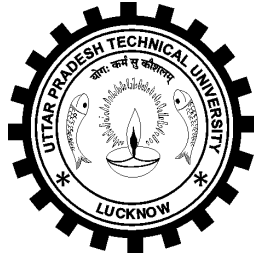


U.P. TECHNICAL UNIVERSITY, LUCKNOW



2nd Year (III & IV Sem.)

[Effective from session 2009-10]

B. Tech. Civil Engineering

U P TECHNICAL UNIVERSITY , LUCKNOW
Study & Evaluation Scheme
B Tech Civil Engineering/B.Tech. Environmental Engg.
[Effective from session 2009-10]

Second Year , III Semester

S No	Course Code	SUBJECT	PERIODS			Evaluation Scheme				Subject Total	Credit
			L	T	P	Sessional Exam			ESE		
						CT	TA	Total			
THEORY SUBJECT											
1	EME302	Strength of Material	3	1	0	30	20	50	100	150	4
2	EAS-301/EOE 031-038	Mathematics III / Science based open elective	3	1	0	30	20	50	100	150	4
3	EHU301/ EHU-302	Industrial Psychology / Industrial Sociology	2	0	0	15	10	25	50	75	2
4	ECE 301	Fluid Mechanics	3	1	0	30	20	50	100	150	4
5	ECE 302	Building Materials & Construction	4	0	0	30	20	50	100	150	4
6	ECE303	Surveying - 1	2	1	0	15	10	25	50	75	3
7	EHU111	*Human Values and Professional Ethics	2	0	0	15	10	25	50	75	-
PRACTICAL / DESIGN / DRAWING											
8	ECE351	Fluid Mech Lab	0	0	3	10	10	20	30	50	1
9	ECE352	Buildg. Materials Lab	0	0	3	10	10	20	30	50	1
10	ECE353	Surveying Lab	0	0	3	10	10	20	30	50	1
11	ECE354	Building Planning & Drawing	0	0	3	10	10	20	30	50	1
12	GP 301	General Proficiency	-	-	-	-	-	50	-	50	1
		Total	17	4	12					1000	26

U P TECHNICAL UNIVERSITY , LUCKNOW

Study & Evaluation Scheme

B Tech Civil Engineering

[Effective from session 2009-10]

Second Year , IV Semester

S No	Course Code	SUBJECT	PERIODS			Evaluation Scheme				Subject Total	Credit
			L	T	P	Sessional Exam			ESE		
						CT	TA	Total			
THEORY SUBJECT											
1	EHU402/ EHU-401	Industrial Sociology/ Industrial Psychology	2	0	0	15	10	25	50	75	2
2	EOE 041- 048 / EAS401	Science based open elective / Mathematics- III	3	1	0	30	20	50	100	150	4
3	ECE 401	Structural Analysis -1	3	1	0	30	20	50	100	150	4
4	ECE 402	Geoinformatics	3	1	0	30	20	50	100	150	4
5	ECE 403	Hydraulics & Hydraulic Machines	3	1	0	30	20	50	100	150	4
6	ECE 404	Engineering Geology	2	1*	0	15	10	25	50	75	3
7	EHU 111	*Human Values and Professional Ethics	2	0	0	15	10	25	50	75	-
PRACTICAL / DESIGN / DRAWING											
8	ECE 451	Structural Analysis Lab	0	0	3	10	10	20	30	50	1
9	ECE 452	Geoinformatics Lab	0	0	3	10	10	20	30	50	1
10	ECE 453	Hydraulics & Machine Lab	0	0	3	10	10	20	30	50	1
11	ECE 454	CBSNT Lab	0	0	3	10	10	20	30	50	1
12	GP 401	General Proficiency	-	-	-	-	-	50	-	50	1
		Total	16	5	12					1000	26

* - In this tutorial class students shall practice for mineral & rock identifications

U P TECHNICAL UNIVERSITY , LUCKNOW
Study & Evaluation Scheme
 B Tech Civil Engineering
 Effective from session 2010-11
 Third Year , V Semester

