



Marks: 100 (IA=30, ETE=70)

End Term Exam: 3 Hours

3CE4-01: Fluid Mechanics

3CE4-01: Fluid Mechanics

Credit: 3Max

3L+0T+0P

Course Objectives

- 1. To get familiar with the fundamentals of fluid and fluid flow characteristics.
- 2. To introduce the students about properties of the fluids, behavior of fluids under static conditions and to impart basic knowledge of the dynamics of fluids through the control volume approach and to expose to the applications of the conservation laws to a) flow measurements b) flow through pipes (both laminar and turbulent) and c) forces on pipe bends with an exposure to the significance of boundary layer theory and its applications.

- 1. Demonstrate the difference between the behavior of solids and fluids in static conditions and their properties.
- 2. Apply the conservation laws applicable to fluids and their applications through fluid kinematics and dynamics.
- 3. Explain the concept of momentum and angular momentum equations and their applications.
- 4. Estimate losses in pipelines for both laminar and turbulent conditions and analysis of pressure difference and velocity distribution in pipes.
- 5. Apply the knowledge to solve applied problems in civil engineering domain relating to fluid flow.

S.N.	Contents	Hours
1	Fluids: Definition, Type of fluids, Ideal fluids, real fluids, Newtonian and non-Newtonian fluids.	4
	Properties of Fluids: Units of measurement, Mass density, Specific weight, Specific volume, Specific Gravity, Viscosity, Surface tension and Capillarity, Compressibility and Elasticity	
2	Principles of Fluid Statics: Basic equations, Pascal Law, Types of pressure: Atmospheric pressure, Gauge pressure, Vacuum pressure, Absolute pressure, Pressure gauges	5
3	Buoyancy; Forces acting on immersed plane surface. Centre of pressure, forces on curved surfaces. Conditions of equilibrium for floating bodies, meta-centre and analytical determination of meta centric height	7
4	Kinematics of Flow: Visualization of flow, Types of flow: Steady and unsteady, uniform and non- uniform, rotational and irrotational flow, Laminar and turbulent flow, streamline, path line, streak line, principle of conservation of mass, equation of continuity, acceleration of fluid particles local and convective, velocity, acceleration, velocity potential and stream function, elementary treatment of flow net, vorticity, circulation, free and forced vortex. Fluid mass subject to horizontal and vertical acceleration and uniform rotation	8
5	Fluid Dynamics: Control volume approach, Euler's equation, Bernoulli's equation and its applications. Reynolds transport theorem,	10
	Venture-meter, Orifice-meter, Orifices & mouthpieces, Time of emptying of tanks by orifices, Momentum and angular momentum equations and their applications, pressure on flat plates and nozzles.	
6	Laminar Flow through Pipes: Laminar flow through pipes, Relation between shear & pressure gradient. Flow between plates & pipes. Hagen Poiseuille equation, Equations for velocity distribution, pressure difference velocity distribution over a flat plate and in a pipe section, Darcy-Weisbach equation, friction factor, minor losses, pipe networks	8
	Total	42





- 1. Fox, Robert W., Alan T. McDonald, and John W. Mitchell. (2020). Fox and McDonald's introduction to fluid mechanics, John Wiley & Sons.
- 2. Streeter, V. L. Wylie, E. B., and Bedford K.W. (2010). Fluid Mechanics, Tata McGraw Hill, New Delhi.
- 3. Modi P.N. and Seth S. M. (2019). Hydraulics and Fluid Mechanics including Hydraulic Machines, Standard Book House, New Delhi.
- 4. Som S. K., Biswas G., and Chakraborty S. (2012). Introduction to Fluid Mechanics and Fluid Machines, Tata McGraw Hill, Education Pvt. Ltd.
- 5. Pani B. S. (2016). Fluid Mechanics: A Concise Introduction, Prentice Hall of India Private Ltd.
- 6. Jain A. K. (2016). Fluid Mechanics including Hydraulic Machines, Khanna Publishers, New Delhi.
- 7. Narayana Pillai N. (2009). Principles of Fluid Mechanics and Fluid Machines, (3rd. Ed.) University Press (India) Pvt. Ltd.



