Resources :

1. Kumara Swamy N., Kameswara Rao A., *Building Planning And Drawing*, Charotar Publications, 2012.
2. Shahane Y. S, *Planning and Designing Building*, Allies Book Stall, third edition, 2004.
3. Shah M.G., Kalae C.M. and Patki, S.Y., *Building Drawing*, Tata McGraw Hill Book Co., 2002.
4. Joseph De Chiara, Michael J. Crosbie, *Time-saver standards for building types*, McGraw-Hill, 2001.
5. *Green Rating for Integrated Habitat Assessment (GRIHA) guideline.*
6. David V. Chadderton, *Building Services Engineering*, 6th edition 2013, Routledge.
7. Tom Woolley, Sam Kimmins, Paul Harrison and Rob Harrison, *Green Building Handbook,* Volume I, Spon Press.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
BUILDING MATERIALS & CONSTRUCTION

Instruction : 4 Periods per week	Sem Exam Marks : 70	Subject Ref Code : CE 2020
Credits : 3	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Acquire knowledge on building materials such as stones, bricks, cement, aggregates, mortar and concrete. 2. Study various aspects of paints, varnishes and timber. 3. Learn the construction principles of floors, arches form work.	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. 4. Identify the suitability of timber, paints and varnishes for building works. 5. Review the construction principles of floors, arches and the preparation of plastering and form work.

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.
Reinforcing steel: Types of reinforcement, specifications.
Emerging Building Materials: Recycled materials, local materials and industrial waste products as a means of sustainable development, eco-friendly, smart materials and materials for repair.

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, Varnish and Distemper: Constituents, characteristics of good paints. Binders, vehicles, thinners and pigments. Painting of different types of surfaces; types of varnish, and application. Types of distemper, and application.

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.
Arches: Geometrical forms. Semicircular, segmental, HorseShoe, Stilted, Blunt, Equilateral, Acute, Three centered, Two Cupsed flat arch, Types of brick and stone arches.

Plastering, Pointing and White / Colour Washing: Types of plastering, preparation of surfaces, and defects. Types of pointing, preparation of surfaces. Preparation and application of white wash, and colour wash.
Form work and scaffolding: Requirements, types, materials, accessories, reuses and maintenance.

Learning Resources :

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, 2014.
3. Sushil Kumar, *Building Construction*, Standard Publishers, 2006.
4. Varghese P.C., *Building Materials*, PHI Learning Pvt. Ltd., Delhi, 2015.
5. *National Building Code of India*, 2005.
6. *Advances in Building Materials and Construction*, Central Building Research Institute, Roorkee, 2004.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
ENGINEERING GEOLOGY

Instruction : 4 Periods per week	Sem Exam Marks : 70	Subject Ref Code	: CE 2030
Credits : 3	Sessional Marks : 30	Duration of Sem Exam	: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
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, tsunamis 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, khondolite and charnockite.

UNIT-II :

Geological Structures: Classification, mode of origin and engineering importance of folds, faults, joints and unconformities, fault map of India.
Rock Weathering: Processes and end-products of weathering. Susceptibility of rocks to weathering; assessment of the degree of weathering. Tests of weatherability, and engineering classifications of rock weathering.

Geology of Soils: Formation of soils, soil profile, nature of parent materials, relative stability of minerals, important clay 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. Ground water provinces of India.

UNIT-IV :

Geology of 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 tunneling, pay line and over break, logging of tunnels, and geology of some well-known tunnels. Tunnel alignment.

Geological Hazards: Geological aspects of earthquakes, tsunamis and landslides.

Learning Resources:
1. Parbin Singh, *Engineering and General Geology*, S.K.Kataria & Sons, New Delhi, 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.
4. Bell F.G., *Fundamentals of Engineering Geology*, Aditya Books Pvt. Ltd., New Delhi, 2007.
5. Krynine D.P. and Judd W. R., *Principles of Engineering Geology and Geotechnics*, CBS Publishers & Distributors, First Indian Edition, 1998.
6. Subinoy Gangopadhyay, *Engineering Geology*, Oxford University Press, 2013.
7. *Seismotectonic Atlas of India*, Geological Survey of India, 2005.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
STRENGTH OF MATERIALS - I

| Instruction | : 4+2 Periods/ week | Sem Exam Marks: 70 | Subject Ref Code | : CE 2040 |
| Credits | : 3 | Sessional Marks: 30 | Duration of Sem Exam | : 3 Hours |

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of course students will be able to*
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 6. Investigate the behavior of thin cylinder, spherical shells and thick cylinders	1. Express his understanding of the basic concepts and principles of Strength of materials and solve problems of composite sections and solve problems of 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, 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.

Learning Resources:
1. Ramamrutham S., Narayanan R., *Strength of Materials,* 16th Edition, 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- Fourth Edition,* S.Chand Publications, New Delhi, 2006.
4. Junnarkar S.B., *Mechanics of Structures (Vol-I & II),* Charotar Publishing House, Anand, 2002.
5. Pytel and Singer F.L., *Strength of Materials*, Harper & Row, Fourth Edition, New York, 1998.
6. Subramanian R., *Strength of Materials,* Second Edition, Oxford University Press, 2010.
7. Ferdinand P Beer et. al., *Mechanics of Materials*, McGraw Hill, 2008.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
SURVEYING-I

Instruction	: 4 Periods per week	Sem Exam Marks: 70	Subject Ref Code: CE 2050
Credits	: 3	Sessional Marks: 30	Duration of Sem Exam: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
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 equipment used, methods, errors and analysis of data 3. Acquire knowledge on use of theodolite equipment, its adjustments, measurements, methods employed, errors and computation of data.	1. Employ basic surveying operations and computations using chain/tape; theories of errors and their analysis; computation of areas 2. Explain the instruments, systems of angle measurements, survey and plotting methods and errors in compass surveying; 3. Identify the instruments used, principles adopted and methods involved in plane table surveying. 4. Illustrate the levelling operations and apply the principles of levelling and contouring, prepare contour maps and estimate volume of earthwork 5. Interpret the principles of measurement of angles with theodolites, 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, use and adjustment of various instruments employed in chain survey. Concept of Direct and Reciprocal Ranging, Use of optical square, Offsets and errors in offsets. Obstacles in chaining, Errors and sources of errors, Tape corrections, Conventional signs. Determination of areas by Average ordinate, mid-ordinate, Trapezoidal and Simpsons rule

UNIT-II :
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. Plotting of compass survey. Distribution of closing error graphically by Bowditch Method.