S No	Course Code	SUBJECT	PERIODS			Evaluation Scheme				Subject Total	Credit
			L	T	P	Sessional Exam			ESE		
						CT	TA	Total			
THEORY SUBJECT											
1	EHU501	Engineering & Managerial Economics	3	1	0	30	20	50	100	150	3
2	ECE501	Geotechnical Engg	3	1	0	30	20	50	100	150	4
3	ECE504	Structural Analysis -2	3	1	0	30	20	50	100	150	4
4	ECE505	Design of Concrete Structures – 1	3	1	0	30	20	50	100	150	4
5	ECE502	Transportation Engg -1	2	1	0	15	10	25	50	75	3
6	ECE503	Environmental Engg -1	2	1	0	15	10	25	50	75	3
7	EHU111	*Human Values and Professional Ethics	2	0	0	15	10	25	50	75	-
PRACTICAL / DESIGN / DRAWING											
8	ECE551	Geotechnical Engg lab	0	0	3	10	10	20	30	50	1
9	ECE552	Transportation lab	0	0	3	10	10	20	30	50	1
10	ECE553	Cad Lab – 1	0	0	3	10	10	20	30	50	1
11	ECE554	Quantity Surveying & Estimation	0	0	1	10	10	20	30	50	1
12	GP 501	General Proficiency	-	-	-	-	-	50	-	50	1
		Total	16	6	10					1000	26

Third Year , VI Semester

S No	Course Code	SUBJECT	PERIODS			Evaluation Scheme				Subject Total	Credit
			L	T	P	Sessional Exam			ESE		
						CT	TA	Total			
THEORY SUBJECT											
1	EHU601	Industrial Management	3	0	0	30	20	50	100	150	3
2	ECE602	Environmental Engg -2	3	1	0	30	20	50	100	150	4
3	ECE011- ECE014	Departmental Elective-I	2	1	0	15	10	25	50	75	2
4	ECE021- ECE024	Departmental Elective-II	3	1	0	30	20	50	100	150	4
5	ECE601	Design of Concrete Structures – 2	3	1	0	30	20	50	100	150	5
6	ECE603	Transportation Engg - 2	2	1	0	15	10	25	50	75	3
7	EHU111	*Human Values and Professional Ethics	2	0	0	15	10	25	50	75	-
PRACTICAL / DESIGN / DRAWING											
8	ECE653	Cad Lab-2	0	0	3	10	10	20	30	50	1
9	ECE652	Environmental Engg lab	0	0	3	10	10	20	30	50	1
10	ECE651	Structural Detailing Lab	0	0	3	10	10	20	30	50	1
11	ECE654	Survey Camp**			-	-	-	50	-	50	1
12	GP 601	General Proficiency	-	-	-	-	-	50	-	50	1
		Total	16	5	9					1000	26

** - This will be done during Winter Break for one week WITH THE HELP OF TOTAL STATION AND DIFFERENTIAL GPS

Note : 4 weeks Industrial Training after VI Sem. to be evaluated in VII semester.

U P TECHNICAL UNIVERSITY, LUCKNOW
Study & Evaluation Scheme
 B Tech Civil Engineering
 Effective from session 2011-12
 Final Year , VII Semester

S No	Course Code	SUBJECT	PERIODS			Evaluation Scheme				Subject Total	Credit
			L	T	P	Sessional Exam			ESE		
						CT	TA	Total			
THEORY SUBJECT											
1	EOE071- EOE074	Open Elective – I	3	1	0	30	20	50	100	150	4
2	ECE031- ECE034	Department Elective-III	3	1	0	30	20	50	100	150	4
3	ECE041- ECE044	Department Elective-IV	3	1	0	30	20	50	100	150	4
4	ECE701	Design of Steel Structures	3	1	0	30	20	50	100	150	4
5	ECE702	Water Resources Engg	3	1	0	30	20	50	100	150	4
6	EHU111	*Human Values and Professional Ethics	2	0	0	15	10	25	50	75	-
PRACTICAL / DESIGN / DRAWING											
7	ECE751	Seminar	0	0	4		-	50	-	50	1
8	ECE752	Industrial Training**					-	50	-	50	1
9	ECE753	Project#	0	0	4		-	100	-	100	3
10	GP 701	General Proficiency	-	-	-	-	-	50	-	50	1
		Total	15	5	8					1000	26

** 4 weeks Industrial Training after VI semester to be evaluated in VII semester.

Project should be initiated in VII semester beginning and should be completed by the end of VIII semester.