3CE4-02: Surveying



Marks: 100 (IA=30, ETE=70)

End Term Exam: 3 Hours

Credit: 3Max

3L+1T+0P

Course Objectives

- 1. To provide basic knowledge about principles of surveying, and its applications in various engineering domains.
- 2. To provide a practical understanding of different types of survey works.
- 3. To figure out the required areas and volumes of land and materials needed in construction work.
- 4. To ensure that the construction takes place in the correct relative and absolute positions on the ground.
- 5. To provide an understanding of the working principles of survey instruments including conventional and modern practice.

- 1. Survey of an area under various topography and obstructions.
- 2. Prepare the plan or map of the area surveyed.
- 3. Development of contours and elevation profiles
- 4. Analyze, report, and wherever appropriate, distribute the survey errors.
- 5. Set out curve and building lay out.
- 6. Perform instruments checks to ensure they meet the specifications.

S.N.	Contents	Hours
1	Surveying Principles : Definitions, Types of Surveys, Classification of surveys, Principle, distorted or shrunk scales, Overview of modern surveying data system- Geomatics, Errors and mistakes, Accuracy and precision in surveying, Types of measurables- distance, angles, and elevation.	
	Overview of historical Surveying Instruments - chains, tapes, and ranging, Field compass, Theodolite; Modern - Total station, GNSS Positioning.	10
	Theodolite : Types of theodolites, measurement of angles, temporary and permanent adjustments, closed & open traverse, omitted measurements, consecutive and independent co-ordinates, advantages and disadvantages of traversing closing error, Bowditch & Transit Rules	
2	Distance Measurements: Overview of distance measurement techniques- Chains, Taping, errors in distance measurement and correction, Operations in planimetric mapping, measurements using offsets, Optical distance measurement (ODM), Electronic Distance Measurement (EDM), EDMI classification, Total station setup, Errors in EDMI	7
3	Direction Measurements: Definitions, Horizontal and vertical angles, Azimuth and bearings, Deflection angles, Computations of angles and interconversion, Overview of local attraction, Overview of instruments, Relation between angles and distances, Observing horizontal and vertical angles,	7
4	Elevation Measurements: Reference surfaces/Datum, Positioning- planimetric, Geodetic, height above ellipsoid, Definitions- Reduced Level, levelling, trigonometric heights, physical heights, lines and planes, level surfaces, elevation and altitude, Benchmarks, types of Benchmarks, Principle of optical levelling, Structure of levels (auto and dumpy), Reading a levelling staff, Methods of levelling, Accuracy standards for levelling.	11
	Level nets, loop closure, Contouring, Contour intervals, representation of reliefs, horizontal equivalent, contour interval, characteristics of contours, methods of contouring, contour gradient.	





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DEM, DSM, DTM, Interpolation techniques in DEM generation, Overview of photogrammetry and laser scanning. Topographic mapping and map projections. Curves setting: Definition, elements of a simple curve, different methods of setting out a simple circular curve, elements of a compound curve, reverse curves, transition curves, their characteristics and setting out, vertical curves, setting out vertical curves, sight distances. 5 Control Survey & Traversing: Control networks, Control establishment- GNSS positioning modes- PPS, PPK, RTK, overview of differential positioning. Triangulation and Trilateration, criterion for selection of layout of triangles. 7 Traverse, types of traverses, referencing traverse stations, Traverse field notes, linear and angle misclosures, latitude and departure, relative precision, specifications in traversing, Traverse balancing- Bowditch's rule, Transit method, overview of least squares adjustment, rectangular coordinates from latitude and departure, Gale's Table Total 42

- 1. Charles D. Ghilani & Paul R. Wolf. (2018). Elementary Surveying, Pearson.
- 2. Kavanagh, B. (2018). Surveying Principles and Applications, Pearson.
- 3. Schoffield W., Breach, M. (2007). Engineering Surveying, CRC Press.
- 4. Subramanian, R. (2007). Surveying and Leveling, Oxford.
- 5. Kanetkar, T.P., and Kulkarni, S.L. (2006). Surveying and Leveling Part I and II, Pune Vidhyarthi Griha Prakashan.
- 6. Punmia, B.C., Jain, Ashok Kumar and Jain, Arun Kumar (2005). Surveying Vol. I and II, Laxmi Publications.