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

Contouring: Definition and characteristics of contours. Direct and indirect methods of contouring. Uses of contours. Estimation of volumes of earthwork using Simpsons and Trapezoidal rules

UNIT-V:
Theodolite: Transit vernier theodolite; setting, use and temporary adjustments. Measurements of horizontal angles and bearings by repetition and reiteration methods. Permanent adjustments of transit theodolite.

Theodolite Traversing and Computations: Traversing by included angles, and bearings, conditions of closed traverse, Gale's traverse table, closing error and its adjustment, accuracy of traverse. Advantages of plotting traverse by co-ordinates, omitted measurements in traverse and their computations. Errors in theodolite survey.

Learning Resources :
1. Punmia B.C., Ashok Kumar Jain, Arun Kumar Jain, *Surveying*, Vol. 1 and 2, Lakshmi Publications, 2005.
2. Arora K.R., *Surveying*, Vol.1, 2 and 3, Standard Publishers Distributors, 11th edition 2010.
3. Subramanian R, *Surveying and Levelling, Second edition,* Oxford University Press, 2014.
4. David Clark, *Plane and Geodetic Surveying for Engineers*, Vol. 1 and 2, CBS Publishers and Distributors Pvt. Ltd, 2004.
5. Kanetker T.P. and Kulkarni S.V., *Surveying and Levelling*, Pune Vidyarthi Gruha Prakshan, Pune, 2014.
6. Venkatramaiah C., *A Text Book of Surveying,* Universities Press, Hyderabad, 2011.

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
FINISHING SCHOOL: COMMUNICATION SKILLS IN ENGLISH-I

Instruction: 4 Periods/ week	Sem Exam Marks	: 70	Subject Ref Code: HS 2170
Credits: 2	Sessional Marks	: 30	Duration of Sem Exam: 3 Hours

Course Objective	Course Outcome
• 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	• Respond to questions and Engage in an informal conversation. • Narrate a message/story/incident, both verbally and in writing. • Describe an event/a session/ a movie/ an article. • Respond to others while being in a casual dialogue. • comprehend facts given and respond in an appropriate manner. • Construct sentences in a coherent form • Provide explanations • Recognize and list the key points in a topic/message/article. • Participate in group and forum discussions by providing factual information, possible solutions, and examples. • Debate on a topic by picking up the key points from the arguments placed. • Provide logical conclusions to the topics under discussion. • 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 HUMANITIES AND SOCIAL SCIENCES
SYLLABUS FOR B.E. 2/4 I-SEMESTER
HUMAN VALUES AND PROFESSIONAL ETHICS-I

Instruction : 2 Periods per week	Sem Exam Marks : 70	Subject Ref Code : HS2140
Credits : 1	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

Course objectives	Course outcomes
The course will enable the students to:	At the end of the course students should be able to:
- Get a holistic perspective of value-based education. - Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations. - Understand professionalism in harmony with self and society. - Develop ethical human conduct and professional competence. - Enrich their interactions with the world around, both professional and personal.	- Gain a world view of the self, the society and the profession. - Make informed decisions. - Start exploring themselves in relation to others and their work –constantly evolving into better human beings and professionals. - Inculcate Human values into their profession. - Validate their aspirations through right understanding of human relationship and see the co-relation between the human values and prevailing problems. - Strike a balance between physical, mental, emotional and spiritual parts their being. - Obtain a holistic vision about value-based education and professional ethics.

UNIT-I:

The purpose of life-Individual to society to the ideal –individual transformation as a stepping stone to idealism- the flow of transformation from individual to society – An awakened society as a basis to move towards the concept of idealism. How do lifestyles and habits affect the basic behavior? What is the roadmap to a healthy lifestyle and how does it impact the individual, furthermore, how does it enhance the purpose of life.

Philosophy of Life from different cultures–value of life–Objective of life-
The Physical, Mental and Emotional aspects of man-Building an integrated personality. Ways and means to accomplish it.

UNIT-II:

Time Management-Why is it essential? Impediments-how best to manage time? Benefits of effective time-management. How to make the best of the present?

UNIT-III:

Positive thinking-The need, nature and scope of positive Thinking-Positive thinking as a foundation to success and building character – Introspection and Self-analysis-identifying the desirable traits-Building of right character. Meaning of values versus skills. Self-worth and Professional worth. Professional Obligations and Competence. Work-life balance.

UNIT-IV:

Different lifestyles and habits- **Excellence-Professional & Personal ethics in Society**-Goals-Striking a balance between excellence and goals and how to aim for excellence and achieve it with ethics.

UNIT-V:

Potentials and harnessing Potentials-Self-Hidden Potentials-Weeding out Weaknesses-Channelizing the potential. Optimizing potential to achieve goals.

Learning Resources:
1. B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
2. A.N Tripathy, 2003 Human values, New Age International Publishers.
3. EG Seebauer & Robert L. Berry,2000, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.
4. Mike Martin and Ronald Schinzinger "Ethics in Engineering "McGraw Hill
5. Charles E Haris, Micheal J Rabins, " Engineering Ethics "Cengage Learning

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
ENGINEERING GEOLOGY LABORATORY

Instruction : 3 Periods per week	Sem End Exam Marks : 50	Subject Ref Code: CE 2011
Credits : 2	Sessional Marks : 25	Duration of Sem Exam: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
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. Measure the attitude of beds and draw the sections for geological maps. 4. Operate electrical resistivity meter. 5. Describe the various types of maps.	1. Identify the minerals, rocks and various structural features like folds, faults and unconformities. 2. Calculate the specific gravity, porosity and water absorption in different rocks. 3. Measure the electrical resistivity of rocks, soil etc and determines the depth of water table. 4. Locate the occurrence of different rocks, soils and study of topographic maps. 5. Draw the sections pertaining to the study of folds, faults and unconformities.