Final Year , VIII Semester

S No	Course Code	SUBJECT	PERIODS			Evaluation Scheme				Subject Total	Credit
			L	T	P	Sessional Exam			ESE		
						CT	TA	Total			
THEORY SUBJECT											
1	EOE081- EOE084	Open Elective – II	3	1	0	30	20	50	100	150	4
2	ECE051- ECE054	Departmental Elective-V	3	1	0	30	20	50	100	150	4
3	ECE061- ECE064	Departmental Elective-VI	3	1	0	30	20	50	100	150	4
4	ECE801	Construction Technology & Management	3	1	0	30	20	50	100	150	3
5	EHU111	*Human Value and Professional Ethics	2	0	0	15	10	25	50	75	-
PRACTICAL / DESIGN / DRAWING											
6	ECE851	Project	0	0	12		100	100	250	350	8
7	GP 801	General Proficiency	-	-	-	-	-	50	-	50	1
		Total	12	4	12					1000	24

LIST OF PROFESSIONAL / DEPARTMENTAL ELECTIVES

Departmental Elective-I

- ECE 011 - Advanced Foundation Design
- ECE 012 - Matrix Analysis of Structures
- ECE 013 - EIA and Auditing
- ECE 014 - Principles of Town Planning and Architecture

Departmental Elective-II

- ECE 021 - Advanced Concrete Design
- ECE 022 - Earth and Earth Retaining Structures
- ECE 023 - Transportation System and Planning
- ECE 024 - Rural Water Supply and Sanitation

Departmental Elective-III

- ECE 031 - Bridge Engineering
- ECE 032 - Finite Element Methods
- ECE 033 - Environmental Geotechnology
- ECE 034 - Industrial Pollution Control

Departmental Elective-IV

- ECE 041 - Precast and Modular Construction Practices
- ECE 042 - Plastic Analysis of Structures
- ECE 043 - Open Channel Flow
- ECE 044 - Tunnel Engineering

Departmental Elective-V

- ECE 051 - Computer Aided Design
- ECE 052 - Analysis and Design of Hydraulic Structures
- ECE 053 - Water Resources Systems
- ECE 054 - Machine Foundation Design

Departmental Elective-VI

- ECE061 - Ground Improvement Techniques
- ECE 062 - River Engineering
- ECE 063 - Environmental Management in Industries
- ECE 064 - Earthquake Resistant Design of Structures

List of Open Electives for B. Tech. Courses

SCIENCE BASED OPEN ELECTIVE

EOE-031 / EOE-041	Introduction to Soft Computing (Neural Networks, Fuzzy Logic and Genetic Algorithm)
EOE-032 / EOE-042	Nano Sciences
EOE-033 / EOE-043	Laser Systems and Applications
EOE-034 / EOE-044	Space Sciences
EOE-035 / EOE-045	Polymer Science & Technology
EOE-036 / EOE-046	Nuclear Science
EOE-037 / EOE-047	Material Science
EOE-038 / EOE-048	Discrete Mathematics
<u>OPEN ELECTIVE-I</u>	
EOE -071	Entrepreneurship Development
EOE-072	Quality Management
EOE-073	Operations Research
EOE-074	Introduction to Biotechnology
<u>OPEN ELECTIVE-II</u>	
EOE-081	Non Conventional Energy Resources
EOE-082	Nonlinear Dynamic Systems
EOE-083	Product Development
EOE-084	Automation & Robotics

EME 302 Strength of Materials

L T
3 1

UNIT-I

Compound stress and strains: Introduction, state of plane stress, Principal stress and strain, Mohr's stress circle. 3

3-D Stress, Theory of failure, Castiglione's Theorem, Impact load: Three-dimensional state of stress & strain, equilibrium equations. Generalized Hook's Law. Theories of Failure. Castiglione's Theorem. Impact load & stresses. 5

UNIT –II

Stresses in Beams: Review of pure Bending. Direct and shear stresses in beams due to transverse and axial loads, composite beams. 2

Deflection of Beams: Equation of elastic curve, cantilever and simply supported beams, Macaulay's method, area moment method, fixed and continuous beams. 4

Torsion: Review of Torsion, combined bending & torsion of solid & hollow shafts. 2

