SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
---------CIVIL ENGINEERING----------

Semester/Year		IV/II		Program		B.Tech					
Subject Category	DC	Subject Code:		CE-401	Subject Name:	Fluid Mechanics – I					
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	-	2	4

Prerequisites:

Physics and Mathematics.

Course Objective:

Students are expected to learn basic concepts of fluid flow, fluid properties and relationship between them, fundamental principles of fluid mechanics (principles of continuity, momentum, and energy) as applied to fluid motions.

Course Outcomes:

After completion of the course, the student will be able to:

1. Perceive the knowledge of basic properties of fluids, different types of flows and analyze the fluid behavior under static condition
2. Apply the basic concepts to examine the behavior of fluid under kinematic and dynamic conditions
3. Perform dimensional analysis and dynamic similitude
4. Evaluate practical flow problems for pipes, open channels
5. Compare the difference between theoretical and practical values of different flow parameters and calibrate the equipments accordingly (Lab)

UNITs	Descriptions	Hrs.	CO's
I	Review of Fluid Properties: Engineering units of measurement, mass, density, specific weight, specific volume, specific gravity, surface tension, capillarity, viscosity, bulk modulus of elasticity, pressure and vapor pressure. Classification of different Fluids, Rheological Classification of Fluid. Fluid Static's: Pressure at a point, pressure variation in static fluid, Absolute and gauge pressure, manometers, Forces on plane and curved surfaces (Problems on gravity dams and Tainter gates); buoyant force, Stability of floating and submerged bodies, Relative equilibrium.	9	CO1
II	Kinematics of Flow: Path lines, streak lines, streamlines and stream tubes; Types of motion of Fluid Particles, Types of flow-ideal & real, steady & unsteady, uniform &nonuniform, flow one-, two- and three-dimensional flow, continuity equation for one- and three-dimensional flow, rotational &irrotational flow, circulation, stagnation point, separation of flow, sources & sinks, velocity potential, stream function, flow nets- their utility & method of drawing flow nets.	8	CO2
III	Dynamics of Flow: Euler's equation of motion along a streamline and derivation of Bernoulli's equation, application of Bernoulli's equation, energy correction factor, linear momentum equation for steady flow; momentum correction factor. The moment of momentum equation, forces on fixed and moving vanes and other applications. Velocity measurement (Pitot tube, Prandtl tube, current meters etc.); flow measurement (orifices, nozzles, mouth pieces, orifice meter, nozzle meter, venture meter, weirs and notches).	8	CO3

IV	Dimensional Analysis and Dynamic Similitude: Dimensional analysis, dimensional homogeneity, use of Buckingham-pi theorem, calculation of dimensionless numbers, similarity laws, specific model investigations (submerged bodies, partially submerged bodies, weirs, spillways, roto dynamic machines etc.)	8	CO4
V	Laminar Flow: Introduction to laminar & turbulent flow, Reynolds experiment & Reynolds number, relation between shear & pressure gradient, laminar flow through circular pipes, laminar flow between parallel plates, laminar flow through porous media, Stokes law, lubrication principles.	7	CO5
Guest Lectures (if any)			
Total Hours		40	

Suggestive list of experiments:

1. Verification of Energy equation
2. Calibration of venturi meter.
3. Calibration of orifice meter.
4. Calibration of Mouth Piece.
5. Calibration of Water meter.
6. Calibration Nozzle meter.
7. Determination of Cc, Cv, Cd of orifices.
8. Reynolds experiment for demonstration of stream lines & turbulent flow.
9. Determination of Friction Factor of a pipe.
10. Verification of impulse momentum principle.
11. Calibration Notches. (Rectangular & V notch)

Text Book-

1. Modi& Seth; Fluid Mechanics; Standard Book House, Delhi
2. Som and Biswas; Fluid Mechanics and machinery; TMH
3. Cengal; Fluid Mechanics; TMH
4. White; Fluid Mechanics; TMH

Reference Books-

1. Essential of Engg Hyd. By JNIK DAKE; Afrikan Network & ScInstt. (ANSTI)
2. A Text Book of fluid Mech. for Engg. Student by Franiss JRD
3. R Mohanty; Fluid Mechanics By; PHI
4. Fluid Mechanics; Gupta Pearson.
5. Dr. D.S. Kumar, Fluid Mechanics and Fluid Power Engineering

Modes of Evaluation and Rubric

Quiz, Assignment, Midterm exam, End term exam and Practical Viva.
Rubric: End term exam. Practical: 50% Quiz and 50% Viva.