LISTOF EXPERIMENTS
1. Identification and description of physical properties of minerals.
2. Identification and description of geotechnical characteristics of rocks; IS: 1123 - 1975.
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.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
SURVEYING-I LABORATORY

Instruction : 3 Periods per week	Sem Exam Marks: 50	Subject Ref Code: CE 2021
Credits : 2	Sessional Marks: 25	Duration of Sem Exam: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Learn the principal of working from whole to part and errors in surveying. 2. Develop skills for applying classroom knowledge to field problems and handling of measuring tools. 3. Learn the ability to work in a team and make effective presentations.	1. Locate the objects, measure the distances and area and transfer the same onto the drawings 2. Demonstrate controlling the accumulation of errors. 3. Compute the distances, angles, reduced levels and setting out works using chain and tape, prismatic compass, auto levels, plane table and theodolite. 4. Practice working as a team member and make effective presentations

LIST OF EXPERIMENTS
1. Practice of direct and indirect ranging and measuring the distance using Chains and Tapes.
2. Application of traversing to locate a building and field objects - Plotting.
3. Traversing by using compass – plotting and adjustments.
4. Plane table survey- radiation and intersection methods.
5. Solution to resection by Two-point problem.
6. Solution to resection by Three-point problem using trial and error method and tracing paper methods.
7. Reduction of levels by HI & Rise and fall method.
8. Cross section levelling and plotting using Autolevel.
9. Contour surveying and plotting using grid method.
10. Measurement of horizontal angles using repetition and reiteration methods.
11. Traversing using theodolite – distribution of errors using Gales traverse table.
12. Demonstration of minor surveying instruments.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER
CIVIL ENGINEERING DRAFTING LABORATORY

Instruction	: 3 Periods per week	Sem Exam Marks	: 50	Subject Ref Code: CE 2031
Credits	: 2	Sessional Marks	: 25	Duration of Sem Exam: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*students will be able to*
1. Use the functions and commands of AutoCAD software to create, save, and print drawings that make use of multiple lines, geometric shapes, and curves.	1. Navigate the AutoCAD user interfaces
2. Locate and apply the many features of AutoCAD that automate the drafting process and facilitate the creation of more accurate drawings in less time than traditional drafting methods.	2. Use the fundamental features of AutoCAD
	3. Use the precision drafting tools in AutoCAD to develop accurate technical drawings
3. Locate and apply the features of AutoCAD that provide for the accurate addition of dimensions, tolerances, and drawing notes and labels using symbols and placements recognized by multiple standards organizations.	4. Present drawings in a detailed and visually impressive way
	5. To streamline the design process and become more productive with AutoCAD
4. Use the functions and commands of AutoCAD software to create isometric and three-dimensional drawings and models.	

LIST OF EXPERIMENTS

1. **CAD:** Introduction to Computer Aided Drafting, Advantages and Disadvantages of CAD, List of CACED Software.
   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 Stone masonry and RC footings of foundations for Residential Buildings.

9. Drawing of Plans, Elevations and Sections of a Various Types of single Storey, Buildings- Residential, Commercial.

10. Introduction to AUTOCAD 3D.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR B.E. 2/4 I-SEMESTER
MECHANICS OF MATERIALS (for Mechanical Engineering)

| Instruction | : 4 Periods/ week | Sem Exam Marks | : 70 | Subject Ref Code | : CE 2060 |
| Credits | : 3 | Sessional Marks | : 30 | Duration of Sem Exam | : 3 Hours |

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Examine and interpret basic concepts of Strength of materials and analyze statically determinate and indeterminate structures to compute axial stresses, strains and deformations.	1. Express his 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. Analyze simple beams subjected to various types of loading and plot shear force and bending moment diagrams analytically and graphically and compute bending stresses.	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. Define and analyze shear stresses in beams and plot shear stress distribution across cross section of beams	3. Compute direct and bending stresses in columns and beams subjected to eccentric loading.
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	4. Compute internal forces in space trusses by method of tension coefficients
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	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 over hangs 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.

Learning Resources :

1. Ramamrutham S., Narayanan R., *Strength of Materials,* 16th Edition, 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- Fourth Edition,* S.Chand Publications, New Delhi, 2006.
4. Junnarkar S.B., *Mechanics of Structures (Vol-I & II),* Charotar Publishing House, Anand, 2002.
5. Pytel and Singer F.L., *Strength of Materials*, Harper & Row, Fourth Edition, New York, 1998.
6. Subramanian R., *Strength of Materials,* Second Edition, Oxford University Press, 2010.
7. Ferdinand P Beer et. al., *Mechanics of Materials*, McGraw Hill, 2008.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 – FIRST SEMESTER (SERVICE COURSES)
MECHANICS OF MATERIALS LABORATORY
(Mechanical Engineering)

Instruction	: 4Periods/ week	Sem Exam Marks	: 50	Subject Ref Code	: CE 2041
Credits	: 2	Sessional Marks	: 25	Duration of Sem Exam	: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
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 conducing 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.