UNIT-III

Helical and Leaf Springs: deflection of springs by energy method, helical springs under axial load and under axial twist (respectively for circular and square cross sections) axial load and twisting moment acting simultaneously both for open and closed coiled springs, laminated springs. 4

Columns and Struts: Combined bending and direct stress, middle third and middle quarter rules. Struts with different end conditions. Euler's theory and experimental results, Ranking Gardon Formulae, Examples of columns in mechanical equipments and machines. 4

UNIT-IV

Thin cylinders & spheres: Hoop and axial stresses and strain. Volumetric strain. 2

Thick cylinders: Radial, axial and circumferential stresses in thick cylinders subjected to internal or external pressures, Compound cylinders. Stresses in rotating shaft and cylinders. Stresses due to interference fits. 5

UNIT-V

Curved Beams: Bending of beams with large initial curvature, position of neutral axis for rectangular, trapezoidal and circular cross sections, stress in crane hooks, stress in circular rings subjected to tension or compression. 4

Unsymmetrical Bending: Properties of beam cross-section, slope of neutral axis, stress and deflection in unsymmetrical bending, determination of shear center and flexural axis (for symmetry about both axis and about one axis) for I-section and channel-section. 4

Books :

1. Mechanics of Materials by Pytel

2. Strength of Materials by Ryder
3. Strength of Materials by Timoshenko and Youngs
4. Mechanics of Materials by Bear Jhonson

ECE 301 FLUID MECHANICS

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3 1

Unit - I

Fluid and continuum, Physical properties of fluids, Rheology of fluids. Pressure-density-height relationship, manometers, pressure transducers, pressure on plane and curved surfaces, centre of pressure, buoyancy, stability of immersed and floating bodies, fluid masses subjected to linear acceleration and uniform rotation about an axis.

Unit - II

Types of fluid flows: Continuum & free molecular flows. Steady and unsteady, uniform and non-uniform, laminar and turbulent flows, rotational and irrotational flows, compressible and incompressible flows, subsonic, sonic and supersonic flows, sub-critical, critical and supercritical flows, one, two and three dimensional flows, streamlines, continuity equation for 3D and 1D flows, circulation, stream function and velocity potential, source, sink, doublet and half-body.

Unit - III

Equation of motion along a streamline and its integration, Bernoulli's equation and its applications- Pitot tube, orifice meter, venturi meter and bend meter, Hot-wire anemometer and LDA, notches and weirs, momentum equation and its application to pipe bends. Dimensional analysis, Buckingham's Pi theorem, important dimensionless numbers and their significance, geometric, kinematics and dynamic similarity, model studies.

Unit - IV

Equation of motion for laminar flow through pipes, Stokes' law, transition from laminar to turbulent flow, turbulent flow, types of turbulent flow, isotropic, homogenous turbulence, scale and intensity of turbulence, measurement of turbulence, eddy viscosity, mixing length concept and velocity distribution in turbulent flow over smooth and rough surfaces, resistance to flow, minor losses, pipe in series and parallel, power transmission through a pipe, siphon, water hammer, three reservoir problems and networks.

Unit - V

Boundary layer thickness, boundary layer over a flat plate, laminar boundary layer, application of momentum equation, turbulent boundary layer, laminar sub-layer, separation and its control, Drag and lift, drag on a sphere, a two dimensional cylinder, and an aerofoil, Magnus effect.

References :

1. S Narasimhan : First Course in Fluid Mechanics , University Press
2. Som, S.K. & Biswas G. : Introduction of fluid mechanics & Fluid Machines, TMH, 2000, 2nd edition.
3. M M Das : Fluid Mechanics & Turbomachines , Oxford University Press
4. S.K.Agarwal : Fluid Mechanics & Machinery, TMH

5. Garde, R.J., "Fluid Mechanics through Problems", New Age International Pvt. Ltd, New Delhi, 2nd Edition.
6. Hunter Rouse, "Elementary Mechanics of Fluids", John Wiley & Sons. Omc. 1946
7. I.H.Shames, "Mechanics of Fluids", McGraw Hill, Int. Student, Education, 1988.
8. Fluid Mechanics by K L Kumar
9. Vijay Gupta and S.K.Gupta, " Fluid Mechanics and its Applications", Wiley Eastern Ltd, 1984.
10. Modi, P.N., and Seth, S.H., "Hydrualics and Fluid Machines", Standard Book House, 1989.