Marks: 100 (IA=30, ETE=70)

End Term Exam: 3 Hours

3CE4-03: Building Materials

3CE4-03: Building Materials

Credit: 3Max

2L+0T+0P

Course Objectives

- 1. To introduce students to various construction materials, techniques and practices commonly used in civil engineering construction.
- 2. To gain understanding of properties and usage of bricks, stones, timber, and miscellaneous materials used in construction.
- 3. To expose students to the various building and general construction products and their associated quality, durability, warrantees, and availability.

- 1. Recognize the requirements and manufacturing process of cement and brick.
- 2. Demonstrate knowledge of properties of various building materials.
- 3. Develop understanding of material science and behavior of various building materials used in construction.
- 4. Understand the properties of concrete, concrete mix proportion.

S.N. Contents	riours
1Stones: Classification of rocks, test for stones, characteristics of a good building stone, deterioration of stones, common building stones of India, requirements as per Indian Standards	
Bricks: Composition of good brick earth, harmful ingredients, manufacture of bricks, characteristics of good bricks, shapes, classification of bricks as per IS 1077-1985 and testing as per Indian Standards.	
Mortar: Classifications, Properties, and tests as per Indian Standards	9
Timber: Classification and identification of timber, defects in timber, characteristics of good timber, seasoning of timber, requirements as per Indian Standards	
Tiles: Classification of tiles, test for tiles, characteristics of tiles as per Indian Standards	
Glass and glazing systems: Classification, properties, and tests as per Indian Standards	
2 Concrete Constituents:	
Cement: Constituents of cement and their role, composition of cement (Bogue's equation) hydration of cement, structure of hydrated cement, heat of hydration. Tests of cement as per IS code.	7
Aggregates: Sources, Classification, properties, and grading of aggregates. Tests on aggregates as per IS code.	
3 Concrete: Introduction, properties of concrete, water/cement ratio and its role, gel/space ratio, workability, compressive strength, grades, Production of Concrete: Properties of fresh concrete including workability, air content, flow ability, methods to determine and factors affecting. Properties of hardened concrete such as strengths, permeability, creep, shrinkage, factors influencing, standard tests on fresh and hardened concrete as per IS code.	5
4 Quality control of concrete, Concrete mix design. Admixture in Concrete: Chemical and mineral admixtures (their types and use under different	4



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	conditions). Use of fly ash and silica fume in concrete.	
5	SPECIAL CONCRETE Light weight concrete, definition and its properties, applications, high strength concrete, definitions, its properties and applications, mass concrete, waste material-based concrete, shotcrete, fiber reinforced concrete: Materials. Fibers-types and properties, ferrocement, polymer concrete composites, heavy-weight concrete for radiation shielding.	3
	Total	28

- Mehta, Scarborough, Armpriest. (2016). Building Construction: Principles, Materials, & Systems, 2nd Edition, Pearson publication, ISBN 9789332575097.
- 2. Gambhir M. L. (2004). Concrete Technology, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- 3. Shetty M. S. (2010). Concrete Technology: Theory and Practice, S. Chand & Company.
- 4. Ken, Ward-Harvey. (2009). Fundamental building materials, Universal Publisher (fourth edition).
- 5. Edward Allen, Joseph Iano. (2014). Fundamental building materials, John Wiley & Sons (Sixth Edition).