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. Brinnels 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
SCHEME OF INSTRUCTION AND EXAMINATION w.e.f 2016-17
B.E. II YEAR II- SEMESTER

S. No.	Syllabus Ref.No.	Subject	Periods per Week				Duration in Hrs.	Maximum Marks		Credits
			L	T	D	P		SEM. Exam	Sessio nals	
		THEORY								
1	CE 2510	Strength of Materials – II	4	2	-	-	3	70	30	4
2	CE 2520	Surveying-II	4	-	-	-	3	70	30	3
3	CE 2530	Fluid Mechanics-I	4	-	-	-	3	70	30	3
4	CE 2090	Environmental Studies	4	-	-	-	3	70	30	3
5		*Electrical & Mechanical Technology*								
	EE 2100	Part – A Electrical Technology	3	-	-	-	3	35	15	2
	ME2080	Part – B Mechanical Technology	2	-	-	-	3	35	15	2
6	CE 2540	Concrete Technology	4	-	-	-	3	70	30	3
7	HS 2270	Finishing School: Communication Skill in English -II	4	-	-	-	3	70	30	2
		PRACTICALS								
1	CE 2511	Strength of Materials Lab	-		-	3	3	50	25	2
2	CE 2521	Surveying-II Lab	-		-	3	3	50	25	2
3	CE 2531	Fluid Mechanics Lab	-		-	3	3	50	25	2
		Total	29	2		9	-	640	285	28
		Grand Total	40					925		

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
STRENGTH OF MATERIALS - II

Instruction : 4+2 Periods/week	Sem Exam Marks : 70	Subject Ref Code : CE 2510
Credits : 4	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will be able to	*Upon the completion of this course students will be able to*
1. Examine and interpret the deflection of simply supported, cantilever and overhanging beams	1. Express his 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. Analyze propped cantilevers, fixed and continuous beams for deflection, shear and bending moment	2. Determine shear centre for simple sections.
3. Locate shear centre and draw shear flow in simple sections.	3. Compute the torsional shear stress across the cross section of circular shafts.
4. Analyze torsion of circular shafts and analyse helical and bending springs and examine the concept of strain energy	4. Compute stresses in helical springs and compute strain energy in bars subjected to axial and flexural deformation
5. Investigate the behaviour of columns and struts.	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.

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.

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.

Shear Centre: Concept and importance of shear center shear flow and determination of shear center 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 – Gordan's formula, straight-line formula, effect of end conditions, slenderness ratio, eccentrically loaded columns, and Secant and Perry's formulae.

Learning Resources:

1. Ramamrutham S., Narayanan R., *Strength of Materials,* 16th Edition, 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- Fourth Edition,* S.Chand Publications, New Delhi, 2006.
4. Junnarkar S.B., *Mechanics of Structures (Vol-I & II),* Charotar Publishing House, Anand, 2002.
5. Pytel and Singer F.L., *Strength of Materials*, Harper & Row, Fourth Edition, New York, 1998.
6. Subramanian R., *Strength of Materials,* Second Edition, Oxford University Press, 2010.
7. Ferdinand P Beer et. al., *Mechanics of Materials*, McGraw Hill, 2008.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
SURVEYING-II

Instruction : 4 Periods/week	Sem Exam Marks : 70	Subject Ref Code : CE 2520
Credits : 3	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
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 total station, GPS, 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 total station and GPS 5. Understand the concepts of Remote sensing and GIS and apply them in civil engineering problems

UNIT-I :
Measurement of vertical angles: 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 instrumental methods. Obstructions in curve ranging. 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. Reduction by calculations; Tacheometric tables;
Hydrographic Survey: Brief introduction, methods and applications.

UNIT-IV :
Total Station; Features, concepts, types and applications
GPS: Overview of GPS, Functional system of GPS – Space segment, control segment and user segment, working principle of GPS/DGPS, Errors in GPS

UNIT-V :
Remote Sensing: Definition, Elements of remote sensing, Electromagentic spectrum and radiation, concept of spectral reflectance, Types of remote sensing, Remote sensing satellites, sensor resolutions, and applications to Civil Engineering.
GIS: Definition, components of GIS, Functions and advantages of GIS, applications to Civil Engineering

Learning Resources:
1. Punmia B.C., Ashok Kumar Jain, Arun Kumar Jain, *Surveying,* Vol. 1 and 2, Lakshmi Publications, 2005.
2. Duggal S.K., *Surveying-II,* Mc Graw Hill, 4th edition, 2013.
3. Basudeb Bhatta, *Remote Sensing and GIS,* Second edition, Oxford University Press, 2011.
4. Subramanian R., *Surveying and Levelling, Second edition,* Oxford University Press, 2014.
5. Venkatramaiah C., *A Text Book of Surveying,* Universities Press, Hyderabad, 2011.
6. David Clark, *Plane and Geodetic Surveying for Engineers,* Higher Surveying Vol. 2, CBS Publishers and Distributors Pvt Ltd, 2004.
7. Arora K.R., *Surveying,* Vol.1 and 2, Standard Publishers Distributors, 2010.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
FLUID MECHANICS-I

Instruction : 4 Periods/week	Sem Exam Marks	: 70	Subject Ref Code	: CE 2530
Credits : 3	Sessional Marks	: 30	Duration of Sem Exam	: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
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 compressible fluid flow.	1. Compute properties of fluid, discuss about fluid statics and fluid kinematics. 2. Formulate equations based on conservation of mass, energy and momentum. Analyse forces on nozzles and bends. 3. Describe the devices used for discharge and pressure measuring devices and solve problems on them. 4. Identify, discuss and solve problems on compressible flow. 5. Compute Reynolds number, formulate equations for laminar and turbulent flow through pipes and water hammer in pipes.

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.

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-II :

Fluid Dynamics: Body forces and surface forces. Euler's equation of motion from control volume and system analysis.

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, kinetic energy correction factor.

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

UNIT-III :

Measurement of Pressure: Piezometer and Manometers. Micro-manometer. Bourdon Gauge. Pressure Transducers, Absolute pressure and Gauge pressure.

Measurement of Discharge in Pressure Conduits: Venturi meter, orifice meter and nozzle meter, elbow meter, and rota-meter.

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

Measurement of velocity – pitot tube; pitot static tube and current meter.

UNIT-IV :

Compressible Flow: Compressibility of liquids and gases. Continuity equation, Bernoulli's energy equation (for isothermal and adiabatic processes) and impulse momentum equation. Velocity of a pressure wave for adiabatic and isothermal processes. Mach Number and Mach cone, and its applications. Stagnation pressure, density and temperature in adiabatic process.

UNIT-V :

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.