ECE 302 Building Materials & Construction

L T
4 0

Unit - 1

Classification of materials, materials and their performance, economics of the building materials.

Stones, Requirement of good building stone, characteristics of stones and their testing. Common building stones. Preservation of stones.

Bricks : Manufacture of clay bricks, and their classification. Properties of clay bricks and their testing. Problems of efflorescence & lime bursting in bricks & tiles.

Gypsum : properties of gypsum plaster, building products of gypsum and their uses.

Lime : Manufacture of lime, classifications of limes, properties of lime.

Pozzolona : Natural and Artificial fly ash, Surkhi (burnt clay pozzolona), rice husk and ash pozzolona, properties and specifications for use in construction.

Timber : Classification and identification of timber, Fundamental Engineering properties. Defects in timber, Factors affecting strength of timber, seasoning and preservation of timber. Wood based products.

Asphalt, Bitumen and Tar : Terminology, specifications and uses, Bituminous materials.

Unit - II

Chemistry of Plastics manufacturing process, classification, advantages of plastics, Mechanical properties and their use in construction.

Paints varnishes and distempers, Common constituents, types and desirable properties, Cement paints.

Ferrous metals, Desirable characteristics of reinforcing steel. Principles of cold working. Detailed Discussion on reinforcing steel mechanical and physical properties chemical composition. Brief discussion on properties and uses of Aluminum and lead.

Glass : Ingredients, properties types and use in construction.

Insulating Materials : Thermal and sound insulating material desirable properties and type.

Unit - III

Components of building area considerations, Construction Principle and Methods for layout, Damp proofing ant termite treatment, Vertical circulation means staircases ramp design and construction.

Different types of floors, and flooring materials (Ground floor and upper floors).

Bricks and stone masonry construction. Cavity wall hollow block and Waffle slab construction.

Unit - IV

Doors, Windows and Ventilations, Construction details types and relative advantages & disadvantages. Roofs types and treatments, Lintels and Chhajja Functional efficiency of Buildings.

Unit - V

Natural Ventilation , Water Supply and Sanitary fittings (Plumbing), Electricity. Heating Ventilation & Air conditioning , Mechanical Lifts and Escalators , Fire Fighting , Acoustics.

Plastering different types, pointing, Distempering, Colour washing, Painting etc. Principles & Methods of building maintenance

References

1. S K Duggal : Building Materials , New Age International
2. P.C. Varghese : Building Materials , PHI
3. P.C. Varghese : Building Construction , PHI
4. B.C. Funmia : A Text Book of Building Construction, Luxmi Publications, Delhi.
5. O.H. Koenisberger : "Manual of tropical housing and building" Orient Longman
6. S.P. Arora et al., "A Text Book of Building Construction - Dhanpat Rai & Sons,

ECE 303 Surveying-I

L	T
2	1

Unit - I

Importance of surveying to engineers, plane and geodetic surveying, principles of surveying, classification of surveys **(2)**

Principles of different methods and their accuracies, measurement by tape, Reference meridians, bearing and azimuths, magnetic declination, compass, Vernier theodolite, temporary adjustments, measurements of horizontal angle, modern trends- EDM, electronic theodolites and Electronic Total Station. **(4)**

Unit - II

Methods of determining elevations, Direct levelling- basic terms and definitions, principle, booking and reduction of field notes, curvature and refraction, automatic levels, Contouring- methods and uses **(4)**

Definition, Principles of stadia systems, subtense bar and tangential methods **(2)**

Unit - III

Elements of simple circular curves, theory and methods of setting out simple circular curves, transition curves- types and their characteristics, ideal transition curve, equations of various transition curves, Introduction to vertical curves **(5)**

Unit - IV

Principles of traversing by compass and theodolite, computations of traverse coordinates, Principles and classification of triangulation systems, strength of figures, satellite stations, intervisibility of stations, triangulation field work **(5)**

Principles, plane table equipments, methods, resection by three point problem **(2)**

References

1. S K Duggal : Surveying Vol 1 & 2 , TMH
2. R Subramanian : Surveying & Leveling , Oxford University Press
3. B C Punamia : Surveying & Leveling
4. C Venkatramaih : Text Book of Surveying , University Press
5. H . Kanitkar : Surveying & Levelling

