EDP/18/3030
31/8/18

DFOE/18/31
05/09/18

Most urgent

Chaudhary Devi Lal University
Sirsa, Haryana, Pin- 125055, (India)

Paper Assessment Scheme

For

Under Graduate Course,
For 4 Year(s) Bachelor Degree Program in

Faculty of Physical Science

Bachelor of Technology(B.Tech.)
(Credits System)

(w.e.f. 2017-18-Regular)
Civil Engineering
Course Code:

May be forwarded to Dean, Faculty of Engg. for unification, Pl
Supdt EDP
I/c EDP

Dean Faculty Engg.)

—01—

Sem -IV

Paper Name: Structural Analysis-I
Paper Code: CVE-201-L Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Lectures	5	4.00	Theory	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: STRUCTURAL ANALYSIS-I Lab
Paper Code: CVE-201-P Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Practical	2	1.00	Practical	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: Fluid Mechanics-I
Paper Code: CVE-203-L Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Lectures	4	3.50	Theory	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: FLUID MECHANICS-I Lab
Paper Code: CVE-203-P Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Practical	2	1.00	Practical	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: Surveying-I
Paper Code: CVE-205-L Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Lectures	4	3.50	Theory	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: SURVEYING-I Lab
Paper Code: CVE-205-P Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Practical	3	1.50	Practical	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: ENGINEERING GEOLOGY
Paper Code: CVE-207-L Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Lectures	4	3.50	Theory	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: BUILDING CONSTRUCTION, MATERIALS & DRAWING
Paper Code: CVE-209-L Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Lectures	5	4.00	Theory	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: SKILLS AND INNOVATION LAB
Paper Code: CVE-211-P Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Practical	3	0.00	Practical	40	100	EA	28	70	Marks System
						IA	12	30	Marks System

Paper Name: Environmental Studies
Paper Code: EVS-201-L Min: -- Max: 100

TLM	Hrs	Credits	AM	Min	Max	AT	Min	Max	Evaluation System
Lectures	3	3.00	Theory	40	100	EA	23	70	Marks System
						IA	12	30	Marks System

Course Part: S.Y.B.Tech.

Term: Sem-III

The papers for S.Y.B.Tech. - Sem-III are classified into following groups:

1.Core Group (Min Papers: 10, Max Papers: 10,
Separate Passing Head: No, Max. Marks: 0)
Select minimum 10 paper(s)
Select maximum 10 paper(s)
Papers:

EVS-201-L	Environmental Studies
CVE-201-L	Structural Analysis-I
CVE-203-L	Fluid Mechanics-I
CVE-205-L	Surveying-I
CVE-207-L	ENGINEERING GEOLOGY
CVE-209-L	BUILDING CONSTRUCTION, MATERIALS & DRAWING
CVE-201-P	STRUCTURAL ANALYSIS-I Lab
CVE-203-P	FLUID MECHANICS-I Lab
CVE-205-P	SURVEYING-I Lab
CVE-211-P	SKILLS AND INNOVATION LAB

- 03 ✓

Suitability and stability of foundation sites and abutments:
Geological condition and their influence on the selection, location, type and design of dams, reservoirs, tunnels, highways, bridges etc. Landslides and Hill-slope stability.

Unit-IV

Improvement of foundation rocks:
Precaution and treatment against faults, joints and ground water, retaining walls and other precautions.
Geology and environment of earth.

TEXT BOOK:

1. A Text Book of Geology by P.K. Mukherjee

REFERENCE BOOKS:

1 Physical and General Geology by S.K.Garg
2 Engineering and General Geology by Prabin Singh
3 Introduction of Physical Geology by A.Holmes.

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BUILDING CONSTRUCTION, MATERIALS & DRAWING

Course Code: CVE 209-F Course Credits: 4.0 Mode: Lecture(L) and Drawing(D) Type: Compulsory Contact Hours: 3 hours (L) + 02 hours (D) per week Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: Student should have prior knowledge of basic fundamental properties of the material used in the construction industry.

Objectives:

- The objective of this course is to provide sufficient knowledge about various building materials along with their advantages in construction industry.
- To explore the material available and their properties for the treatment required at the time of construction.
- To study about the material and their properties required as finishing.

Course outcomes:

CO-1 Knowledge of components of structure under construction by different material with their advantages and disadvantages.

CO-2 Learn about the different material required in the interior of a structure to make the structure safe and sound.

CO-3 Compatible with the information about the bonding agents such as cement etc.

CO-4 Information about timber, metals, plastic, paints and varnishes along with their properties.

Unit-I

A. CONSTRUCTION

Masonry Construction:

Introduction, various terms used, stone masonry-Dressing of stones, Classifications of stone masonry, safe permissible loads, Brick masonry-bonds in brick work, laying brick work, structural brick work-cavity and hollow walls, reinforced brick work, Defects in brick masonry, composite stone and brick masonry, glass block masonry.

Cavity and Partition Walls:

Advantages, position of cavity, types of non-bearing partitions, constructional details and precautions, construction of masonry cavity wall.

Foundation:

Functions, types of shallow foundations, sub-surface investigations, geophysical methods, general feature of shallow foundation, foundations in water logged areas, design of masonry wall foundation, introduction to deep foundations i.e. pile and pier foundations.

Unit-II

Damp-Proofing and Water-Proofing:

Defects and causes of dampness, prevention of dampness, materials used, damp-proofing treatment in buildings, water proofing treatment of roofs including pitched roofs.

Roofs and Floors:

Types of roofs, various terms used, roof trusses-king post truss, queen post truss etc.

Floor structures, ground, basement and upper floors, various types of floorings.

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STRUCTURAL ANALYSIS-I Lab

Course Code: CVE 201-P Course Credits: 1 Type: Compulsory Contact Hours: 2 hours per week. Mode: Practical session	**Course Assessment Methods (Internal: 30; External: 70)** Internal continuous assessment of 30 marks on the basis of class performance and attendance in practical classes. For the end semester practical examination the assessment will be done out of 70 marks by the external and internal examiners

Prerequisite: Student should have prior knowledge of reading the equipments with accuracy.

Objectives:

- The objective of this course is to study and verify the theoretical values with the experimental values.
- To study the behavior of different types of structures under loading.
- To help students to build the foundation for different ways of structural analysis.

Course outcomes:

CO-1 Basic application of mechanics involved commonly in the structures.
CO-2 Get the desired values of the resultant action in response to the agitation on the structures.
CO-3 Various techniques to analyse the structures following the slope and deflection approach.
CO-4 Analysis of trusses or forces in each member of trusses using simplified approach.

