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WITH EFFECT FROM THE ACADEMIC YEAR 2015 – 2016

SCHEME OF INSTRUCTION & EXAMINATION

B.E. II YEAR

CIVIL ENGINEERING

SEMESTER-I

SI. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration in Hours	Maximum Marks	
			L	D/P/T		Univ. Exam	Sessi-onals
		THEORY					
1	MT 201	Mathematics-III	4	-	3	75	25
2.	CE 201	Building Planning and Drawing	-	6	3	75	25
3.	CE 202	Engineering Materials & Construction	4	-	3	75	25
4.	CE 203	Engineering Geology	4	-	3	75	25
5.	CE 204	Strength of Materials-I	4	2	3	75	25
6.	CE 205	Surveying -I	4	-	3	75	25
		PRACTICALS					
1.	CE 231	Engineering Geology Laboratory	-	3	3	50	25
2.	CE 232	Surveying -I Lab.	-	3	3	50	25
3.	CE 233	Computer Aided Civil Engineering Drafting Lab.	-	2	-	50	25
		TOTAL	20	16	-	600	225

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WITH EFFECT FROM THE ACADEMIC YEAR 2015 – 2016

SCHEME OF INSTRUCTION & EXAMINATION

B.E. II YEAR

SERVICE COURSES OFFERED TO OTHER DEPARTMENTS

SEMESTER-I

SI. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration in Hours	Maximum Marks	
			L	D/P		Univ. Exam	Sessi- onals
1.	CE 221	THEORY Mechanics of Materials (For ME, PE)	4	-	3	75	25
2.	CE 222	Environmental Studies (For EEE, IE, IT)	4	-	3	75	25
1.	CE 241	PRACTICLAS Mechanics of Materials (For ME, PE)	-	3	3	50	25

EEE Electrical &, Electronics Engg.

IE Instrumentation Engineering

IT Information Technology

ME Mechanical Engineering

PE Production Engineering

MT 201 UE

MATHEMATICS-III

(Common to all Branches)

Instruction

4 Periods per week

Duration of University Examination

3 Hours

University Examination

75 Marks

Sessional

25 Marks

Objectives:

- To introduce Laplace transforms functions of Complex Variables, the power series expansions, bilinear transformation and conformal mapping.
- To introduce and discuss various numerical methods like solving of Algebraic and Transcendental equations, interpolation, numerical differentiation, and solutions of ordinary differential equations.
- To introduce Normal and distributions, and the tests of significance, I.e t-test, F-test and test.

UNIT- I

Partial differential equations: Formation of Partial differential equations, Linear first order equations, Lagrange's equation, Non linear first order equations, Charpit's method, Standard forms.

UNIT-II

Fourier series and its applications to partial differential equations: Expansion of a function in Fourier series for a given range, Fourier series for odd and even functions, Change of interval, Half range sine and cosine series, Solution of wave equation, Heat equation and Laplace's equation by the method of separation of variables and their use in problems of vibrating string, One dimensional unsteady state heat flow and two dimensional steady state heat flow.

UNIT-III

Statistics : Introduction to Probability, Baye's theorem, Random variables, Density functions, Mathematical expectation, Expected values, Moments and Moment generating functions, Characteristic functions.

UNIT-IV

Distributions: Poisson, Normal, Gamma and Chi-Square distributions, Tests of significance, Chi-Square, F and t-tests.

UNIT-V

Curve fitting by method of least squares : Fitting of curves by the method of least squares (straight line, parabola, exponential curves), Correlation and Regression, Lines of regression.

Suggested Reading:

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1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 4th Edition, 2014.
2. Dr.B.S.Grewal, Higher Engineering Mathematics, Khanna Publications, 43rd Edition, 2014.
3. Dr.M.D.Raisinghania, Ordinary and Partial differential equations, S.CHAND, 17th Edition 2014.
4. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, 2012.
5. S.C Gupta, V.K.Kapoor, Fundamentals of Mathematical Statistics, S.CHAND & SONS.