ECE 351 FLUID MECHANICS LAB

L T P
0 0 3

1. To verify the momentum equation using the experimental set-up on impact of jet.
2. To determine the coefficient of discharge of an orifice of a given shape. Also to determine the coefficient of velocity and the coefficient of contraction of the orifice mouth piece.
3. To calibrate an orifice meter, venturimeter, and bend meter and study the variation of the co-efficient of discharge with the Reynolds number.
4. To study the transition from laminar to turbulent flow and to determine the lower critical Reynolds number.
5. To study the velocity distribution in a pipe and also to compute the discharge by integrating the velocity profile.
6. To study the variation of friction factor, 'f' for turbulent flow in commercial pipes.
7. To study the boundary layer velocity profile over a flat plate and to determine the boundary layer thickness.
8. Verification of meta-centric height

ECE-352 BUILDING MATERIALS LAB

L T P
0 0 3

- I. Cement (Two turns only)
 1. Normal Consistency of cement.
 2. Initial & final setting time of cement
 3. Compressive strength of cement
 4. Fineness of cement by air permeability and Le-chatalier's apparatus.
 5. Soundness of cement.
 6. Tensile strength
- II. Coarse Aggregate (Two turns only)
 1. Crushing value of aggregate
 2. Impact value of aggregate
 3. water absorption of aggregate
 4. Sieve Analysis of Aggregate
 5. Specific gravity & bulk density
 6. Grading of aggregates.
- III Fine Aggregate : (one turn only)
 1. Sieve analysis of sand
 2. Silt content of sand
 3. Bulking of sand

- IV Destructive and non destructive testing on concrete
- V Physical and mechanical properties of reinforcing steel.
- VI Bricks:
 - 1. Water absorption.
 - 2. Dimension Tolerances
 - 1 Compressive strength
 - 4. Efflorescence

ECE 353 SURVEY FIELD WORK

L T P
0 0 3

1. Study of different types of topographical maps and to prepare conventional symbols chart.
2. To measure bearings of a closed traverse by prismatic compass and to adjust the traverse by graphical method.
3. To find out reduced levels of given points using dumpy/Auto level.
4. To perform fly leveling with a Auto /tilting level.
5. To study parts of a vernier / Electronic theodolite and practice for taking angle measurements.
6. To measure vertical angle of given points by Electronic theodolite.
7. To measure horizontal angle between two objects by repetition method with three repetitions.
8. To measure horizontal angle by method of reiteration
9. To determine the elevation of chimney top by trigonometrical levelling by taking observations in single vertical plane.
10. To set out a simple circular curve by Rankine's method
11. To study various parts and practice with Wild T-2 micro-optic theodolite and EDM (Distomat DI-1600).

ECE-354 BUILDING PLANNING & DRAWING LAB.

L T P
0 0 3

Drafting of following Using Any CAD software

1. Symbols used in Civil Engineering drawing , Masonry Bonds
2. Doors, Windows and staircases.
3. Plumbing & Electrical fitting drawing.
4. Comprehensive Drawing of Residential building (Layout, plan, elevation & sectional elevation, plumbing & electrical fillings in out)
5. Preparation of Layout planning of different civil engg. Projects.
7. Preparation of lay out plan/Maps and building drawing using computer

ECE-401 STRUCTURAL ANALYSIS –I

L T P
3 1 0

Unit –I :

Classification of Structures, stress resultants, degrees of freedom per node, Static and Kinematic determinacy. [03]

Classification of Pin jointed determinate trusses, Analysis of determinate plane and space trusses (compound and complex). Method of Substitution and Method of tension coefficient. [05]

Unit – II

Rolling loads, influence lines for beams and trusses, Absolute maximum bending moment, Muller-Breslau's principal & its application for determinate structures [08]

Unit – III

Analysis of Arches, Linear arch, Eddy's theorem, three hinged parabolic arch, spandrel braced arch, moving load & influence lines. [08]

Unit – IV

Strain Energy of deformable systems, Maxwell's reciprocal & Betti's theorem, Castigliano's first theorem, unit load & Conjugate beam methods. [08]

Unit – V

Unsymmetrical bending, location of neutral axis, computation of stresses and deflection, Shear Centre its location for common structural section. [05]