LIST OF EXPERIMENTS:

1. Verification of reciprocal theorem of deflection using a simply supported beam.
2. Verification of moment area theorem for slopes and deflections of the beam.
3. Deflections of a truss- horizontal deflection & vertical deflection of various joints of a pin- jointed truss.
4. Elastic displacements (vertical & horizontal) of curved members.
5. Experimental and analytical study of 3 hinged arch and influence line for horizontal thrust.
6. Experimental and analytical study of behavior of struts with various end conditions.
7. To determine elastic properties of a beam.
8. Uniaxial tension test for steel (plain & deformed bars)
9. Uniaxial compression test on concrete & bricks specimens.

Note: At-least seven experiments are to be performed by students from the above list. The course coordinator may also design and set experiments in addition to the above list/topic as per the scope and requirement of syllabus.

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Tacheometry:

Uses of tacheometry, principle of tacheometric surveying, instruments used in tacheometry, systems of tacheometric surveying-stadia system fixed hair method, determination of tacheometric constants, tangential systems, examples.

Unit-IV

Curves:

Classification of curves, elements of simple circular curve, location of tangent points-chain and tape methods, instrumental methods, examples of simple curves. Transition Curves-Length and types of transition curves, length of combined curve, examples.

Vertical Curves: Necessity and types of vertical curves.

TEXT BOOK:

1 Surveying Vol.I & II by B.C.Punmia
2 Surveying by C. Venkatramaiah

REFERENCE BOOKS:

1 Surveying Vol.I by T.P.Kanitkar
2 Fundamentals of Surveying by S. K. Roy
3 Surveying and levelling by R. Subramaniam

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ENGINEERING GEOLOGY

rse C — ode: CVE 207-L arse — redits: 3.5 de. L — ecture(L) and Tutorial(T) pe C — mpulsory ntac t — Hours: 3 hours (L) + 01 hour (T) we — k. mi n za tion Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

uisite: Student should have prior knowledge of basic Earth structure and its composition.

ives:

The objective of this course is to provide sufficient knowledge of resources and reserves and their uses.
To understand and provide the effective solutions to geotechnical field problems.
To help to understand the geological features of the area for construction onshore and offshore.

se outcomes:

To understand the danger of erosion, earthquake and volcano eruption etc.
2 Able to understand the interior of Earth formation and type of the rocks in its layers.
3 Behaviour of soil and water retaining structures with the knowledge of Landslides and hill stability.
4 Study of treatment of faults, joints, ground water and geological importance of earth structure.

t-I

oduction:

inition, object, scope and sub division of geology, geology around us. The interior of the earth. Importance eology in Civil Engineering projects.

ysical Geology:

e external and internal geological forces causing changes, weathering and erosion of the surface of the earth. ological work of ice, water and winds. Soil profile and its importance. Earthquakes and volcanoes.

it-II

ineralogy and Petrology:

efinition and mineral and rocks. Classification of important rock forming minerals, simple description based n physical properties of minerals. Rocks of earth surface, classification of rocks. Mineral composition, extures, structure and origin of Igneous, Sedimentary and Metamorphic rocks. Aims and principles of ratigraphy. Standard geological/stratigraphical time scale with its sub division and a short description based on ngineering uses of formation of India.

tructural Geology:

orms and structures of rocks. Bedding plane and outcrops Dip and Strike. Elementary ideas about fold, fault, oint and unconformity and recognition on outcrops. Importance of geological structures in Civil Engineering projects.

Unit-III

Applied Geology:

Hydrogeology, water table, springs and Artesian well, aquifers, ground water in engineering projects. Artificial recharge of ground water, Elementary ideas of geological investigations. Remote sensing techniques for geological and hydrological survey and investigation. Uses of geological maps and interpretation of data, geological reports.

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Revised Scheme B.Tech. (Civil Engineering) wef 2016-17 Batch 2nd year

SEMESTER-3

	Course Code	Course Name	L	T	P/D	Credits
ES-6	EVS-201-L	Environmental Studies	3	-	-	3
PC-1	CVE-201-L	Structural Analysis-I	3	2	-	4.0
PC-2	CVE-203-L	Fluid Mechanics-I	3	1	-	3.5
PC-3	CVE-205-L	Surveying-I	3	1	-	3.5
PC-4	CVE-207-L	Engineering Geology	3	1	-	3.5
PC-5	CVE-209-L	Building Construction, Materials & Drawing	3	-	2	4.0
	CVE-201-P	Structural Analysis-I Lab	-	-	2	1
	CVE-203-P	Fluid Mechanics-I Lab	-	-	2	1
	CVE-205-P	Surveying-I Lab	-	-	3	1.5
MC-3 (Non Credit)	CVE-211-P	Skills & Innovation Lab (2 Unit)	-	-	3	-
	Total					25

SEMESTER-4

	Course Code	Course Name	L	T	P/D	Credits
HS-4	HUM-201-L	Fundamentals of Management	3	-	-	3
BS-6	MAT-201-L	Mathematics-III	3	1	-	3.5
PC-6	CVE-202-L	Structural Analysis-II	3	2	-	4.0
PC-7	CVE-204-L	Fluid Mechanics-II	3	2	-	4.0
PC-8	CVE-206-L	Soil Mechanics	3	1	-	3.5
PC-9	CVE-208-L	Surveying-II	3	1	-	3.5
	CVE-204-P	Fluid Mechanics-II Lab	-	-	2	1
	CVE-206-P	Soil Mechanics Lab	-	-	2	1
	CVE-208-P	Surveying-II Lab	-	-	3	1.5
MC-4 (Non Credit)	PSY-201-L	Personality Development (2 Unit)	2	1	-	-
	Total					25

Note: The students shall devote 3 - 4 weeks to Survey Camp after 4th Semester Examination. The evaluation of survey camp will be taken up in the 5th semester.

24/7/17 24/7/17 24/7/17 24/07/17 24/7/17 Dean (FST)

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Environmental Studies

Course Code: EVS-201-L Course Credits: 3 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 01 hour (T) per week. Examination Duration: 03 hours.	Course Assessment Methods (Internal: 30; External: 70) Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: Student should have prior knowledge of basic environment science.

Objectives:

- To enhance knowledge skills and attitude to environment.
- To understand natural environment and its relationship with human activities.

Course outcomes:

CO-1 Students will be able to enhance and analyze human impacts on the environment.
CO-2 Integrate concepts & methods from multiple discipline and apply to environmental problems.
CO-3 Design and evaluate strategic terminologies and methods for sustainable management of environmental systems.
CO-4 Field studies would provide students first-hand knowledge on various local environment aspects which forms an irreplaceable tool in the entire learning process.