WITH EFFECT FROM THE ACADEMIC YEAR 2015 – 2016

CE 201

BUILDING PLANNING AND DRAWING

Instruction	6 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Objectives:

- To understand different types of masonries and their applications
- To study about standard dimensions of door, windows, ventilators and other components of buildings.
- To understand the basic concepts of planning of buildings for different story heights

UNIT - I

Introduction : Scope of the subject notation used method of presentation.

Conventional Signs : Conventional representation of building elements Representation of building materials in section. Representation of 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, CRSI and II Sorts, UCRS and RR stone masonry.

UNIT - II

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

Roofs: Line diagram of simply supported roof trusses

UNIT - III

Stairs : Sketches of forms of stairs (doglegged, open well, bifurcated, etc.). Details of various RC staircases and steel spiral staircases

Foundations : Details of plan and sectional elevation of wall foundations and RC column footings

UNIT - IV

Aspects of building planning, principles of planning, details planning of one/two/three storeyed residential buildings, duplex, development of line diagrams.

UNIT - V

Drawing of Plans, elevations and sections of a single storey 1-, 2- and 3- bed room residential building.

Suggested Reading :

1. S.P. Arora and S.P. Bindra, A Text Book on Building Construction Dhanpat Rai & Sons, 1993.
2. Y.S. Shahane, Planning and Designing Building., Allies Book Stall third Edition, 2004.
3. M.G. Shah, C.M. Kalae and S.Y. Parki, Building Drawing, Tata McGraw-Hill Book Co., 2002.
4. IS 2210 : 1988 Indian Standard Criteria for Design of Reinforced Concrete Shell Structures and Folded Plates, Bureau of Indian Standards, New Delhi, 1989.

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CE 202

ENGINEERING MATERIALS AND CONSTRUCTION

Instruction

4 Periods per week

Duration of University Examination

3 Hours

University Examination

75 Marks

Sessional

25 Marks

Objectives:

- To study about the basic building materials, properties and their applications.
- To know the smart building materials, external paints and their uses.

UNIT - I

Stones: uses of stones as building materials. Characteristics of good building stones. Classification of 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 molding, drying and method of burning of bricks; clamps, intermittent and continuous kilns, Bull's trench kiln, Hoffman-s kiln. Characteristics of good building bricks, classification of bricks. Introduction to light weight bricks.

Building Blocks: Hollow building blocks for walls and roofing. Load bearing and non load bearing blocks. Provisions of IS 2572. Manufacturing process of Flyash bricks

UNIT - II

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

Blended Cements : Various type and their uses,

Fine Aggregate: Characteristics of good mortar sand, availability of sand and its classifications. Alternatives to natural sand. Bulking of sand.

Coarse Aggregate : Characteristics of good coarse aggregates for manufacture of concrete. Test on aggregates. Light weight aggregates.

UNIT - III

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

Concrete: Batching, mixing, transporting, compacting and curing, Readymix concrete.

Reinforcing steel : Types of reinforcement, specifications, storage and handling.

UNIT - IV

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

Paints, Varnish and Distemper: Constituents, characteristics of good paints, Bases, vehicles,

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thinners and colouring pigments. Painting of different types of surfaces; types of varnish, and application. Types of distemper, and application.

Emerging Building Materials : Energy conservation in buildings. Recycled materials, local materials and industrial waste products as a means of sustainable development, Glass, composites and smart materials.

UNIT-V

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

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

Plastering, Pointing and White / Color 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.

Suggested Reading :

1. Sushil Kumar, Building construction, Standard Publishers, 1992.
2. S.P. Arora and S.P. Bindra, A Text Book on Building Construction, Dhanpat Rai Publications, 2004.
3. National Building Code of India, 2005.
4. Advances in Building Materials and Construction, Central Building Research Institute, Roorkee, 2004.
5. Civil Engineering Materials, National Institute of Technical Teachers, Tata McGraw-Hill, New Delhi.