Marks: 100 (IA=30, ETE=70)

End Term Exam: 3 Hours

3CE4-04: Architecture Drawing and Building Construction

3CE4-04: Architecture Drawing and Building Construction

Credit: 3Max

3L+0T+0P

Course Objectives

- 1. To expose students to the concepts of architectural drawings and building construction.
- 2. Capable of working with an architect and contractor

- 1. Plan and draw constructional details of different building components
- 2. Prepare building plans and other components for a project
- 3. Capable of supervise building constructions

S.N.	Contents	Hours
1	Introduction to Architecture Drawing: Types of buildings Proportion, orientation, criteria for location and site selection site plan, working drawing Building layout, Architectural, structural working drawings, Modular co-ordination and drawing on modules,	
	Sun Consideration: Different methods of drawing the sun chart, sun shading devices, design of louvers, energy conservation in buildings, passive solar cooling and heating of buildings.	8
	Climatic and comfort Consideration: Elements of climate, global climate, climatic zones of India, comfort conditions, biclimatic chart, climate modulating devices.	
2	Building Bye Laws and NBC Regulations: Objective of by-laws, Regulation regarding; means of access, lines of building frontages, covered area, floor area ratio, open spaces around buildings, height & sizes of rooms, plinth regulation and sanitation provisions.	9
	Principles of Planning: Various factors affecting planning viz-aspect, prospect, furniture requirement, roominess, grouping, circulation, elegance, privacy etc.	
3	Functional design and Accommodation requirements	
	(A) Residential Buildings: Anthropometry, activities and their spatial requirements; Area planning, living area, sleeping area, service area; Bubble diagram showing sequence of arrangement of area, plan, elevation, sectional elevation.	8
	(B) Non-Residential Buildings: viz-school buildings, rest house, primary health centers, post office, bank, college library, cinema theatres etc.	
4	Foundations: Types spread, arch, combined, cantilevered, Raft, Grillage, Piles & wells, Footings in block cotton soil, Basement & Retaining walls	
	Masonry: Stone and Brick masonry, Bonds and junctions in brick masonry, Walling, Mud wall, Sun-dried bricks, burnt bricks, stone walling, load bearing & non load bearing brick masonry for multistoried constructions, brick panel walling, reinforced masonry. Bonds & junctions	8
	Prefabricated Construction: Prefabricated components, Assembly at site, Low-cost housing & hollow blocks.	
5	Damp Proof Course: Points of its requirement in buildings, Damp Proof Course at Plinth level, in basement and roof tops etc. joints in prefabricated construction. Anti termite treatment	9





 Lintels & Arches: Location and construction details in wood, brick, stone and R.C.C. Stairs and Staircases: Suitability of location, stairs in multistoried buildings, Residential and public buildings, Fire escape, Stairs in timber, stone, brick, RCC and Metal Drawings in Plan elevation and sections. Handrail & railings, description and sketches of lift escalators. Doors and Windows: Details, location in buildings, sizes & construction for wooden & metal, Battened, braced, framed, flush and paneled, sliding, folding telescopic, with louvers, collapsible. Windows in timber & Metal casement, double hung, Dormer, Corner, Fanlight, skylight, clear storey etc. Low-cost ideas, Revolving doors, Aluminum door and windows. 	
Roofing and Flooring: Types of Flooring, Flat roofs: Waffle floor, channels, cored units etc., inclined roofs. Form Work, Scaffolding, underpinning.	
Total	42

- 1. Singh, Gurcharan. (1994). Building Construction Engineering, Standard Book House.
- 2. Sharma, S. K. (2012). Building Construction, S. Chand and Company.
- 3. Kumar, Sushil, (1990). Building Construction, Standard Publisher and Distributors.
- 4. Punima, B. C. (2002). Building Construction, Laxmi Publishing House.
- 5. Sharma and Kaul. (1987). A Textbook of Building Construction, S. Chand and Company.





3CE4-05: Engineering Geology

3CE4-05: Engineering Geology

Credit: 3Max

2L+0T+0P

Course Objectives

- 1. Identify the structure of earth; distinguish between different rocks and their properties; select sites for different structures in different zones and explore subsurface using different techniques.
- 2. To demonstrate the importance of geology to take Civil Engineering decisions to solve the earth related problems.
- 3. To introduce the fundamental of the engineering properties of earth materials for the use of Civil Engineering constructions.
- 4. To develop quantitative skills and a framework for solving Engineering Geological problems.