Unit-I

Multidisciplinary nature of Environmental studies: Definition, scope and importance, need for public awareness; Concept, Structure and function of an ecosystem. Producers, consumers and decomposers, Energy flow in the ecosystem ,Ecological succession ,Food chains, Food webs and ecological pyramids, Introduction, types, characteristics features, structure and function of Forest ecosystem, Grassland ecosystem ,Desert ecosystem, Aquatic ecosystem (Ponds, Stream, lakes, rivers, oceans, estuaries); Biodiversity: Introduction, Definition: genetic, species and ecosystem diversity, Bio-geographical classification of India, Value of biodiversity consumptive use, productive use, social ethical, aesthetic and option values; Biodiversity at global, national and local level, India as a mega-diversity nation, Hot-spot of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Unit-II

Renewable and non-renewable resources, Natural resources and associated problems ,Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction, mining, dams and their effects on forests and tribal people; Water resources: Use and over utilization of surface and ground water, floods, droughts conflicts over water, dams benefits and problems; Mineral resources: Use and exploitation, environmental effects of extracting and mineral resources; Food resources: World food problem, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity; Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies; Land resources: Land as a resource, land degradation, main induced landslides, soil erosion and desertification, Role of an individual in conservation of natural resources, Equitable use of resources for suitable lifestyle.

- 10 -

CHAIRPERSON,
Dept. of Environmental Science
Guru Jambheshwar University
HISAR - 125001

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Unit-III

Definition of Environment Pollution; Causes, effects and control measures of: Air Pollution, Water Pollution, Soil pollution, Marine pollution, Noise pollution Thermal pollution, Nuclear hazards; Solid waste Management: Causes effects and control measures of urban and industrial wastes, Role of and individual in prevention of pollution, Pollution case studies, Disaster management: floods, earthquake, cyclone and landslides; Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies; different laws related to environment: Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act.; Issues involved in enforcement of environmental legislation, Public awareness

Unit-IV

Social issues and the Environment: From unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management; Resettlement and rehabilitation of people, its problem and concern, case studies; Environment ethics: Issues and possible solutions;Wasteland reclamation, Consumerism and waste products. Human Population growth, variation among nation, Population explosion- Family Welfare Programme, Environment and human health , Human Rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and human health, Case Studies.

Field Work: Visit to a local area to document environmental assets- river/forest/grassland/hill/mountain; Study of simple ecosystems – ponds, river, hill slopes etc. Study of common plants, insects, birds; Visit to a local polluted site-Urban/Rural/Industrial/Agricultural

TEXT BOOK:

1. Erach Bharucha, "Environmental Studies for Undergraduate Courses", University Grants Commission and Bharati Vidyapeeth Institute of Environment Education and Research, Pune, University press pvt. Ltd. (India)
2. Fundamental concepts in Environmental studies by Dr. D D Mishra. S. Chand publications

REFERENCE BOOKS:

1. Essentials of Ecology and Environmental Science by Dr. S. V .S. Rana, PHI Learning Pvt. Ltd, Delhi
2. Environmental Chemistry by Anil Kumar De, Wiley Eastern Limited
3. Environmental Science by T G. Miller, Wadsworth Publishing Co, 13th edition.
4. Ecology and Environment by P. D. Sharma, Rastogi publications

CHAIRPERSON,
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HISAR-125001.

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STRUCTURAL ANALYSIS-I

Course Code: CVE 201-L Course Credits: 4.0 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 02 hours (T) per week Examination Duration: 03 hours	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks

Prerequisite: Student should have prior knowledge of basic Mathematics like differentiation and integration etc.

Objectives:

- The objective of this course is to study the response of structures when subjected to external agitation.
- To understand the basic mechanics involved in simple structures.
- To help students to build the foundation for different ways of structure analysis.

Course outcomes:

CO-1 Basic application of mechanics involved commonly in the structures.
CO-2 Get the desired values of the resultant action in response to the agitation on the structures.
CO-3 Various techniques to analyse the structures following the slope and deflection approach.
CO-4 Analysis of trusses or forces in each member of trusses using simplified approach.

Unit-I

Analysis of stresses and strains:

Analysis of simple states of stresses and strains, elastic constraints, bending stresses, theory of simple bending, flexure formula, combined stresses in beams, shear stresses, Mohr's circle, Principle stresses and strains, torsion in shafts and closed thin walled sections, stresses and strains in cylindrical shells and spheres under internal pressure.

Theory of Columns:

Slenderness ratio, end connections, short columns, Euler's critical buckling loads, eccentrically loaded short columns, cylinder columns subjected to axial and eccentric loading.

Unit-II

Bending moment and shear force in determinate beams and frames:

Definitions and sign conventions, axial force, shear force and bending moment diagrams.

Three hinged arches:

Horizontal thrust, shear force and bending moment diagrams.

Unit-III

Deflections in beams:

Introduction, slope and deflections in beams by differential equations, moment area method and conjugate beam method, unit load method, Principle of virtual work, Maxwell's Law of Reciprocal Deflections.

Unit-IV

Analysis of statically determinate trusses:

Introduction, various types, stability, analysis of plane trusses by method of joints and method of sections. Analysis of space trusses using tension coefficient method.

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TEXT BOOK:

1 Strength of Materials Part-I, S.Timoshenko, Affiliated East-West Press, New.Delhi

REFERENCE BOOKS:

1 Mechanics of Solids, Prasad, V. S. Gakgotia Pub., New Delhi.
2 Elementary Structural Analysis, Jain, A. K., Nem Chand & Bros, Roorkee.
3 Elementary Structural Analysis, Wibur & Nooris, McGraw Hill Book Co., Newyork.
4 Structural Analysis, Bhavikatti S.S.,Vikas Pub.House, N.Delhi.

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FLUID MECHANICS-I

Course Code: CVE 203-L Course Credits: 3.5 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 01 hour (T) per week. Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: Student should have prior knowledge of basic Mathematics like differentiation and integration etc.

Objectives:

- The objective of this course is to study the response of fluids when subjected to external forces.
- To understand the basic fluid properties and its response for different flow conditions.
- To help students to study the behaviour and response of fluids using different approach.

Course outcomes:

CO-1 Basic properties of fluids and its application.
CO-2 Various conditions in respect to the flow of fluids and the concept of floating bodies.
CO-3 Flow measuring techniques and equipments with theories of fluid flow.
C0-4 Formation of hydraulic models and modules and dimension analysis of fluids.

Unit-I

Introduction:

Fluid properties, mass density, specific weight, specific volume and specific volume and specific gravity, surface tension, capillarity, pressure inside a droplet and bubble due to surface tension, compressibility viscosity, Newtonian and Non-newtonian fluids, real and ideal fluids.

Kinematics of Fluid Flow:

Stready & unsteady, uniform and non-uniform, laminar & turbulent flows, one, two & three dimensional, flows, stream lines, streak lines and path lines, continuity equation in differential form, rotation and circulation, elementary explanation of stream function and velocity potential, rotational and irrotational flows, graphical and experimental methods of drawing flownets.