Learning Resources :

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*, Lakshmi Publications, 2010.
3. Ojha C.S.P., Berndtsson R., Chandramouli P.N., *Fluid Mechanics and Machinery*, Oxford University Press, 2012.
4. Rajput R.K., *Fluid Mechanics and Hydraulic Machines,* S. Chand & Co., 2013.
5. Jain K., *Fluid Mechanics*, Khanna Publishers, Delhi, 1998.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
ENVIRONMENTAL STUDIES

Instruction	: 4 Periods/week	Sem Exam Marks	: 70	Subject Ref Code	: CE 2090
Credits	: 3	Sessional Marks	: 30	Duration of Sem Exam	: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Describe various types of natural resources available on the earth surface. 2. Explain the concepts, energy flow in ecosystem along with 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 pollutions and environmental protection acts. 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.	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 and environmental protection acts. 5. Explain the causes, effects of climate change, global warming, acid rain and ozone layer depletion, various types of disasters and their mitigation measures and list the methods of water conservation and watershed management.

UNIT-I :

Environmental Studies: Definition, scope and importance, need for public awareness. Natural resources: Water resources; floods, drought, conflicts over water, dams-benefits and problems. Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources, growing energy needs, renewable and non-renewable energy sources. Land Resources, land as a resource, land degradation, soil erosion and desertification.

UNIT-II :

Ecosystems: Concepts of an ecosystem, structure and function of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, oceans, estuaries).

UNIT-III :

Biodiversity: Genetic species and ecosystem diversity. Value 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 pollutions, noise pollution, thermal pollution and solid waste & e-waste management.
Environment Protection Act: Air, water, forest and wild life acts.

UNIT-V :

Social Aspects and the Environment: Water conservation, watershed management, and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion. EIA, population explosion.
Disaster Management: Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology, disaster management cycle, and disaster management in India.

Learning Resources :

1. Deswal S. and Deswal A., *A Basic Course on Environmental studies*, Dhanpat Rai & Co Pvt. Ltd. 2004.
2. Benny Joseph, *Environmental Studies*, Tata McGraw-Hill, 2005.
3. Suresh K. Dhameja, *Environmental Studies*, S.K. Kataria & Sons, 2010.
4. De A.K., *Environmental Chemistry*, New Age International, 2003.
5. Odum E.P., *Fundamentals of Ecology*, W.B. Sunders Co., USA, 2004.
6. Sharma V.K., *Disaster Management*, National Centre for Disaster Management, IIPE, Delhi, 1999.
7. Rajagopalan R., *Environmental Studies*, Second Edition, Oxford University Press, 2013.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
ELECTRICAL AND MECHANICAL TECHNOLOGY
PART–A ELECTRICAL TECHNOLOGY

Instruction	: 3 Periods per week	Sem End Exam Marks	: 35	Subject Ref Code	: EE 2100
Credits	: 2	Sessional Marks	: 15	Duration of Sem Exam	: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Learn DC, AC single phase and 3 phase circuits. 2. Study the construction, principle of operation and characteristics of DC machines, 1 phase and 3 phase AC machines.	1. Identify, analyze DC and AC circuits. 2. Apply the fundamental laws to any electrical network to solve problems. 3. Classify and demonstrate the performance of DC and AC machines.

UNIT-I :
D.C. Circuits: Ohm's law, Kirchoff's laws, Resistance networks, Series, parallel, and series - parallel circuits with D.C. sources. Power loss in resistive elements.

Alternating Currents: Principles of production of AC waveform, frequency, Effective value and form factor, Effective values of current and voltage, Vector representation, Behaviour of pure inductance, capacitance and resistance with sinusoidal sources, Impedance and power factor, simple AC network with R, L & C elements under steady-state, Three-Phase circuits under balanced conditions, Star-delta connections, Power in balanced three-phase circuit.

UNIT-II :
Transformers: Ideal transformers, Principles of transformation, Working of actual transformer under no-load and load conditions, approximate equivalent circuit, Open circuit & Short circuit tests, Regulation and efficiency.

UNIT-III :
Induction Motors: Types of Induction motors, Production of rotating magnetic field, Synchronous speed, Torque production, Slip and speed of motor, Slip-torque characteristics. Starting of induction motors, Applications of induction motors.

Illumination: Units of light measurement, Coefficient of utilization and depreciation, Polar curves, Calculations of street lighting.

Learning Resources :
1. Gupta J.B., *Fundamentals of Electrical Engineering*, S.K.Kataria& Sons, 2002.
2. Mehta V.K., *Principles of Electrical Engineering*, S. Chand & Co., 1995.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
ELECTRICAL AND MECHANICAL TECHNOLOGY
PART–B MECHANICAL TECHNOLOGY

Instruction	: 2 Periods per week	Sem Exam Marks	: 70	Subject Ref Code	: ME 2080
Credits	: 2	Sessional Marks	: 30	Duration of Sem Exam	: 3 Hours

Course Objectives	Course Outcomes
In this subject the students will	*Upon the completion of this course students will be able to*
• Learn the basic principles of excavating equipment, conveying equipment hoisting equipment, concrete producing equipment and pneumatic equipment	• Demonstrate the applications of Earth Moving equipment . • Determine the working principles and applications of Conveying Equipment & Hoisting Equipment. • Determine the Mechanism Involved in Concrete Producing Equipment and Pneumatic Equipment.

UNIT– I
Excavating Equipment: General description, operation, maintenance and selection of the following: Earth moving and Excavating Equipment: Shovels, Dragline, Clamshell, Cable excavator, Bucket wheel excavator, Tractor, Bulldozer, Scraper, Trenchers, Grader, Earth Compactors.

UNIT– II
Conveying Equipment: Belt conveyor, Screw Conveyor, Bucket Conveyor, Apron Conveyor, Aerial Ropeway.

Hoisting Equipment: Hoist winch. Differential and Worm geared chain hoists. Fork lift trucks, Guyed and stiffly derricks, swing and non– swing mobile crane, whirler crane, Construction elevator, passenger lift and Bucket elevators.