List/Links of e-learning resource

https://swayam.gov.in/nd1_noc20_ce59/preview
https://nptel.ac.in/courses/112105183

Recommendation by Board of studies on	13-06-2024
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Civil Engineering

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---------CIVIL ENGINEERING----------

Semester/Year		IV/II	Program		B.Tech
Subject Category	DC	Subject Code:	CE-402	Subject Name:	Transportation Engg. I

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	-	2	4

Prerequisites:

Basic knowledge about the railway, bridge and tunnel

Course Objective:

- To know about the basic concepts and design of various components of railway engineering.
- To know about the types and functions of railway track, junctions, points and railway stations.
- To know about the basics of bridges and its components
- To know about the tunnels and its construction methods.

Course Outcomes:

After completion of the course, the student will be able to:

1. Distinguish various component of railway transportation system and geometric design of railway elements.
2. Discuss the basic concepts of bridge planning, construction and strengthening of bridges.
3. Know about the basic components and methods of tunnel construction to facilitate the transportation system.

UNITs	Descriptions	Hrs.	CO's
I	Components of Railway Engineering: Permanent way components Railway Track Gauge , Cross Section of Permanent Way - Functions of various Components like Rails, Sleepers and Ballast, Rail Fastenings, Creep of Rails, Theories related to creep, Adzing of Sleepers- Sleeper density, Rail joints.	8	CO1
II	Geometric Design of Railway Track: Alignment – Engineering Surveys - Gradients- Grade Compensation, Cant and Negative Super elevation, Cant Deficiency, Degree of Curve, safe speed on curves, Transition curve, Compound curves, Reverse curves , Extra clearance on curves, widening of gauge on curves, vertical curves, cheek rails on curves.	10	CO1
III	Turnouts & Controllers: Track layouts, Switches, Design of Tongue Rails, Crossings, Turnouts, Layout of Turnout, Double Turnout Diamond crossing, Scissors crossing. Signal Objectives, Classification Fixed signals – Stop signals, Signalling systems – Mechanical, signalling system – Electrical signalling system – System for Controlling Train Movement, Interlocking , Modern signaling Installations	7	CO1
IV	Bridge Site Investigation, surveying and Planning; Loading Standards & Component parts: Selection of site, alignment, Indian loading standards for Railways Bridges and Highway Bridges, Bridge super structure and sub-structures, abutments, piers, wing walls, return walls, approaches, floors & flooring system, choice of super structure.	7	CO2

V	Tunnels: Selection of route, Engineering surveys, alignment, shape and size of tunnel, bridge action, pressure relief phenomenon, Tunnel approaches, Shafts, pilot shafts Construction of tunnels in soft soil, hard soil and rock, Different types of lining, methods of lining, Mucking operation, Drainage and ventilation, Examples of existing important tunnels in India and abroad.	8	CO3
Guest Lectures (if any)			
Total Hours		40	

Suggestive list of experiments:

1. Aggregate Crushing Value Test
2. Determination of aggregate impact value
3. Determination of Los Angeles Abrasion value
4. Determination of penetration value of Bitumen
5. Determination of Viscosity of Bituminous Material
6. Determination of softening point of bituminous material
7. Determination of ductility of the bitumen
8. Determination of flash point and fire point of bitumen
9. Determination of stripping value of road aggregate
10. Determination of shape tests on aggregate

Text Book-

1. Chakraborty and Das; Principles of transportation engineering; PHI
2. Rangwala SC; Railway Engineering; Charotar Publication House, Anand
3. Rangwala SC; Bridge Engineering; Charotar Publication House, Anand
4. Ponnu swamy; Bridge Engineering; TMH
5. Railway Engineering by Arora & Saxena–Dhanpat Rai & Sons