Unit-II

Fluid Statics:

Pressure-density-height relationship, gauge and absolute pressure, simple differential and sensitive manometers, two liquid manometers, pressure on plane and curved surfaces, center of pressure, Buoyancy, stability of immersed and floating bodies, determination of metacentric height, fluid masses subjected to uniform acceleration, free and forced vortex.

Unit-III

Dynamic of Fluid Flow:

Euler's equation of motion along a streamline and its integration, limitation of Bernouli's equation, Pitot tubes, venturimeter, Orficemeter, flow through orifices & mouth pieces, sharp crested weirs and notches, aeration of nappe.

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Unit-IV

Boundary layer analysis:

Boundary layer thickness, boundary layer over a flat plate, laminar boundary layer, turbulent boundary layer, laminar sub-layer, smooth and rough boundaries, local and average friction coefficient, separation and its control.

Dimensional Analysis and Hydraulic Similude:

Dimensional analysis, Buckinghum theorem, important dimensionless numbers and their significance, geometric, kinematic and dynamic similarity, model studies, physical modeling, similar and distorted models.

TEXT BOOK:

1 Hydraulic and Fluid Mechanic by P.N.Modi & S.M.Seth
2 Fluid Mechanics by Dr. R. K. Bansal.

REFERENCE BOOKS:

1 Introduction to Fluid Mechanics by Robert W.Fox & Alan T.McDonald
2 Fluid Mechanics Through Problems by R.J.Garde
3 Engineering Fluid Mechanics by R.J.Garde & A.G.Mirajgaoker

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SURVEYING-I

Course Code: CVE 205-L Course Credits: 3.5 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 01 hour (T) per week. Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: Student should have prior knowledge of basic Mathematics like Geometry and Trigonometry etc.

Objectives:

- The objective of this course is to represent the general features of the land in their proper relative positions using field measurement.
- To understand the plotting and tracing of the topographical map of the field along with features on the sheet, to the required scale.
- To learn to prepare the map or plans to ease the planning and design of engineering products.

Course outcomes:

CO-1 Use of basic instruments for measurement of distances and angles with corrective measures.

CO-2 Able to understand the procedure of determining the height of a particular point from mean sea level and to plot the ground features on the sheet.

CO-3 Learn the use of digital and accurate instruments to determine the angles and to locate various points on the line.

CO-4 Learn the need of locating curves on the highways etc. in the plane areas and at the hills.

Unit-I

Fundamental Principles of Surveying:

Definition, objects, classification, fundamental principles, methods of fixing stations.

Measurement of distances:

Direct measurement, instruments for measuring distance, instruments for making stations, chaining of line, errors in chaining, tape corrections examples.

Compass and Chain Traversing:

Methods of traversing, instruments for measurement of angles-prismatic and surveyor's compass, bearing of lines, local attraction, examples.

Unit-II

Leveling:

Definition of terms used in leveling, types of levels and staff, temporary adjustment of levels, principles of leveling, reduction of levels, booking of staff readings, examples, contouring, characteristics of contours lines, locating contours, interpolation of contours.

Plane Table Surveying:

Plane table, methods of plane table surveying, radiation, intersection, traversing and resection, two point and three point problems.

Unit-III

Theodolite and Theodolite Traversing:

Theodolites, temporary adjustment of theodolite, measurement of angles, repetition and reiteration method, traverse surveying with theodolite, checks in traversing, adjustment of closed traverse, examples.

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Doors and Windows:
Locations, sizes, types of doors and windows, fixures and fastners for doors and windows.

Acoustics, Sound Insulation and Fire Protection:
Classification, measurement and transmission of sound, sound absorber, classification of absorbers, sound insulation of buildings, wall construction and accoustical design of auditorium, fire-resisting properties of materials, fire resistant construction and fire protection requirements for buildings.

Unit-III

B.MATERIALS

Stones:
Classification, requirements of good structural stone, quarrying, blasting and sorting out of stones, dressing, sawing and polishing, prevention and seasoning of stone.

Brick and Tiles:
Classification of bricks, constituents of good brick earth, harmful ingredients, manufacturing of bricks, testing of bricks.
Tiles: Terra-cotta, manufacturing of tiles and terra-cotta, types of terra-cotta, uses of terra-cotta.

Limes, Cement and Mortars:
Classification of lime, manufacturing, artificial hydraulic lime, pozzolona, testing of lime, storage of lime, cements composition, types of cement, manufacturing of ordinary Portland cement, testing of cement, special types of cement, storage of cement.
Mortars: Definition, proportions of lime and cement mortars, mortars for masonry and plastering.

Unit-IV

Timber:
Classification of timber, structure of timber, seasoning of timber, defects in timber, fire proofing of timber, plywood, fiberboard, masonite and its manufacturing, important Indian timbers.

Ferrous and Non-Ferrous Metals:
Definitions, manufacturing of cast iron, manufacturing of steel from pig iron, types of steel, marketable form of steel, manufacturing of aluminium and zinc.

Paints and Varnishes:
Basic constituents of paints, types of paints, painting of wood, constituents of varnishes, characteristics and types of varnishes.

Plastic:
Definition, classification of plastics, composition and raw materials, manufacturing, characteristics and uses, polymerization, classification, special varieties.

C. DRAWINGS

1. **Typical drawings of:**
   a) Cavity Wall
   b) Bonds in brick work
   c) Grillage foundation
2. **Preparation of building drawing mentioning its salient features including the following details:**
   a) Ground floor plan
   b) Two Sectional Elevations
   c) Front and Side Elevations
   d) Plan and Sectional Elevation of stair case, doors/ windows/ ventilators, floor and roof.

TEXT BOOK:

1 Building Construction, Sushil Kumar, Standard Pub., N. Delhi
2 Building Material, Rangawala

REFERENCE BOOKS:

1 Construction Engineering, Y.S. Sane
2 Building Construction, Gurcharan Singh, Standard Pub., N. Delhi.

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SURVEYING-I Lab

Course Code: CVE 205-P Course Credits: 1.5 Type: Compulsory Contact Hours: 3 hours per week. Mode: Practical session	**Course Assessment Methods (Internal: 30; External: 70)** Internal continuous assessment of 30 marks on the basis of class performance and attendance in practical classes. For the end semester practical examination the assessment will be done out of 70 marks by the external and internal examiners.

Prerequisite: Student should have prior knowledge of reading the equipments with accuracy.

Objectives:

- The objective of this course is to represent the general features of the land in their proper relative positions using field measurement.
- To understand the plotting and tracing of the topographical map of the field along with features on the sheet, to the required scale.
- To learn to prepare the map or plans to ease the planning and design of engineering structures.