Bending of curved bars in plane of bending, stresses in bars of small & large initial curvatures. [03]

References

1. Hibbler ,” Structural Analysis “, Pearson Education
2. T S Thandavmorthy ,” Analysis of Structures “, Oxford University Press
3. Wilbur and Norris, “Elementary Structural Analysis”, Tata McGraw Hill.
4. Reddy, C.S., “Basic Structural Analysis”, Tata McGraw Hill.
5. Jain, O.P. and Jain, B.K., “Theory & Analysis of Structures ”. Vol. I & II Nem Chand.
6. Vazirani & Ratwani et al ,” Analysis of Structures “ , Khanna Publishers
7. Coates, R.C., Coutie, M.G. & Kong, F.K., “Structural Analysis”, English Language Book Society & Nelson, 1980.

ECE 402 Geoinformatics

L	T	P
3	1	0

Unit - I

Aerial Photographs- Basic terms & Definitions, scales, relief displacements, Flight Planning, Stereoscopy, Characteristics of photographic images, Fundamentals of aerial photo-interpretation

Unit - II

Physics of remote sensing, Ideal remote sensing system, Remote sensing satellites and their data products, Sensors and orbital characteristics, Spectral reflectance curves, resolution and multi-concept, FCC

Unit - III

Satellite Image - Characteristics and formats, Image histogram, Introduction to Image rectification, Image Enhancement, Land use and land cover classification system, Supervised Classification, Applications of remote sensing

Unit - IV

Basic concepts of geographic data, GIS and its components, Data acquisition, Raster and Vector formats, topology and Data models, Spatial modelling, Data output, GIS Applications

Unit - V

Introduction, Satellite navigation System, GPS- Space segment, Control segment, User segment, GPS satellite signals, Receivers, Static, Kinematic and Differential GPS

References

1. A M Chandra : Higher Surveying
2. B C Punamia : Surveying & Leveling , Vol 2
3. M Anjireddy : Remote Sensing & GIS , BS Publications
4. T M Lillesand et al: Remote Sensing & Image Interpretation , Wiley India , 5 th
5. A M Chandra : Remote Sensing & GIS , Narosa
6. S K Duggal : Surveying Vol 2 , TMH
7. N K Agarwal : Essentials of GPS , Spatial Networks: Hyderabad.

ECE 403 Hdraulics & Hydraulic Machines

L	T	P
3	1	0

Unit - I

Difference between open channel flow and pipe flow, geometrical parameters of a channel, continuity equation.

Critical depth, concepts of specific energy and specific force, application of specific energy principle for interpretation of open channel phenomena, flow through vertical and horizontal contractions.

Unit - II

Chezy's and Manning's equations for uniform flow in open channel, Velocity distribution, most efficient channel section.

Unit - III

Equation of gradually varied flow and its limitations, flow classification and surface profiles, integration of varied flow equation by analytical, graphical and numerical methods, flow in channels of non-linear alignment

Unit - IV

Classical hydraulic jump, evaluation of the jump elements in rectangular and non-rectangular channels on horizontal and sloping beds, open channel surge, celerity of the gravity wave, deep and shallow water waves.

Unit - V

Rotodynamic pumps, classification on different basis, basic equations, Velocity triangles, manometric head, efficiencies, cavitation in pumps, characteristics curves.

Introduction, Rotodynamic Machines, Pelton Turbine, equations for jet and rotor size, efficiency, spear valve, reaction turbines, Francis and Kaplan type, Head on reaction turbine, unit quantities, similarity laws and specific speed, cavitation, characteristic curves.

References :

1. Garde,R.J., “ Fluid Mechanics through Problems”, New Age International
2. Streeter, V.L. and White, E.B., “Fluid Mechanics”, McGraw Hill, New York, 8th
3. Asawa,G.L., “Experimental Fluid Mechanics”, Vol.1, NemChand and Bros.,
4. Ranga Raju, K.G., Flow through open channels, T.M.H. 2nd edition
5. Rajesh Srivastava , Flow through Open Channels , Oxford University Press
6. Subramanya , Flow through Open Channels , TMH
7. Vasandani , Hydraulic Machines