Course Outcomes: Upon completion of this course the students will be able to:

- 1. Know about the various internal structures of earth and plate tectonic movements.
- 2. Characterize the engineering properties of rocks, minerals, and soil.
- 3. Assess the natural occurring various geological hazards.
- 4. Use seismic and electrical methods to investigate the subsurface of the earth.
- 5. Apply Remote Sensing and GIS knowledge to investigate the Geological structures.

S.N.	Contents	Hours
1	General Geology: Subdivision of Geology. Importance of Geology in Civil Engineering. Internal Structure of the Earth, physical properties of minerals, weathering and erosion. Geological work of wind, river and ocean. Stratigraphic aspects of rocks for civil engineers. Geological Time Scale.	6
2	Petrology: Origin & classification of rocks. Texture & Structures of Igneous, Sedimentary and Metamorphic Rocks. Engineering Properties of rocks. Rocks and dimensional stones as construction material. Suitability of rocks for different Civil Engineering purposes. Structural Geology: Causes & Classification of fold, fault, joints & unconformities. Outcrop pattern. Recognition of structure from rock outcrops.	6
3	Natural Disasters and Geological Investigations (in reference to Civil Engineering): Earthquake, causes, intensity scale and seismic zone of India. Site selection for dam, tunnels, multistorey buildings, reservoirs and bridge structures Sites improvement techniques practiced in different civil engineering projects. Introduction to drilling methods.	6
4	Geophysical Methods for Subsurface Exploration: Electrical resistivity methods,Geophysical survey: Seismic refraction techniques, Ground Penetrating Radar (GPR) survey	4
5	Remote Sensing: Introduction and applications in Civil Engineering. Image acquisition, image interpretation (visual and digital, digital terrain model, airborne lithological identification). Remote sensing techniques used in civil engineering domain.	6
	Total	28

Marks: 100 (IA=30, ETE=70) End Term Exam: 3 Hours





- 1. Goodman, R. E. (1993). Engineering Geology Rock in Engineering Construction", John Wiley and Sons.
- 2. Varghese, P.C. (2012). Engineering Geology for Civil Engineering PHI Learning Private Limited, New Delhi.
- 3. Parbin Singh. (2009). A Textbook of Engineering and General Geology, Katson Publishing House, Ludhiana.
- 4. David George. (2009). Engineering Geology: Principles and Practice, Springer.
- 5. Marshak Stephen, Mitra Gautum. (2017). Basic Methods of Structural Geology, Pearson.





3CE2-01: Engineering Mechanics

3CE2-01: Engineering Mechanics

Credit: 3Max

3L+0T+0P

Course Objectives

- 1. To enable students to apply fundamental laws and basic concepts of rigid body mechanics to solve problems of bodies under rest or in motion.
- 2. To enable the students to apply conditions of static equilibrium to analyze physical systems.
- 3. To compute the properties of areas and bodies.

Course Outcomes: Upon completion of this course the students will be able to:

- 1. Compute the resultant of system of forces in plane and space acting on bodies.
- 2. Predict the support-reactions and the internal forces of the members of various trusses and frames.
- 3. Analyze equilibrium problems with friction.
- 4. Apply transfer theorems to determine properties of various sections.
- 5. Analyze equilibrium of connected bodies with virtual work method.
- 6. Analyze the forces in the frames structure.