Course outcomes:

CO-1 Use of basic instruments for measurement of distances and angles with corrective measures.
CO-2 Able to understand the procedure of determining the height of a particular point from mean sea level and to plot the ground features on the sheet.
CO-3 Learn the use of digital and accurate instruments to determine the angles and to locate various points on the line.
CO-4 Learn the need of locating curves on the highways etc. in the planes and at the hills.

LIST OF EXPERIMENTS:

1 Chain surveying: Chaining and chain traversing.
2 Compass traversing.
3 Plane tabling: methods of plane table surveying, two point problem.
4 To verify the, three point problem.
5 Leveling: Profile leveling and plotting of longitudinal section and cross sections.
6. Permanent adjustment of level.
7. Reciprocal leveling.
8. Contouring and preparation contour map.
9. Use of Tangent Clinometers.

Note: At-least seven experiments are to be performed by students from the above list. The course coordinator may also design and set experiments in addition to the above list/topic as per the scope and requirement of syllabus.

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FLUID MECHANICS-I Lab

Course Code: CVE 203-P
Course Credits: 1
Type Course: Compulsory
Contact Hours: 2 hours per week
Mode: Practical session

Course Assessment Methods (Internal: 30; External: 70) Internal continuous assessment of 30 marks on the basis of class performance and attendance in practical classes.
For the end semester practical examination the assessment will be done out of 70 marks by the external and internal examiners.

Prerequisite = Student should have prior knowledge of reading the equipments with accuracy.

Objectives:

The objective of this course is to study the response of fluids when subjected to external forces.
To understand the basic fluid properties and its response for different flow conditions.
To help students to study the behaviour and response of fluids using different approach.

Course outcomes:

1 Basic properties of fluids and its application.
2 Various conditions in respect to the flow of fluids and the concept of floating bodies.
3 Flow measuring techniques and equipments with theories of fluid flow.
4 Formation of hydraulic models and modules and dimension analysis of fluids.

LIST OF EXPERIMENTS:

1. To determine meta-centric height of the ship model.
2. To verify the Bernoulli's theorem.
3. To determine coefficient of discharge for an Orifice-meter.
4. To determine coefficient of discharge of a venture-meter.
5. To determine the various hydraulic coefficients of an Orifice (C_d, Cc, Cv).
6. To determine coefficient of discharge for an Orifice under variable head.
7. To calibrate a given notch.
8. To determine coefficient of discharge for a mouth piece.
9. Drawing of a flow-net by Viscous Analogy Model and Sand Box Model.
10. To study development of boundary layer over a flat plate.
11. To study velocity distribution in a rectangular open channel.
12. Velocity measurements by current meter, float, double float (demonstration only).
13. Experiment on Vortex formation (demonstration only).

Note: At-least seven experiments are to be performed by students from the above list. The course coordinator may also design and set experiments in addition to the above list/topic as per the scope and requirement of syllabus.

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FUNDAMENTALS OF MANAGEMENT

Course Code: HUM 201-L Course Credits: 3.0 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) per week. Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: The students should have basic understanding of the concept of management and business organizations.

Objectives:

- To enhance knowledge skills and attitude to Management.
- To understand management and its relationship with organisation.

Course outcomes:

CO-1 To develop the basic understanding of the concept of management and functions of management.
CO-2 The students will come to know about Human Resource management and Marketing management functions of management.
CO-3 Students will come to know about the production activities of any manufacturing organisations.
CO-4 To know that how finances are arranged and disbursed for all the activities of business organisations.

Unit-I

Concept of Management: Definitions, Characteristics, Significance, Practical Implications; Management Vs. Administration: Management- Art, Science and Profession; Development of Management Thoughts; Managerial Functions.

Unit-II

Concept of Human Resource Management: Human resource planning; Recruitment, Selection, Training and Development, Compensation; Concept of Marketing Management: Objectives and functions of Marketing, Marketing Research, Advertising, Consumer Behaviour.

Unit-III

Concept of Production Management, Production Planning and Control, Material management, Inventory Control, Factory location and Production Layout.

Unit-IV

Concept of Financial Management, Capital Structure and various Sources of Finance, Working Capital, Short term and long term finances, Capital Budgeting.

TEXT BOOK:

1. Principles and Practices of Management: R. S. Gupta, B. D. Sharma, N. S. Bhalla; Kalyani Publishers.
2. Organisation and Management: R. D. Aggarwal; Tata McGraw Hill.

REFERENCE BOOKS:

1. Marketing Management: S. A. Sherlikar; Himalaya Publishing House.
2. Financial Management: I.M. Pandey; Vikas Publishing House.
3. Production Management: B. S. Goel; Himalaya Publishing House.

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SKILLS AND INNOVATION LAB

Course Code: CVT-211-P Course Credits: 0.0 Mode: Practical Contact Hours: 03 hours per week Examination Duration: 03 hours	**Course Assessment Methods (internal: 30; external: 70):** This is a non-credit course of qualifying nature Internal practical evaluation is to be done by the course coordinator. The end semester practical examination will be conducted jointly by external and internal examiners.

Prerequisite: Basic knowledge of Civil Engineering

Objectives:

1. Understand and identify research topics related to Civil Engineering through brain storming sessions.
2. Propose a novel idea/modified technique/new interpretation after identifying the existing research work.
3. Devise specific identified issue/problem in the form of research objectives.
4. Work in a group and communicate effectively the research topic though presentation and/or brain storming.

Course outcomes:

CO-1 Understand the research analysis of issues/problems on topics related to Civil Engineering.

CO-2 Understand the techniques and tools used for research analysis.

CO-3 Understand literature related to a research topic.

CO-4 Communicate effectively the research topic though presentation and/or brainstorming.

Lab Contents

A group of students are required to carry out a study related to current development and emerging trends in the field of Civil Engineering. Each group of students will also try to improve their basic skills in their respective field. The students may use the equipment's/machines/instruments available in the labs/workshops with the due permission of Chairperson/Director on recommendation of the Course Coordinator.

The students in consultation with the course coordinator will decide the topic of the study. The study report will be submitted by group at the end of semester and will be evaluated jointly by external and internal examiners.

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STRUCTURAL ANALYSIS-II

Course Code: CVE 202-L Course Credits: 4.0 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 2 hours (T) per week. Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: Student should have prior knowledge of basic Mathematics like differentiation and integration etc.

Objectives:

- The objective of this course is to study the response of structures when subjected to external agitation.
- To understand the basic mechanics involved in complex structures.
- To help students to apply different theories to solve different structures for desired results.

Course outcomes:

CO-1 Basic application of mechanics involved in complex structures.
CO-2 Get the desired values of the resultant action in response to the agitation on the complex structures.
CO-3 Various techniques to analyse the complex structures following different approach.
CO-4 Analysis of unsymmetrical structures and to determine the stresses in structures like cable and suspension bridges.