Additional Reading :

1. IS 432 : 1982, Indian Standard Specification for Mild Steel and Hard- Drawn Steel Wire for Concrete Reinforcement, Part I and II, Bureau of Indian Standards, New Delhi, 1982.
2. IS 1077 : 1992, Indian Standard Common Burnt Clay Building Bricks Specification, Bureau of Indian Standards, New Delhi, 1992.
3. IS 1786 : 1985 Indian Standard Specification for High Strength Deformed Steel Bars and Wires for Concrete Reinforcement, Bureau of Indian Standards, New Delhi, 1985.
4. IS 2117 :1991, Indian Standard Guide for Manufacture of Hand-made Common Burnt Clay Building Bricks, Bureau of Indian Standards, New Delhi, 1991.
5. IS 2248 : 1992, Indian Standard Glossary of Terms relating to Clay Products for Buildings, Bureau of Indian Standards, New Delhi, 1992.
6. IS 2572 : 1963 Indian Standard Code of Practice for Construction of Hollow Concrete Block Masonry, Bureau of Indian Standards, New Delhi, 1963.
7. IS 3495 (Parts 1 " 4): 1992, Indian Standard Method of Test for Burnt Clay Building Bricks, Bureau of Indian Standards, New Delhi, 1992.
8. IS 11650 : 1991, Indian Standard Guide for Manufacture of Common Burnt Clay Building

Bricks by Semi-Mechanised. Process, Bureau of Indian Standards, New Delhi, 1991.

9. IS 12269 :1987, Indian Standard Specifications for Grade 53 Ordinary Portland Cement, Bureau of Indian Standards, New Delhi, 1990.
10. IS 13767 : 1993, Indian Standard Burnt Clay Flash Building Bricks
_Specification, Bureau of Indian Standards, New Delhi, 1993.
11. IS 14867 : 1999, Indian Standard False Work for Concrete Structures

_Guidelines, Bureau of Indian Standards, New Delhi, 1999.

1. Sushil Kumar, Building Construction, Standard Publishers.
2. SP Arora, A Text Book of Building Construction, SP Bindra Dhanpat Rai Publications,
3. National Building Code, 2005
4. Advances in Building Materials and Construction CBRI, Roorkee, 2004.
5. Civil Engineering Materials, National Institute of Technical Teachers, Tata McGraw-Hill, New Delhi.
6. P. C. Verghese, Building Materials, PI-II Learning Pvt. Ltd.
7. B.C.Punmia, Ashok Kumar Jain, Arun Kumar Jain, Building Construction, Laxmi Publications.

CE 203

ENGINEERING GEOLOGY

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Objectives:

- To understand the engineering characteristics of different types rocks for their suitability to civil Engineering applications
- To study the concept of weathering and its engineering classification, process of formation of soil and their engineering properties
- To conceptualize the site investigation methods to know the ground condition for dam sites, tunnels and other structures

UNIT-I

Introduction: Importance of geology from Civil engineering point of view, brief study of case histories of failures, definition of minerals, importance of study of minerals, different methods of study of minerals, physical properties of minerals in identification of minerals, study of physical properties of following common rock forming minerals, feldspar, quartz, flint, olivine, Hornblend, Muscovite, Biotite, Asbestos, Chlorite, Kynite, Talc, Study of economic minerals, Pyrite Galena, Graphite, Bauxite.

Definition of rock, Geological classification of rocks, Igneous, Sedimentary and metamorphic rocks, common structures, Textures, Classifications, megascopic study of Granite, Dolerite, Basalt, Pegmatite, Laterite, Conglomerate, Sand stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT -II

Structural Geology: Strike and dip, Study of common geological structures, folds, faults, joints and unconformities.

Rock Weathering: Processes and end-products of weathering. Susceptibility of rocks to weathering, assessment of the degree of weathering.. Tests of weathering, and engineering classifications of rock weathering.