S.N.	Contents	Hours
1	STATICS OF PARTICLES Vectorial representation of forces and moments Vector Operation - Concepts of particles and rigid bodies - Composition of concurrent forces in plane - Free body diagrams - Equilibrium of rigid bodies in two and three dimensions- Moment of a force about a point and about an axis, Couple moment Reduction of a system of forces to a force and a couple	10
2	PROPERTIES OF SURFACES, MOMENTS, AND PRODUCTS OF INERTIA First moment of areas - Centre of area - Centre of gravity Moment of Inertia for areas (Second moment of area) - Parallel axis theorem - Perpendicular axis theorem - Moment of inertia for composite area - Product of inertia Mass moment of inertia	8
3	FRICTION Laws of coulomb friction - Coefficient of friction - Dry friction - Sliding (skidding) friction Ladder friction - Belt friction - Rolling resistance	4
4	KINEMATICS OF PARTICLES Principle of virtual work for a particle and rigid body Condition for equilibrium for a conservative system Stability - Particle dynamics in rectangular coordinates, cylindrical coordinates and in terms of path variables General motion of system of particles	8
5	WORK ENERGY METHODS, IMPULSE AND MOMENTUM Work Energy method	8

Marks: 100 (IA=30, ETE=70) End Term Exam: 3 Hours





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	Conservation of energy Impulse and momentum relationship - Impulsive force - Impact force Conservation of momentum - Moment of momentum equation	
6	RIGID BODY MOTION Translation and rotation of rigid bodies Kinetic energy of rigid body Work and energy relations Euler's equation of motion	4
	Total	42

- 1. Russell C Hibbeler and Ashok Gupta (2010). Engineering Mechanics: Statics and Dynamics (11th Edition), Published by Pearson Education Inc., Prentice Hall.
- 2. Meriam J.L and Kraige L.G. (2012). Engineering Mechanics, Volume I Statics, Volume II -Dynamics, 7th Edition, John Wiley & Sons, New York.
- 3. Beer, Johnston, Cornwell, and Sanghi. (2013). Vector Mechanics for Engineers: Statics and Dynamics, 10th Edition, McGraw-Companies, Inc., New York.
- 4. Rajasekaran S and Sankara Subramanian G. (2013). Fundamentals of Engineering Mechanics, 3rd Edition, Vikas Publishing House Pvt. Ltd., India.





Marks: 100(IA: 60, ETE: 40)

3CE4-20: Fluid Mechanics Lab

3CE4-20: Fluid Mechanics Lab

Credit: 1Max

0L+0T+2P

Course Objectives

- 1. To get familiar students about the usage and working principle of different instruments used in fluid mechanics.
- 2. Application of instruments to calculate various parameters such as fluid pressure, discharge, losses in pipes etc.
- 3. Calibration of instruments

Course Outcomes: Upon completion of this course the students will be able to:

- 1. Methods of discharge measurements on conduits and open channel flow.
- 2. Calibration flow measuring devices used in pipes, channels and tanks assessment.
- 3. To calculate losses in flow.
- 4. Verification and characterization of fluids flow through experiments.

S.N.	Contents
1	Introduction to various Instruments.
2	Determination of metacentric height
3	Calibration of a venturi meter.
4	Determination of frictional losses in pipes of different diameters.
5	Determination of minor losses in pipes.
6	Calibration of v- notch and rectangular notch.
7	Reynolds dye experiment for flow characterization.
8	Determination of C_c , C_v and C_d of an orifice.
9	Verification of Bernoulli's theorem.
10	Calibration of orifice meter.
11	Verify the impulse momentum equation (impact of jet).

- 1. Gupta V. P. (2019). Laboratory manual of Fluid Mechanics and Machines, CBS, ISBN-13,9788123900094.
- 2. Modi P. N. and. Seth S. M. (2019). Fluid Mechanics and Hydraulic Machines, 3rd Edition, Prentice-Hall of India.
- 3. Kumar D. S. (2013). Fluid Mechanics and Fluid Power Engineering, S.K. Katariya & Sons.