Unit-I

Statically Indeterminate Structures:

Introduction, Static and Kinematic Indeterminacies, Castigliano's theorems, Strain energy method, Analysis of frames with one or two redundant members using Castigliano's 2^{n} theorem.

Unit-II

Slope deflection and moment Distribution Methods:

Analysis of continuous beams & portal frames. Portal frames with inclined members.

Unit-III

Column Analogy Method:

Elastic centre, Properties of analogous column, Applications to beam & frames.

Analysis of Two hinged Arches:

Parabolic and circular Arches, Bending Moment Diagram for various loadings, Temperature effects, Rib shortening, Axial thrust and Radial Shear force diagrams.

Unit-IV

Unsymmetrical Bending

Introduction Centroidal principal axes of sections, Bending stresses in beam subjected to unsymmetrical bending, shear centre, shear centre for channel, Angles and Z sections.

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MATHEMATICS – III

Course Code: MAT 201-I Course Credits: 3.5 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 1 hour (T) per week Examination Duration: 03 hours	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks

Prerequisite: Basic knowledge of calculus, complex analysis and statistics.

Course outcomes:

CO-1 Problems of Fourier series and Fourier transforms used in engineering applications
CO-2 Calculation of improper/ singular integrals with the help of complex analysis
CO-3 Statistical tests for system goodness.
CO-4 Problems of LPP and their interpretation.

Unit-I

Fourier Series and Fourier Transforms: Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and cosine series, Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes), Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac delta function.

Unit-II

Functions of Complex Variable: Definition, Exponential function, Trigonometric and Hyperbolic functions, Logarithmic functions, Limit and Continuity of a function, Differentiability and Analyticity, Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations, Harmonic functions, Integration of complex functions, Cauchy Theorem, Cauchy- Integral formula.

Unit-III

Power series, radius and circle of convergence, Taylor's Maclaurin's and Laurent's series, Zeroes and singularities of complex functions, Residues, Evaluation of real integrals using residues (around unit and semi circle only).

Unit-IV

Probability Distributions and Hypothesis Testing: Expected value of a random variable, Properties and application of Binomial, Poisson and Normal distributions, Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (applications only), Chi-square test of goodness of fit. **Linear Programming:** Linear programming problems formulation, Solving linear programming problems using (i) Simplex method.

TEXT BOOK:

1. Advanced Engg. Mathematics : F Kreyszig.
2. Higher Engg. Mathematics : B.S. Grewal.

REFERENCE BOOKS:

1. Advance Engg. Mathematics : R.K. Jain, S.R.K. Iyenger.
2. Advanced Engg. Mathematics : Michael D. Greenberg.
3. Operation Research : H.A. Taha.
4. Probability and statistics for Engineers : Johnson, PHI.

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FLUID MECHANICS-II

Course Code: CVE 204-L Course Credits: 4 0 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 2 hours (T) per week Examination Duration: 03 hours	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks. For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: Student should have prior knowledge of basic Mathematics like differentiation and integration etc.

Objectives:

- The objective of this course is to study the response of fluids when subjected to external forces.
- To understand the origin of flow conditions and to recognize this using different measurements.
- To help students to study the behaviour and response of pumps and turbines.

Course outcomes:

CO-1 Basic flow conditions and their analysis with the help of fluid properties.
CO-2 Various forces exerted on the floating and submerged bodies in fluids and application of internal forces of fluids.
CO-3 Knowledge of different types of flow.
CO-4 Formation behaviour and response of pumps and turbines.

Unit-I

Laminar Flow:

Navier Stoke's equation, Laminar flow between parallel plates, Couette flow, laminar flow through pipes-Hagen Poiseuille law, laminar flow around a sphere-Stokes'law.

Flow through pipes:

Types of flows-Reynold's experiment, shear stress on turbulent flow, boundary layer in pipes-Establishment of flow, velocity distribution for turbulent flow in smooth and rough pipes, resistance to flow of fluid in smooth and rough pipes, Stanton and Moody's diagram. Darcy's weisbach equation, other energy losses in pipes, loss due to sudden expansion, hydraulic gradient and total energy lines, pipes in series and in parallel, equivalent pipe, branched pipe, pipe networks, Hardy Cross method, water hammer.

Unit-II

Drag and Lift:

Types of drag, drag on a sphere, flat plate, cylinder and airfoil, development of lift on immersed bodies like circular cylinder and airfoil.

Open Channel Flow:

Type of flow in open channels, geometric parameters of channel section, uniform flow, most economical section (rectangular and trapezoidal), specific energy and critical depth, momentum in open channel, specific force, critical flow in rectangular channel, applications of specific energy and discharge diagrams to channel transition, metering flumes, hydraulic jump in rectangular channel, surges in open channels, positive and negative surges, gradually varied flow equation and its integration, surface profiles.

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Cable and suspension Bridges:
Introduction, uniformly loaded cables, Temperature stresses, three hinged stiffening Girder and two hinged stiffening Girder

TEXT BOOK:

1. Statically Indeterminate Structures, C.K. Wang, McGraw Hill Book Co., New York.
2. Advanced Structural Analysis, A.K. Jain, Nem Chand & Bros., Roorkee.

REFERENCE BOOKS:

1. Indeterminate Structures, R.L. Jindal, S. Chand & Co., New Delhi.
2. Theory of Structures, Vol. I, S.P. Gupta & G.S.Pandit, Tata McGraw Hill, New Delhi.

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SOIL MECHANICS

Course Code: CVE 206-L Course Credits: 3.5 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 1 hour (T) per week Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: Student should have prior knowledge of basic definitions of mass, volume, density and simple mathematics.

Objectives:

- The objective of this course is to provide sufficient theoretical and practical knowledge about the properties of soil and earth material.
- To study and understand the behavior of different types of soil materials under loading.
- To understand the need of strengthening of soil related to construction activities.

Course outcomes:

CO-1 Understand the soil composition, its formation and its classification.

CO-2 Able to understand the compaction of soil under loading and comparing the theoretical values with the experimental ones.

CO-3 Learn how to analyse the stresses in the soils in the depth and to find the settlement of soils under loading.

CO-4 Knowledge to find out the shear strength in soils and to learn different theories of earth pressure.

Unit-I

Soil Formation and Composition

Introduction, soil and rock, Soil Mechanics and Foundation Engineering, origin of soils, weathering, soil formation, major soil deposits of India, particle size, particle shape, inter particle forces, soil structure, principal clay minerals.

Basic Soil Properties

Introduction, three phase system, weight-volume relationships, soil grain properties, soil aggregate properties, grain size analysis, sieve analysis, sedimentation analysis, grain size distribution curves, consistency of soils, consistency limits and their determination, activity of clays, relative density of sands.

Classification of soils

Purpose of classification, classification on the basis of grain size, classification on the basis of plasticity, plasticity chart, Indian Standard Classification System.