Geology of Soils: Formation of soils, nature of parent materials, relative stability of minerals, important clay minerals, geological classification, description and engineering. Types of soils and engineering importance.

Hydrogeology: Hydrologic cycle, water table, aquifers, occurrence of ground water in various geological formations. Ground water movement, springs. Ground water exploration. Ground water provinces of India.

UNIT - III

Rock Mechanics: Engineering properties of rocks. Stress-strain behaviour of rocks. Site Investigation and Geo-techniques: Geological maps, and aerial photographs, electrical resistivity and seismic refraction methods. Bore whole drilling.

UNIT -IV

Rock as Construction Material: Geological considerations in the selection of concrete aggregates, highway and Runway aggregates, building stones, decorative stones, roofing facing stones.

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 and problems of dams. Water tightness and life of reservoirs and dams.

UNIT-V

Tunnels: Purpose of Tunneling, Type of Tunnels, Stand-up time of different rocks. Engineering geological investigations of tunnels in rock; problems of tunneling, pay line and over break, logging of tunnels, and geology of some well known tunnels. Geological aspects of earthquakes, tsunamis and landslides. Introduction to GIS and applications of GIS in engineering geology.

Suggested Reading

1. F. G Bell, *Fundamentals of Engineering Geology*, Aditya Books Pvt. Ltd., New Delhi, 1992.
2. D. P. Krynine and W. R. Judd, *Principles of Engineering Geology and Geotechnics*, CBS Publishers & Distributors, First Edition, 1998.
3. K. V. G K. Gokhale, *Engineering Geology*, BS Publishers, 2005.
4. P. B. Attewell and I.W. Farmer, *Principles of Engineering Geology*, Chapman and Hall, 1976.
5. Officers of the Geological Survey of India, *Engineering Geology Case Histories*, Geological Survey of India, Miscellaneous Publication No. 29, 1975.

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WITH EFFECT FROM THE ACADEMIC YEAR 2015 – 2016

CE 204

STRENGTH OF MATERIALS - I

Instruction	4 Theory Periods per week
Duration of University Examination	2 Tutorial Periods per week
University Examination	3 Hours
Sessional	75Marks
	25Marks

Objectives:

- To understand the basic concept of stresses and strains for different materials.
- To know the mechanism of the development of shear force and bending moments in beams.
- To analyze and understand bending stress and shear stress
- To study compound stresses, direct and bending stresses in different members.
- To know the concept of torsion theory and springs

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 ration; 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 : 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, Relationships between loading, shear force and bending moment.

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

UNIT - III

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

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.

Trusses : Methods of sections and joints applied to trusses of various configurations.

UNIT - IV

Thin Cylinders: Thin Cylinder subjected to internal fluid pressure; prestressed cylinders.

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

Spherical Shells: Stresses under self-weight, uniformly distributed and crown loads.

UNIT-V

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

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 B.M. and T.M.

Introduction to graphic statics.

Suggested Reading :

1. D.S. Prakash Rao, Strength of Materials _ A Practical Approach, Universities Press, Hyderabad, 1999.
2. G.H. Ryder. Strength of Materials. Third Edition in SI units, Macmillan India Limited, Delhi, 2002.
3. A. Pytel and F.L. Singer, Strength of Materials, Harper 7 Row, fourth Edition, New York, 1987.
4. D.S. Prakash Rao, Graphical Methods in Structural Analysis, Universities Press, Hyderabad, 1997.