ECE 404 ENGINEERING GEOLOGY

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1. Minerals : Their physical and detailed study of certain rock forming minerals.
2. Rocks : Their origin, structure, Texture and classification of igneous sedimentary and metamorphic rocks and their suitability as Engg. materials.
3. Stratification, Lamination bedding. Outcrop-its relation to topography, dip and strike of bed, overlap, outlier and inlier.
4. Rock deformation : Folds, Faults, joints unconformity and their classification, causes and relation to engg. Behaviour of rock masses.
5. Earthquake, its causes, classification, seismic zones of India and Geological consideration for construction of building, projects in seismic areas.
6. Landslides, its causes, classification and preventive measures.
7. Underground water, Origin, Aquifer, Aquicludes, Artesian Wells, underground provinces of India and its role as geological hazard.
8. Building Stones Engg. properties of rocks, Alkali aggregate reaction, Grouting, Pozzolonic materials.
9. Geological investigations for site selection of Dams and reservoirs tunnels, bridges and Highways.

10. Principles of Geophysical explorations methods for subsurface structures.

Reference Books

1. Tony Waltham : Fundamentals of Engineering Geology ,SPON Press
2. J.M. Treteth : Geology of Engineers, Princeton, Von. Nostrand.
3. K V G K Gokhale , Text Book of Engineering Geology , B S Publication
4. Prabin Singh : Engg. and General Geology, Katson Publishing House.
5. Blyth F.G.M. : A Geology for Engineers, Arnold, London.
6. D.S. Arora : Geology for Engineers, Mohindra Capital Publishers, Chandigarh.
7. F G Bell : Funamentals of Engineering Geology , B S Publication
8. Leggot, R.F. : Geology and Engineering, McGraw Hill, New York.
9. P.K. Mukerjee : A text Book of Geology, Calcutta Word Publishers.
10. B S Sathya narayanswami, “ Engineering Geology”, Dhanpat Rai & Co

ECE-451 STRUCTURAL ANALYSIS LAB

L T P
0 0 3

1. To determine Flexural Rigidity (EI) of a given beam
2. To verify Maxwell's Reciprocal theorem.
3. To find horizontal thrust in a three-hinged arch and to draw influence line diagrams for Horizontal Thrust end Bending moment.
4. To find horizontal thrust in a two hinged arch and to draw influence line diagrams for horizontal Thrust and bending moment.
5. To find deflection of curved members.
6. To find bar forces in a three members structural frames with pin jointed bar
7. To find Critical load in Struts with different end conditions.
8. To find deflections in Beam having unsymmetrical bending.

ECE 452 GEOINFORMATICS LAB

L T P
0 0 3

- 1, 2 Demonstration and working on Electronic Total Survey Station (TC-1800)
- 3.
- 4, 5. To layout a precise traverse in a given area and to compute the adjusted coordinates of survey stations
- 6,7 Demonstration and working with Pocket/ Mirror stereoscopes, Parallax bar and Aerial photographs
- 8 Visual Interpretation using IRS false colour composite
9. Demonstration and practice work with hand held GPS (GS-5).

ECE 453 Hydraulics & Hydraulic Machines LAB

L T P
0 0 3

1. To determine the Manning's coefficient of roughness 'n' for the bed of a given flume.
2. To study the velocity distribution in an open channel and to determine the energy and momentum correction factors
3. To study the flow characteristics over a hump placed in an open channel.
4. To study the flow through a horizontal contraction in a rectangular channel.
5. To calibrate a broad-crested weir.
6. To study the characteristics of free hydraulic jump.
7. To study rotodynamic pumps and their characteristics
8. To study characteristics of any two turbines (Francis/ Kaplan / Pelton)

ECE 454 COMPUTER BASED STAISTICAL & NUMERICAL TECHNIQUES LAB

L T P
0 0 3

Write Programs in 'C' Language:

1. To Find out the root of the Algebraic and Transcendental equations using Bisection, Regula-falsi, Newton Raphson and Iterative Methods. Also give the rate of convergence of roots in tabular form for each of these methods.
2. To implement Newton's Forward and Backward Interpolation formula.
3. To implement Gauss Forward and Backward, Bessel's, Sterling's and Evertt's Interpolation formula
4. To implement Numerical Differentiations & Integration
5. To implement Least Square Method for curve fitting.
6. Computation of central tendencies, coefficient of variance and skewness
7. Linear correlation and regression