Permeability of Soils

Introduction, Darcy's law and its validity, discharge velocity and seepage velocity, factors affecting permeability, laboratory determination of coefficient of permeability, determination of field permeability, permeability of stratified deposits.

Unit-II

Effective Stress Concept

Principle of effective stress, effective stress under hydrostatic conditions, capillary rise in soils, effective stress in the zone of capillary rise, effective stress under steady state hydro-dynamic conditions, seepage force, quick condition, critical hydraulic gradient, two dimensional flow, Laplace's equation, properties and utilities of flownet, graphical method of construction of flownets, piping, protective filter.

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Unit-III

Compressible flow:

Basic relationship of thermodynamics continuity, momentum and energy equations, propagation of elastic waves due to compression of fluid, Mach number and its significance, subsonic and supersonic flows, propagation of elastic wave due to disturbance in fluid mach cone, stagnation pressure.

Unit-IV

Pumps and Turbines:

Reciprocating pumps, their types, work done by single and double acting pumps. Centrifugal pumps, components and parts and working, types, heads of a pump-statics and manometric heads,. Force executed by fluid jet on stationary and moving flat vanes, Turbines-classifications of turbines based on head and specific speed, component and working of Pelton wheel and Francis turbines, cavitation and setting of turbines.

TEXT BOOK:

1 Hydraulics & Fluid Mechanics by P.N.Modi and S.M.Seth
2 Fluid Mechanics by R. K. Bansal

REFERENCE BOOKS:

1 Flow in Open Channels by S.Subraminayam
2 Introduction to Fluid Mechanics by Robert N.Fox & Alan T.Macnold

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SURVEYING -II

Course Code: CVE 208-L Course Credits: 3.5 Mode: Lecture(L) and Tutorial(T) Type: Compulsory Contact Hours: 3 hours (L) + 1 hour (T) per week Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine question are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus, it will contain seven short answer type question. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Prerequisite: Student should have prior knowledge of basic Mathematics like Geometry and Trigonometry etc.

Objectives:

- The objective of this course is to use different mathematical models to find the location of the general features of the land in their proper relative positions.
- To identify the sources of error and to learn the application of different mathematical models to correct these.
- To introduce the new techniques for ease of survey like aerial photographs, GIS and GPS etc.

Course outcomes:

CO-1 Application of Trigonometry to find the location of the general features of the land in their proper relative positions.
CO-2 Able to understand the errors generated in survey process and methods to rectify these.
CO-3 Understand the theory of positions: Latitude and longitude of astronomical features.
CO-4 Learn new techniques for ease of survey like aerial photographs, GIS and GPS.

Unit-I

Trigonometrical Levelling:

Introduction, height and distances-base of the object accessible, base of object inaccessible, geodetical observation, refraction and curvature, axis signal correction, difference in elevation between two points.

Triangulation:

Triangulation systems, classification, strength of figure, selection of triangulation stations, grade of triangulation, field work of triangulation, triangulation computations, introduction to E.D.M. instruments.

Unit-II

Survey Adjustment and Treatment of Observations:

Types of errors, definition of weight of an observation, most probable values, law of accidental errors, law of weights, determination of probable error (different cases with examples) principle of least squares, adjustment of triangulation figures by method of least squares.

Unit-III

Astronomy:

Definitions of astronomical terms, star at elongation, star at prime vertical star at horizon, star at culmination, celestial coordinate systems, Napier's rule of circular parts, various time systems: sidereal, apparent, solar and mean solar time, equation of time-its cause.

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Compaction

Introduction, role of moisture and compactive effect in compaction, laboratory determination of optimum moisture content, moisture density relationship, compaction in field, compaction of cohesionless soils, moderately cohesive soils and clays, field control of compaction.

Unit-III

Vertical Stress below Applied Loads

Introduction, Boussinesq's equation, vertical stress distribution diagrams, vertical stress beneath loaded areas, Newmark's influence chart, approximate stress distribution methods for loaded areas, Westergaard's analysis, contact pressure.

Compressibility and Consolidation

Introduction, components of total settlement, consolidation process, one-dimensional consolidation test, typical void ratio-pressure relationships for sands and clays, normally consolidated and over consolidated clays, Casagrande's graphical method of estimating pre-consolidation pressure, Terzaghi's theory of one-dimensional primary consolidation, determination of coefficients of consolidation, consolidation settlement, Construction period settlement, secondary consolidation.

Unit-IV

Shear Strength

Introduction, Mohr stress circle, Mohr-Coulomb failure-criterion, relationship between principal stresses at failure, shear tests, direct shear test, unconfined compression test, triaxial compression tests, drainage conditions and strength parameters, Vane shear test, shear strength characteristics of sands, normally consolidated clays, over-consolidated clays and partially saturated soils, sensitivity and thixotropy.

Earth Pressure

Introduction, earth pressure at rest, Rankine's active & passive states of plastic equilibrium, Rankine's earth pressure theory, Coulomb's earth pressure theory, Culmann's graphical construction, Rebhann's construction.

TEXT BOOK:

1 Basic and Applied Soil Mechanics by Gopal Ranjan, ASR Rao, New Age Intetrnational(P)Ltd.Pub.N.Delhi.

2 Soil Mechanics and foundation engineering by Dr. K. R. Arora.

REFERENCE BOOKS:

1 Soil Engg. in Theory and Practice, Vol .I. Fundamentals and General Principles by Alam Singh, CBS Pub.,N.Delhi.

2 Engg.Properties of Soils by S.K.Gulati, Tata-Mcgraw Hill,N.Delhi.

3 Geotechnical Engg. by P.Purshotam Raj,Tata Mcgraw Hill.

4 Principles of Geotechnical Engineering by B.M.Das,PWS KENT, Boston.

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FLUID MECHANICS-II Lab

Course Code: CVE 204-P Course Credits: 1 Type: Compulsory Contact Hours: 2 hours per week. Mode: Practical session	**Course Assessment Methods (Internal: 30; External: 70)** Internal continuous assessment of 30 marks on the basis of class performance and attendance in practical classes. For the end semester practical examination the assessment will be done out of 70 marks by the external and internal examiners.

Prerequisite: Student should have prior knowledge of reading the equipments with accuracy.

Objectives:

- The objective of this course is to study the response of fluids when subjected to external forces.
- To understand the basic fluid properties and its response for different flow conditions.
- To help students to study the behaviour and response of fluids in different pipe fittings.

Course outcomes:

CO-1 Basic properties of fluids and its application.
CO-2 Various conditions in respect to the flow of fluids and the concept of floating bodies.
CO-3 Properties and functioning of centrifugal pump.
CO-4 Study of flow in various pipe fittings.