Additional Reading :

1. IS 516 : 1959, Indian Standard Method of Tests for strength of Concrete, Bureau of Indian Standards, New Delhi, 1959.
2. IS 1608 : 1995. Indian Standard Mechanical Testing of Metals _Tensile Testing, Bureau of Indian Standards, New Delhi, 1995.
3. IS 10 005: 1994 Indian Standard for SI Units and Recommendations for the Use of Their Multiples and Certain Other Units, Bureau of Indian Standards, New Delhi, 1994.
4. D. S. Prakash Rao, Strength of Materials Vol. /University Press.
5. Strength of Materials and Structures, John Case, Lord Chilver & Carl T F Ross, Butterworth, Heinemann Publishers.
6. Strength of Materials, S. S. Rattan, Tata McGraw Hill Education.
7. Strength of Material (Mechanics of Solids), Er. R. K. Rajput, S.Chand & Company.
8. Strength of Material (Mechanics of Solids),R. S. Khurmi, S. Chand & Company.
9. A text book of Strength of Materials, Dr. R. K. Bansal, Laxmi Publications.
10. Strength of Materials, R. Subrahmanian, Oxford University Press.
11. Strength of Materials, BS Basavarajaih & P. Maliadevappa, University Press.
12. Mechanics of Materials, B.C.Punmia.Ashok Kumar Jain, Arun Kumar Jam, Laxmi

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Publications

13. Fundamentals of Solid Mechanics, M. L. Gambhir, PHI Learning Pvt. Ltd.
14. Strength of Materials, G. H. Ryder, Macmillan Indi
15. Strength of Materials, A. Pytel and F. L. Singer Harper & Row Publishers.

CE 205

SURVEYING – I

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Objectives:

- To study the basic concepts and principles of chain survey
- To know the importance of a compass survey and its practical applications.
- To understand the basic methods and applications of plain table survey.
- To know the field applications and concepts of leveling survey.
- To study the different methods of calculation of area, contouring and measurement of volumes.

UNIT - I

Chain Survey : Principles of chain survey, use and adjustment of various instruments employed in chain survey, including optical square. Introduction to offsets. Obstructions in chaining, and chain angles. Errors and their sources. Drawing up field books. Determination of areas by chain survey.

UNIT - II

Compass Survey: Use and adjustment of prismatic and surveyor's compass. Methods of surveying with a compass. Magnetic declination, local attraction. Errors in prismatic survey. Plotting of compass survey. Distribution of closing error graphically by Bowditch Method.

UNIT - III

Plane Table Survey : Instruments employed in plane table survey. Use and adjustment of these instruments including simple alidade. Various methods of plane table survey. Three-point and two-point problems. Plane table contouring. Errors in plane table survey.

UNIT - IV

Levelling: Definitions and principles of construction of a levelling instrument, and its various parts with special reference to spirit bubble and telescope. Use and adjustment of dumpy and Auto level. Sensitivity of bubble tube. Establishment of bench marks by levelling. Longitudinal levelling. Cross-section levelling. Flying levels, and reciprocal levelling. Methods of booking and reduction of levels. Errors in leveling ; curvature and refraction corrections.

UNIT - V

Calculation of areas and volumes: Simpson's rule, and trapezoidal rule.

Contouring : Definition and characteristics of contours. Direct and indirect method Mg contouring. Uses of contours. Estimation of volumes of earthwork, and of water storage by means of contour lines and sections. Grade contours.

Suggested Reading :

1. C. Venkatramiah, A Text Book of Surveying, Universities Press, Hyderabad, 1997.
2. T.P. Kanetker and S.V. Kulkarni, Surveying and Levelling, Pune VidyarthiGruhaPrakshan,Pune,1994.
3. B.C Punmia, Surveying, Vol. I and II, Lakshmi Publications, 19M. References:

References :

1. *Fundamentals of Surveying*, S. K. Roy, PHI Learning Pvt. Ltd.
2. *Surveying Theory and Practice*. S. S. Bhavikatti, IK International Publishing House Pvt. Ltd.
4. *Surveying*, Vol.1, 2., S. K. Duggal, Tata McGraw Hill Education
5. *Surveying*, Mimi Das Saikia, Bhargab Mohan Das & Madan Mohan Das, PHI Learning Pvt. Ltd.
6. *Surveying and Leveling* Vol 1, 2,. S. S. Bhavikatti, IK International Publishing House Pvt. Ltd.
7. *Surveying and Leveling*, R. Subrahmaniam,, Oxford University Press
10. *Plane Surveying*, Alak De, S. Chand & Company.