UNIT– III
Aggregate and Concrete Producing Equipment: Crushers – Jaw, Gyratory, Hammer and Roll Crushers, Screens – Stationary, Shaking and Vibrating screens. Concrete mixers and Concrete pumps.

Pneumatic Equipment: Reciprocating air– compressor, construction pneumatic tools; jack hammer, paving breaker, Rock drill, concrete vibrator.

Learning Resources:
1. Peurifoy R.L., *Construction Planning Equipment and Methods*, McGraw Hill Publishers, 1996.
2. Mahesh Varma, *Construction Equipment and its planning and application*, Metropolitian books Co, Delhi, 2004.
3. Goodes Spence, *Building and Civil Engineering Plant*, Crosby Lock Wood, 1995.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
CONCRETE TECHNOLOGY

Instruction	: 4 Periods per week	Sem Exam Marks	: 70	Subject Ref Code	: CE 2540
Credits	: 3	Sessional Marks	: 30	Duration of Sem Exam	: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Acquire knowledge of properties of concrete and special concretes. 2. Study the utility of admixtures in concrete. 3. Design concrete mixes of requisite strength.	1. Explain the preparation and properties of concrete. 2. Examine the influence of admixtures on the properties of concrete. 3. Interpret the concepts of high density concrete, light weight concrete, ready mixed concrete, recycled aggregate concrete and high performance concrete . 4. Describe the mechanism, properties and applications of fibre reinforced concrete. 5. Design concrete mixes for requisite strength with I S Code, British and ACI methods.

UNIT-I :
Constituents of Concrete: Types of cements and their composition. Tests on various properties of aggregates.
Properties of fresh concrete: Mixing and batching. Workability, factors effecting workability, various tests procedures. Segregation and bleeding. Vibration of concrete. Types of vibrators and their influence on composition. Analysis of fresh concrete.

UNIT-II :
Properties of Hardened concrete: Strength of concrete. Water cement ratio. Gel space ratio. Effective water in the mix. Short term and long term properties of concrete. Tests and procedures. Influence of various parameters on strength of concrete. Relationship between various mechanical strengths of concrete. Curing of concrete. Maturity concept. Stress-strain curves of concrete. Durability of concrete.

UNIT-III :
Mix design of concrete: Basic considerations, Parameters of mix design. Factors in the choice of mix proportions and their influence. Quality control. Various methods of mix design. I.S.Code method. British and ACI methods.

UNIT-IV :
Admixtures used in concrete: Classification of admixtures. Chemical and mineral admixtures. Influence of various admixtures on properties of concrete. Applications. Concept of ready mixed concrete. Fly ash concrete – properties and proportion of fly ash, applications; Recycled aggregate concrete.

UNIT-V :
Special Concrete: High strength concrete, High performance concrete, Ferro cement, Light weight concrete, High density concrete. Self-compacting concrete - their specialties and applications.
Fibre Reinforced Concrete: Need for Fibre reinforced concrete (FRC), Mechanism of FRC, types of fibres, fibre shoterete.

Learning Resources:
1. Shetty M.S., *Concrete Technology*, S.Chand & Company, 2013.
2. Neville A.M., *Properties of Concrete*, English Language Book Society/ Longman Publications, 2012.
3. Mehta P.K., and Paulo J.M.M., *Concrete-Microstructure-Properties and Material*, McGraw Hill Publishers, 2013.
4. Krishnaraju N., *Design of Concrete Mixes*, CBS Publishers, 2012.
5. Gambhir M.L., *Concrete Technology*, McGraw Hill Education (India) Private Limited, 2013.
6. SanthakumarA.R.,*Concrete Technology*, Oxford University Press, 2006.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 SECOND SEMESTER

FINISHING SCHOOL: COMMUNICATION SKILLS IN ENGLISH-II

Instruction : 4 Periods per week	Sem Exam Marks : 70	Subject Ref Code : HS2270
Credits : 2	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

Course Objective	Course Outcomes
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.	• Participate in group and forum discussions by providing factual information, possible solutions, and examples. • Debate on a topic by picking up the key points from the arguments placed. • Provide logical conclusions to the topics under discussion. • Prepare, present, and analyze reports. • choose appropriate words and tone to present accurate, specific, and factual reports. • Compose a summary of beginning high level reading text that identifies the thesis and key supporting details. • Summarize with 70% comprehension.. • 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:
o Recognition of author's purpose
o Awareness of stylistic differences
o Discernment of fact and opinion
o Evaluation of fact and opinion
o Recognition of propaganda techniques
o Present vocabulary building methods
o 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

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
STRENGTH OF MATERIALS LABORATORY

Instruction	: 3 Periods/ week	Sem Exam Marks	: 50	Subject Refe Code	: CE 2511
Credits	: 2	Sessional Marks	: 25	Duration of Sem Exam	: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
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 conducing 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. Brinnels 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

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
SURVEYING-II LABORATORY

Instruction	: 3 Periods per week	Sem Exam Marks	: 50	Subject Ref Code	: CE 2521
Credits	: 2	Sessional Marks	: 25	Duration of Sem Exam	: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Apply classroom knowledge in laboratory exercises and handling of Theodolite, GPS and Total station. 2. Learn the ability to work in a team and make effective presentations.	1. Determine the RL of a given point in different practical situations 2. Apply the principles of tacheometry in the field 3. Compute the distances, angles, reduced levels and setting out works using total station 4. Locate the ground features using GPS 5. Practice working as a team member and make effective presentations.

List of Experiments

1. Measurement of vertical angles; application to simple problems of height and distance using angle of elevation and depression.
2. R. L. 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 or stadia tacheometry.
6. Horizontal and vertical distance measurement using Total Station,
7. Location of ground features using total station and plotting the same.
8. Traversing and area calculation using Total Station - Plotting.
9. Plotting of simple curve using linear method.
10. Plotting of simple curve using angular method with theodolite and total station.
11. Location of ground features using GPS instrument and plotting the same after processing the data
12. Developing contour maps for a land using modern instruments.

DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BE 2/4 - SECOND SEMESTER
FLUID MECHANICS LABORATORY

Instruction	: 3 Periods per week	Sem End Exam Marks	: 50	Subject Ref Code	: CE 2531
Credits	: 2	Sessional Marks	: 25	Duration of Sem Exam	: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Calculate coefficient of discharge for orifice, mouth piece, notches and weirs and venturimeter.	1. Calculate coefficient of discharge for orifice, mouth piece, notches and weirs and venturimeter.
2. Estimate Cd for hemi-circular vessel.	2. Estimate C_d for hemi-circular vessel.
3. Calculate Reynold's number and classify types of flows.	3. Calculate Reynold's number and classify types of flows.
4. Calculate Darcy's coefficient of friction for turbulent flow in pipes.	4. Calculate Darcy's coefficient of friction for turbulent flow in pipes.
5. Verify Bernoulli's theorem.	5. Validate Bernoulli's theorem.

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)

DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION W.E.F 2016-17
2/4 B.E. Bridge Course (for Lateral Entry Students of all branches)

I-Semester

S No.	Code	Subject	Scheme of Instruction Periods per week				Duration	Scheme of Examination Maximum Marks		Credits
			L	T	D	P		SEM Exam	Sessionals	
Theory										
1	MA2040	Mathematics	1	-	-	-	90 min	25	-	-
2	PH2130	Physics of materials	1	-	-	-	90 min	25	-	-
3	CE2080	Engineering Mechanics	2	-	-	-	3 hrs	50	-	-
Practicals										
4	CS 2091	C-Programming Lab	-	-	-	2	3 hrs	50	-	-
			4	-	-	2	-	150	-	-
II-Semester Practical										
1	HS2231	ELT-LAB	-	-	-	2	3	50	-	-

No credits will be awarded to the bridge courses offered at 2/4 B.E (all branches) lateral entry students admitted from the academic year 2015-16 under autonomous status. However pass in each of these courses is mandatory to obtain the degree. Every student shall get 40% marks in each course for a pass in theory subject and 50% marks in laboratory course. Only semester examinations will be conducted at the end of each semester. The marks/Grades obtained by the student in this course **will not be added in computing the SGPA/CGPA**

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DEPARTMENT OF CIVIL ENGINEERING
SYLLABUS FOR BRIDGE COURSE BE 2/4-FIRSTSEMESTER (All branches)
ENGINEERING MECHANICS

Instruction :2periodsweek	Subject Reference Code: **CE2080**
Sem Exam Marks: **50**	Duration of Sem Exam:**3Hrs**

COURSE OBJECTIVES	COURSE OUTCOMES
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.	*Students will be able to:* 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 (3periods)
Force Systems: Components of forces, moments in space and its applications.

UNIT-II (4periods):
Friction: Laws of friction. Application to simple systems and wedge friction.

UNIT-III (5periods):
Kinematics: Rectilinearmotion,Curvilinearmotion,Velocityandacceleration of a particle.

UNIT-IV (6periods):
Kinetics: Analysis as a particle. Analysis as a rigid body in translation. Fixed axis rotation and Rolling bodies.

UNIT-V (5periods):
Work Energy: Principles of work energy, and its application to translation, Particle motion and connected systems.

Learning Resource:
1. F.L.Singer, "Engineering Mechanics", Harpper & Collins, Singapore 1994.
2. S.P.Timoshenko and D.H.Young, "Engineering Mechanics", McGraw Hill International Edition, 1983
3. Andrew Pytel., Jaan Kiusalaas., "Engineering Mechanics", Cengage Learning, 2014.
4. F.P.Beer & E.R.Johnston, "Jr. Vector Mechanics for Engineers", TMH, 2004.
5. R.C.Hibbeler & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2008.
8. Meriam. J. L., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2008.
9. NPTEL Course and Virtual labs on the web.

DEPARTMENT OF MATHEMATICS
SYLLABUS FOR BRIDGE COURSE BE 2/4-FIRSTSEMESTER(for All branches)
MATHEMATICS

Instruction :1periodweek	Subject Reference Code: **MA2040**
Sem Exam Marks: **25**	Duration of Sem Exam:**90 Min**

Unit -I (6 Periods):
Basics of Statistics & Probability: Measure of central tendency (Mean, Median & Mode) - Definition of Probability - Addition & Multiplication theorem - Discrete random variable

Unit – II (6 Periods):
Integral Calculus: Methods of integration- Multiple Integrals -Applications of Integration - areas - Surface areas - Volume of solid of revolution

LEARNING RESOURCES:
1. B.S. Grewal , Higher Engineering Mathematics.
2. Fundamentals of Mathematical Statistics by Gupta & Kapoor
3. Integral calculus by Shantinarayana

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w.e.f. the academic year 2015-16

DEPARTMENT OF PHYSICS
SYLLABUS FOR BRIDGE COURSE BE 2/4-FIRSTSEMESTER (All branches)
PHYSICS OF MATERIALS

Instruction : 1periodweek	Subject Reference Code: **PH2130**
Sem Exam Marks: **25**	Duration of Sem Exam:**90 Min**

Course objectives	Course Outcomes *Student should be able*
• To apply basic principles of physics in field of engineering • Analyze the characteristics of semiconductor devices • To take up research at Undergraduate Level in new and emerging areas like materials science including magnetic dielectrics and nanotechnology	• Differentiate properties, characteristics and applications of various materials like magnetic, dielectric and semiconducting materials • Inquire the new trends in interdisciplinary research area such as Magnetic materials, dielectric materials Semiconductors and nanotechnology

UNIT -I
1. Dielectric Materials: (3 periods)
Polar and Non polar dielectrics-Different types of polarizations in dielectrics-Ferro-electric materials: properties and applications.
2. Magnetic Materials: (3 periods)
Ferro, Ferri and anti ferro magnetic materials and their properties, Domain theory of ferromagnetism- Hysteresis (B-H) curve-soft and hard magnetic materials

UNIT – II:
1. Semiconductor Devices: (3 periods)
Fermi energy in semiconductor- Intrinsic carrier concentration of semiconductor-Characteristics of Photo diode and solar cell
2. Nano Materials: (3 periods)
Distinction between Bulk, thin and nano material-Surface to volume ratio-Quantum confinement-Basic properties of nano-materials, Applications of Nano materials and CNT's.