LIST OF EXPERIMENTS:

1. To determine the coefficient of drag by Stoke's law for spherical bodies.
2. To study the phenomenon of cavitation in pipe flow.
3. To determine the critical Reynold's number for flow through commercial pipes.
4. To determine the coefficient of discharge for flow over a broad crested weir.
5. To study the characteristics of a hydraulic jump on a horizontal floor and sloping glacis including friction blocks.
6. To study the scouring phenomenon around a bridge pier model.
7. To study the scouring phenomenon for flow past a spur.
8. To determine the characteristics of a centrifugal pump.
9. To study the momentum characteristics of a given jet.
10. To determine head loss due to various pipe fittings.

Note: At-least seven experiments are to be performed by students from the above list. The course coordinator may also design and set experiments in addition to the above list/topic as per the scope and requirement of syllabus.

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Unit-IV

Elements of Photo-grammetry:

Introduction: types of photographs, types of aerial photographs, aerial camera and height displacements in vertical photographs, stereoscopic vision and stereoscopies, height determination from parallax measurement, flight planning.

Introduction of remote sensing and its systems:

Concept of G I S and G P S. -Basic Components, data input, storage & output.

TEXT BOOK:

1. Surveying Vol 2 by B C Punmia
2. Surveying Vol 3 by B C Punmia

REFERENCE BOOKS:

1. Surveying Vol2 by T.P.Kanitkar
2. Higher Surveying by A M Chandra

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SURVEYING-II Lab

Course Code: CVE 208-P
Course Credits: 1.5
Type: Compulsory
Contact Hours: 3 hours per week.
Mode: Practical session

Course Assessment Methods (Internal: 30; External: 70) Internal continuous assessment of 30 marks on the basis of class performance and attendance in practical classes
For the end semester practical examination the assessment will be done out of 70 marks by the external and internal examiners

Prerequisite: Student should have prior knowledge of reading the equipments with accuracy.

Objectives:

- The objective of this course is to teach about Theodolite and advantage of its use for different measurements.
- To understand different approaches to find the locations and distances of different points, lines desired in survey process.
- To learn to prepare the map or plans to ease the planning and design of engineering structures.

Course outcomes:

CO-1 Use of Theodolite for measurement of distances and angles with corrective measures.
CO-2 Able to understand the procedure of use of Tachometer and tacheometry to determining the height of a particular point and horizontal distance.
CO-3 Learn the use of Triangulation and plot the topographical map.
CO-4 Learn to plot the Base line with different methods meant to provide accuracy in plotting.

LIST OF EXPERIMENTS:

Theodilite:

1. Study of theodolite, measurement of horizontal angle.
2. Measurement of vertical angle.
3. Permanent adjustment.

Tacheometry:

4. Tachometric constants.
5. Calculation of horizontal distance and elevation with the help of Tacheometer.

Curves:

6. Setting of simple circular curves by off- set method: off -set from chord produced.
7. Setting of simple circular curves by off- set method: off -set from long chord.
8. Setting of simple circular curves by deflection angle Method.

Triangulation:

9. An exercise of triangulation
10. Base line measurement.

Note: At-least seven experiments are to be performed by students from the above list. The course coordinator may also design and set experiments in addition to the above list/topic as per the scope and requirement of syllabus.

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SOIL MECHANICS Lab

Course Code: CVE 206-P Course Credits: 1 Type: Compulsory Contact Hours: 2 hours per week. Mode: Practical session	**Course Assessment Methods (Internal: 30; External: 70)** Internal continuous assessment of 30 marks on the basis of class performance and attendance in practical classes. For the end semester practical examination the assessment will be done out of 70 marks by the external and internal examiners

Prerequisite: Student should have prior knowledge of basic definitions of mass, volume, density and simple mathematics.

Objectives:

- The objective of this course is to provide sufficient theoretical and practical knowledge about the properties of soil and earth material.
- To find out the soil properties under dry and wet conditions.
- To experimentally verify the behavior of different types of soil materials under loading.

Course outcomes:

CO-1 Understand the soil composition, its formation and its classification.
CO-2 Able to understand the methods of determination of soil properties useful in various construction activities.
CO-3 Learn the response of water penetration in the soils and its behaviour to wet conditions under loading
CO-4 Knowledge to find out the shear strength in soils and to relate the theoretical theories.

LIST OF EXPERIMENTS:

1. Visual Soil Classification and water content determination.
2. Determination of specific gravity of soil solids.
3. Grain size analysis-sieve analysis.
4. Liquid limit and plastic limit determination.
5. Field density by:
   i) Sand replacement method
   ii) Core cutter method
6. Proctor's compaction test.
7. Coefficient of permeability of soils.
8. Unconfined compressive strength test.
9. Direct shear test on granular soil sample.
10. Unconsolidated undrained (UU) triaxial shear test of fine grained soil sample.

Note: At-least seven experiments are to be performed by students from the above list. The course coordinator may also design and set experiments in addition to the above list/topic as per the scope and requirement of syllabus.

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PERSONALITY DEVELOPMENT

Course Code: PSY-201-L Course Credit: 0.0 Contact Hours: 03hrs/week Mode: Lecture(L) and Tutorial(T) Examination Duration: 3 Hours	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus; it will contain seven short answer type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Objectives:

1. Holistic development of the students.
2. Make the students to understand self and personality through the interactive task based sessions.
3. To develop the life skills required to lead an effective personal and professional life.

Expected outcomes:

CO-1 Understand the concept of self and personality.
CO-2 Develop the life skills required to lead an effective personal and professional life.

Unit-I

Understanding the concept of self, Self-Esteem, Characteristics of individuals with high and low self-esteem. Self- Confidence. Strategies of building self-confidence. Case Study.

Unit-II

Understanding Personality, Factors affecting Personality: Biological, Psychological
Social, Theories of Personality: Freud, Allport.
Personality Assessment- Neo-Big Five Personality Test; T.A.T

Unit-III

Stress: Causes of Stress and its impact, Strategies of stress management.
Case study.

Unit-IV

Emotional Intelligence: Concept, emotional quotient why Emotional Intelligence matters, Measuring EQ, Developing healthy emotions.
Management of anger and interpersonal relations. Case study.

TEXT BOOK:

1. Burger, J.M. (1990), Personality, Wardsworth: California.
2. Hall C.S., Lindzey, G. (1978), Theories of Personality, New York: Wiley Eastern Limited.
3. Morgan, C.T.King R.A. Weisz, J.R., and Schopler, J. (1987), Introduction to Psychology, Singapore: Mc Graw Hill.
4. Byronb. D., and Kalley, N. (1961). Introduction to Personality: Prentice Hall.
5. Taylor,S.E., (2009). Health Psychology (9th Ed), New Delhi: Tata McGraw-Hill Publishing Company Ltd.

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