CE 231

ENGINEERING GEOLOGY LABORATORY

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

Objectives:

- To identify and describe the physical and engineering characteristics of different types of rocks.
- To establish the ground conditions with different site investigation methods i.e areal, photographic study and VES.
- To study the geological, geotechnical, geomorphologic and hydro geological maps of India.
- To study the foundation geological maps of the case histories(major dams and tunnels) of India.

List of Experiments**Cycle -1**

1. Identification and description of physical properties of minerals.
2. Identification and description of geotechnical characteristics of rocks; IS: 1123- 1975.
3. Study of topographic maps.
4. Study of Structural Geology Models.
5. Measurement of strike and dip of joints in granites using clinometer compass.
6. Site investigation using refraction techniques (Seismic method) - field test.

Cycle-2

7. Slake durability test
8. Interpretation and drawing of sections for geological maps (folds, faults and unconformities)
9. Measurement of Electrical resistivity of rocks and soils- Field test..
10. Interpretation of Aerial Photographs using stereo scopes.
11. Study of Geological, geotechnical maps of India and Seismo-tectonic atlas.
12. Structural geology problems (strike and dip thickness and three point problems)

Note: Minimum of ten Experiments with five from each cycle to be conducted.

WITH EFFECT FROM THE ACADEMIC YEAR 2015 – 2016

CE 232

**SURVEYING-I
LABORATORY**

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

Objectives:

- To understand the basic practical applications of survey instruments.
- To Know the field measurements and field observations.
- To study and understand the different methods involved in survey field work.

List of experiments

1. Use of chain and tape and other accessories required for linear measurements.
2. Traversing by using chain and tape.
3. Application of traversing to locate a building and field objects.
4. Traversing by using compass.
5. Distance between two inaccessible points by compass survey.
6. Compass traversing and adjustment of closed traverse by Bowditch's method.
7. Plane table survey; radiation and intersection methods,
8. Two-point problem.
9. Three-point problem using trial and error method.
10. Flying levels using Dumpy Level, Auto level.
11. Auto level: Longitudinal and cross-sectioning

CE 233

COMPUTER AIDED CIVIL ENGINEERING
DRAFTING LABORATORY

Instruction	2 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

Objectives:

- To introduce Computer Aided Drafting- AutoCAD
- To understand about draw commands and edit command.
- To know about the arrays and layers.

List of Experiments

1. CAD : Introduction to Computer Aided Drafting ; features and environment.
2. Coordinates and Basic Drafting Tools : Exercises pertaining to basic building elements to illustrate the use of absolute and relative Cartesian coordinates; object tools such as snap and grid.
3. Display Commands : Drawing scale and view magnification, zooming and panning commands.
4. Creating and Editing 2-D Geometry : Creating line objects, creating circle, arc, ellipse and various polygons. Introduction to polyline. Use of editing and. modifying commands.
5. Construction Techniques : Tools to assist drafting. Creating offsets, trimming and extending of lines, and filleting of corners. Creating multiple objects through mirroring and array generation.
6. Managing Object Properties : Concept and significance of layers and its applications in building drawing. Use of different types of lines and their weightages.
7. Creating Text and Defining Styles : Exercises in adding text to a drawing. Management of text styles.
8. Introduction to Blocks : Significance of blocks in drawing. Creating blocks of common building elements and their insertion.
9. Dimensions and Hatching : Addition of dimensions to a drawing. Dimension style management. Hatching of sections; styles of hatch.
10. 2-D Single Storey building plan

Suggested Reading :

1. M.G Shah, C.M. Kale and S.Y. Patki, Building Drawing, Tata McGraw-Hill Book Co., 2002.
2. Mastering Autocad, BPB Publication, 2000.
3. K, Venguopal, Engineering Drawing and Graphics + Autocad. New Age International (P)

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Ltd., New Delhi, 1998.