LEARNING RESOURCES:
1. Introduction to Solid State Physics, Kittel C, Wiley Eastern
2. A text book of Engineering Physics, Avadhanulu & Kshirasagar
3. Applied Physics for Engineers, Neeraj Mehta, PHI
4. N Chattopadhyay, K. K.Banerjee- Introduction to Nanoscience and Nanotechnology, PHI

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w.e.f. the academic year 2015-16

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS FOR BRIDGE COURSE BE 2/4-FIRST SEMESTER (for All branches)
C-PROGRAMMING LAB

Instruction :2periods/week	Subject Reference Code: CS 2091
Sem Exam Marks: **50**	Duration of Sem Exam:**3hr**

Course objective	Course outcomes
Students should be able to	Students will be able to
• understand the fundamentals of programming in C Language • write, compile and debug programs in C • formulate problems and implement in C • effectively choose programming components to solve computing problems	• draw flowcharts and write algorithms for a given problem • choose appropriate data types for writing programs in C language • design programs involving input output operations, decision making and looping constructs • design modular programs

1. Finding roots of quadratic equation
2. Check whether a given number is (i) Prime (ii) Perfect (iii) Am Strong
3. Sin x and Cos x values using series expansion.
4. Menu driven program to calculate income tax
5. Generating Pascal's Triangle
6. Frequency of occurrence of characters and special characters like \n, \t, white spaces.
7. Bubble sort, Selection sort using arrays
8. Linear search and Binary Search.
9. Functions to find maximum and minimum of given set of numbers, interchange two numbers
10. Recursion: Factorial, Fibonacci, GCD of given numbers
11. Functions for string manipulations without using library functions
12. String comparisons and sorting using pointers to strings.
13. Matrix addition and multiplication using pointers
14. Programs on Structures and Unions
15. File handling programs, Finding the no: of characters, words and lines of given text file.
16. **Mini Project**: Simple application using the concepts of C language

Learning Resources:
1. B.A.Forouzan & Richard F.Gilberg, *A Structured Programming Approach using C*, 3rd Edition, Cengage Learning, 2013
2. Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language* 2nd Edition, Prentice-Hall, 2006
3. E.Balagurusamy, *Programming in ANSI C*, TMG, 4th Edition, 2008.

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DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES (for All branches)
SYLLABUS FOR BRIDGE COURSE BE 2/4– SECOND SEMESTER
ELT-LAB

Instruction :2periodsweek	Subject Reference Code: **HS2231**
Sem Exam Marks: **50**	Duration of Sem Exam: 2hrs

Course objectives	Course Outcomes
• Use language effectively without mother tongue influence. • Converse in various situations. • Make paper and power point presentations. • Listen to audio clippings, exchange dialogues and write short texts. • Speak effectively using discourse markers. • Read and understand various forms of texts and review them.	• Pronounce words in isolation as well as in spoken discourse. • Research and sift information to make presentations. • Comprehend the tone and tenor of various types of speeches from media and classroom lectures. • Listen for gist and make inferences from various speeches. • Identify connectives and transitions in various speeches. • Use connectives and make transitions effectively while speaking

PHONETICS LAB- TOPICS

1 **Introduction to English Phonetics:** Introduction to auditory, acoustic and articulatory phonetics. Organs of speech: the respiratory, articulatory and phonatory systems

2 **Sound System of English:** Phonetic sounds, Introduction to International Phonetic Alphabet, Classification and Description of English Phonemic sounds; Minimal pairs: The Syllable: Types of syllables; Difficulties of Indian speakers with sound of English.

3 **Rhythm and Intonation:** Introduction to rhythm and intonation; Major patterns of intonation in English with their semantic implications; difficulties of Indian speakers with sound of English.

INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

1 **Group discussion:** Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD.

2 **Debate:** Understanding the differences between a debate and a group discussion, essentials of debate, concluding a debate.

3 **Presentation Skills:** Making Effective Presentations, Expressions which can be used in Presentations, Use of Non-Verbal Communication, Coping with Stage Fright, Handling Question and Answer Session; Use of Audio-Visual Aids, PowerPoint Presentations.

4 **Public Speaking:** Advantages of public speaking, essentials of an effective speech, types of delivery, rehearsal techniques, planning and delivering a speech.

DEPARTMENT OF CIVIL ENGINEERING

ALMANAC FOR B.E - II & III year - I Semester [all branches]

S.No.	Particulars	Date
1	Commencement of Instruction	11-07-2016
2	I Class Test	29-08-2016 to 01-09-2016
3	II Class Test	26-10-2016 to 29-10-2016
4	Last date of Instruction	29-10-2016
5	Preparation holidays & Practical Examinations	31-10-2016 to 12-11-2016
6	Commencement of Theory Examinations	14-11-2016

ALMANAC FOR B.E - II & III year - II Semester [all branches]

S.No.	Particulars	Date
1	Commencement of Instruction	26-12-2016
2	I Class Test	13-02-2017 to 16-02-2017
3	II Class Test	11-04-2017 to 15-04-2017
4	Last date of instruction	15-04-2017
5	Preparation holidays & practical Examinations	17-04-2017 to 29-04-2017
6	Commencement of Theory Examinations	01-05-2017
7	Summer vacation	01-05-2017 to 08-07-2017
8	Commencement of I Semester for the Academic year 2017-2018	10-07-2017

E - JOURNALS & E-BOOKS SUBSCRIBED	
ASCE	35
ASME	27
IEEE ASPP	155
ACM Digital Library	1138
Springer Mechanical	49
Total GIST E-Journals	1405
DELNET CONSORTIUM (IESTC E-Journals -2016)	1152
DELNET E-Journals	817
Total e-journals	3374
DELNET MEMBERSHIP E-Books	335
Journals and magazines Print version	106