3CE4-21: Surveying Lab

3CE4-21: Surveying Lab

Marks: 100(IA: 60, ETE: 40)

Credit: 1.5Max

0L+0T+3P

Course Objectives

- 1. To understand the importance of surveying in the field of civil engineering.
- 2. To study the basics of linear/angular measurement methods like chain surveying, compass surveying.
- 3. To study the significance of plane table surveying in plan making.
- 4. To know the basics of levelling and theodolite survey in elevation and angular measurements.
- 5. To understand tacheometric surveying in distance and height measurements

Course Outcomes: Upon completion of this course the students will be able to:

- 1. Calculate angles, distances and levels
- 2. Understand the working principles of survey instruments
- 3. Estimate measurement errors and apply corrections
- 4. Interpret survey data and compute areas and volumes

S.N.	Contents
1	Preparing a plan of an area using distances / offsets with chain and tape
2	To carry out profile levelling and plot longitudinal and cross sections for road
3	Elevation measurements using trigonometric heighting using Total station
1	Geospatial data collection for planimetric mapping of an area using handheld GNSS
+	Receiver
5	Plane table survey of an area
6	Setting out curves.
7	PPK positioning with DGPS Receiver system for establishing control points
8	RTK positioning with DGPS Receiver system for an area survey
9	Total station setup using bearing and resection for locating objects
10	Layout of building in the field using Total Station and development of a wireframe model

- 1. Charles D. Ghilani & Paul R. Wolf. (2018). Elementary Surveying, Pearson.
- 2. Barry Kavanagh. (2018). Surveying Principles and Applications, Pearson.
- 3. Schoffield W., Mark Breach. (2007). Engineering Surveying, CRC Press.
- 4. Subramanian, R. (2007). Surveying and Leveling, Oxford.
- 5. Kanetkar, T.P., and Kulkarni, S.L. (2006). Surveying and Leveling Part I and II, Pune Vidhyarthi Griha Prakashan.
- 6. Punmia, B.C., Jain, Ashok Kumar and Jain, Arun Kumar, (2005). Surveying Vol. I and II, Laxmi Publications.





Marks: 100(IA: 60, ETE: 40)

3CE4-22: Computer Aided Civil Engineering Drawing

3CE4-22: Computer Aided Civil Engineering Drawing

Credit: 1.5Max

0L+0T+3P

Course Objectives

- 1. To learn the fundamentals of civil engineering drawings.
- 2. To impart knowledge and skill relevant to Building detailed drawing using computer software.
- 3. To make student able to learn to sketch and take field dimensions and to take data and transform it into graphic drawings and develop CAD skills

Course Outcomes: Upon completion of this course the students will be able to:

- 1. Prepare simple layout of buildings.
- 2. Produce working drawings for individual components like doors and windows etc.
- 3. Develop line diagram, building section, elevation, key plan, and sectional elevation.
- 4. Illustrate hand drafting any parts of a building and implement the regulations for layout of plan.
- 5. Draft the plan, elevation, and sectional view of the buildings

S.N.	Contents
1	To plan and draw working drawing of a Residential building with Site plan, Foundation plan, Plan, Two sectional elevations, Front elevation, Furniture plan, Water supply and sanitary plan, Electric fitting plan using drawing sheet
2	To design and draw a building among Primary Health Center, Primary School, Rest House, Post Office, Bank, College Library and Cinema Theatre using drawing sheet
	To study and draw the labelled sketch of different Building Components on sheets with exposure to CAD:
	1) Drawing of walls
	a. Brick and Stone masonry
	b. Cross section of external wall from foundation to parapet
	c. Partition wall, cavity wall
3	2) Pointing, Arches, Lintels and Floors
	3) Doors and Windows
	4) Stairs, Cross section of Dog legged stairs
	5) Roofs: Flat and Pitched roof (Steel truss)
	6) Development of Front Elevation and Sectional Elevation from a given plan
	7) Development of Plan, Front Elevation and Sectional Elevation from line diagram

- 1. Shah, M. G. Building Drawing. McGraw-Hill.
- 2. AutoCAD Reference Manual





- 3. Kulkarni, Dhananjay M., A. P. Rastogi, and Ashoke K. Sarkar. (2009). Engineering Graphics with AutoCAD by PHI Learning Pvt. Ltd.
- 4. Stefan Mordue. (2015). Building Information Modeling for Dummies.
- 5. Sharma & Gurucharan Singh. (2020). Civil Engineering Drawing Standard Publishers.
- 6. Sikka V. B. (2015). A Course in Civil Engineering Drawing, Kataria & Son's.
- 7. George Omura. (2021). Mastering AutoCAD.
- 8. Kulkarni, Dhananjay M., A. P. Rastogi, and Ashoke K. Sarkar. (2009). Engineering Graphics with AutoCAD by. PHI Learning Pvt. Ltd.