4. N. Siddiquee et al, Engineering Drawing with a Primer on Autocad, Prentice Hall of India Pvt. Ltd., New Delhi, 2004.

CE 221

MECHANICS OF MATERIALS

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Objectives:

- To understand the basic concept of stresses and strains for different materials
- To know the mechanism of the development of shear force and bending moment in beams.
- To know theory of simple bending, direct and bending stresses and distribution of shear stresses.
- To study the deflections and its applications.
- To analyze and understand shear stress, torsional stress and spring applications.

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 for point loads and UDL. Relationship between intensity of loading, shear force and bending moment. Simple theory of bending. Moment of resistance. Modulus of section.

UNIT III

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

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

UNIT-IV

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-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 Rankin formulae for axial load applications. Secant and Perry formulae for eccentrically loaded columns.

Suggested Reading :

1. D. S. Prakash Rao, Strength of Materials, A Practical Approach, Universities Press, Hyderabad, 1999.
2. G H. Ryder, Strength of Materials, Third Edition in SI units, Macmillan India Limited, Delhi, 2002,
3. S. Ramamrutham, Strength of Materials, Dhanpat Rai & Sons, 1993.
4. S. S. Bhavakatti, Strength of Materials, Vikas Publications, 2003.
5. B. C, Punmia, Strength of Materials and Theory of Structures, Laxmi Publications, 1992.

CE 222

ENVIRONMENTAL STUDIES**(Common to all Branches)**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Objectives:

- To study the sources of water, floods and its impact on environment.
- To know about the ecosystem and energy resource system.
- To understand the biodiversity concepts and its advantages.
- To study different types of pollution and its impact on environment.
- To know the social and environment related issues and their preventive measures.

UNII-I

Environmental studies: Definition, scope and importance, need for public awareness. Natural resources: Water resources; use and over utilization of surface and ground water, floods, drought, conflicts over water, dam's 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 functions of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT-III

Biodiversity: Genetic species and ecosystem diversity, bio-geographical classification of India. 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 pollution, noise pollution, thermal pollution and solid waste management, Environment Protection Act; Air, water, forest and wild life acts, issues involved in enforcement of environmental legislation.

UNIT-V

Social Aspects and the Environment: Water conservation, watershed management, and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion. Environmental protection act, 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.

Suggested Reading :

1. A. K. De, Environmental Chemistry, New Age Publications, 2002.
2. E. P. Odum, Fundamentals of Ecology, W.B. Saunders Co., USA.
3. GL. Karia and R.A. Christian, Waste Water Treatment, Concepts and Design Approach, Prentice Hall of India, 2005.
4. Benny Joseph, Environmental studies, TataMcGraw-Hill, 2005
5. V. K. Sharma, Disaster Management, National Centre for Disaster Management, IPE, Delhi, 1999.

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WITH EFFECT FROM THE ACADEMIC YEAR 2015 – 2016

CE 241

MECHANICS OF MATERIALS LABORATORY

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

Objectives:

- To know and understand the experiments on various materials to assess their behavior/ limitations.
- To know the brittle and ductile material failure patterns etc, by conducting experiments.
- To understand shear force bending moment and deflections for different types of beams .
- To know the rigidity modulus by conducting spring and torsion test.

List of Experiments

Cycle -I

1. Direct tension test on metal rods
2. Young's modulus of metal specimen by direct tension test
3. Brinell's and Rockwell's hardness tests
4. Compression test
5. Impact test

Cycle - II

1. Test on a helical spring to determine the rigidity modulus.
2. Torsion test to determine the rigidity modulus of a shaft.
3. Deflection test on a cantilever beam to determine the Young's modulus
4. Deflection test on a simple beam to determine the Young's modulus
5. Deflection test on a fixed beam to determine the Young's modulus
6. Fatigue test.