3CE4-23: Geology Lab

3CE4-23: Geology Lab

Marks: 100(IA: 60, ETE: 40)

Credit: 1Max

0L+0T+2P

Course Objectives

- 1. To make the students capable of studying and identify properties of rock and minerals.
- 2. Student should acquire knowledge about engineering properties of rocks and their minerals

Course Outcomes: Upon completion of this course the students will be able to:

- 1. Identify rocks and minerals.
- 2. Interpret map and able to measure strike and dip of the bedding planes.
- 3. Identify the various structural geological models.

S.N.	Contents
1	Identification of Minerals in Hand Specimen
2	Identification of Rocks in Hand Specimen
3	Physical Properties of Minerals
4	Physical Properties of Rocks
5	Subsurface analysis – Resistivity sounding.
6	Subsurface analysis – Seismic survey
7	Interpretation of Geological Map (10 Nos.)
7	Dip & Strike Problems (8 Nos.)
9	Identification of Geological features through wooden Models:
	a) Structural Geological Diagrams
	b) Petrological Diagrams
	c) Engineering Geological Diagrams

- 1. Chennakesavulu, N. (2009). Textbook of Engineering Geology", MacMillan Ltd., New Delhi.
- 2. David George. (2009). Engineering Geology: Principles and Practice, Springer.
- 3. Marshak Stephen, Mitra Gautum. (2017). Basic Methods of Structural Geology, Pearson
- 4. Parbin Singh. (2009). A Textbook of Engineering and General Geology, Katson Publishing House, Ludhiana.





3CE4-24: Civil Engineering Lab-I

Credit: 1Max

Marks: 100(IA: 60, ETE: 40)

0L+0T+2P

Course Objectives

- 1. To facilitate the understanding about the behavior of construction materials.
- 2. Understand the quality control tests for the various civil engineering materials by performing different lab tests on materials.

Course Outcomes

- 1. Evaluate various properties of the basic construction materials as per standards.
- 2. Ensure quality control while testing/ sampling and acceptance criteria.
- 3. Analyze the concrete mix design parameters.

S.N.	Contents
1	To determine the fineness of cement - IS 4031 (Part 1):1996
2	To determine, for the cement paste, the:
	(a) 'Standard Consistency' - IS 4031 (Part 4):1988
	(b) 'Initial Setting time' - IS 4031 (Part 5):1988
3	To determine the 'Specific Gravity' of the cement particles - IS 4031 (Part 11):1988
4	Determination of 'soundness of cement' - IS 4031 (Part 3):1988; and the 'compressive
	strength of cement' - IS 4031 (Part 6):1988
5	To determine the 'Specific Gravity', 'Water Absorption' and necessary adjustment for
	'Bulking' of Fine Aggregates (size<10mm) - IS 2386 (Part III):1963
6	To determine the 'Fineness Modulus' and 'Grain Size Distribution' of Fine Aggregates -
	IS 2386 (Part I):1963
7	Determination of water absorption, compressive strength, and efflorescence of bricks
8	To determine the consistency of concrete mixes of given proportion by using:
	(a) Slump Test
	(b) Compaction Factor Test
9	Determination of cube and cylinder compressive strength of concrete
10	To design a concrete mix of M-20 grade in accordance with IS 10262.
11	To design concrete mix of M-40 grade with super plasticizer in accordance with IS 10262.

- 1. Indian standard codes IS 4031 (Part 1) 1996, IS 4031 (Part 3 and Part 5) 1988, IS 2386 (Part 1 to Part 6) 1963, IS 383-2016.
- 2. M.L. Gambhir, Neha Jamwal. (2017). Building and Construction Materials: Testing and Quality Control (Lab Manual Series).