Reference Books-

1. Railway Track by K.F. Antia
2. Principles and Practice of Bridge Engineering S.P. Bindra – Dhanpat Rai & Sons
3. Bridge Engineering - J.S. Alagia - Charotar Publication House, Anand
4. Railway, Bridges & Tunnels by Dr. S.C. Saxena
5. Essentials of Bridge Engg. By I.J. Victor; Relevant IS & IRC codes

Modes of Evaluation and Rubric

Quiz, Assignment, Midterm exam, End term exam and Practical Viva.
Rubric: End term exam. Practical: 50% Quiz and 50% Viva.

List/Links of e-learning resource

https://nptel.ac.in/courses/105/107/105107123/
https://nptel.ac.in/noc/courses/noc17/SEM2/noc17-ce24/
https://en.wikipedia.org/wiki/Railway_engineering
https://nptel.ac.in/courses/105/105/105105212/

Recommendation by Board of studies on	13-06-2024
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Civil Engineering Department

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---------CIVIL ENGINEERING----------

Semester/Year	III/II	Program	B.Tech
Subject Category: DC	Subject Code: CE-403	Subject Name:	Concrete Technology

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	30	10	10	150	3	-	2	4

Prerequisites:

Building Materials

Course Objective:

Students are expected to learn to understand the properties of ingredients of concrete; to study behavior of concrete in its fresh and hardened state; to study about the concrete design mix; to know about the procedures in concreting;

Course Outcomes:

After completion of the course, the student will be able to:

1. Test all the concrete materials as per IS code.
2. Determine the properties of fresh and hardened of concrete
3. Design the concrete mix using IS code methods
4. Ensure quality control while testing/ sampling and acceptance criteria
5. Design special concretes and their specific applications

UNITs	Descriptions	Hrs.	CO's
I	**Concrete Making Materials:** Cement, Fine Aggregate, Coarse aggregate, Water, Chemical & Mineral admixtures. Different test on cement as per Indian standards, Tests on aggregates as per Indian standards, Bulking of sand, Sieve analysis – Grading.	8	CO1
II	**Properties of Fresh and Hardened Concrete:** Properties of fresh concrete- Workability – different tests of workability- Factors influencing workability. Tests on hardened concrete as per IS codes – Relationship between different strengths – factors influencing strength.	8	CO2
III	**Design of Concrete Mix:** Various classical methods of concrete mix design, I.S. code method, basic considerations and factors influencing the choice of mix design, acceptance criteria for concrete, concrete mixes with Surkhi and other Pozzolanic materials.	9	CO3
IV	**Production and Quality Control of Concrete:** Production of crushed stone aggregate, batching equipments for production and concreting, curing at different temperatures, Concreting underwater hot & cold weather condition, statistical quality control, field control, Inspection & Testing of Concrete.	8	CO4
V	**Special Concretes:** Light weight concrete, Ready mix concrete, Ferrocement, Fiber reinforced concrete, Polymer concrete composites, Shotcrete, Guniting, Prestressed concrete, Heat resistant concrete, Mass concrete, Temperature control of mass concrete.	7	CO5
Guest Lectures (if any)			
Total Hours		40	

Suggestive list of experiments:

8. Testing of Cement: Consistency of cement, initial and final setting time, Fineness and Specific Gravity of cement.
9. Testing of fine aggregate: Specific Gravity, sieve analysis and zoning, bulking of fine aggregate, bulk density, silt content.
10. Testing of coarse aggregate: Specific Gravity, sieve analysis, water absorption & moisture content.
11. Concrete Mix design by IS code method (as per IS:10262-2019 & IS:456-2000)
12. Tests on Concrete- Workability tests – Slump cone test, compaction factor test, Vee-Bee consistometer test, strength tests- compressive strength, flexural strength, split tensile strength.

Text Book-

1. Properties of Concrete – A.M. Nevelli – 5th Ed, Prentice Hall Publishers, 2012.
2. Concrete Technology – M. S. Shetty – S Chand Co., Publishers – 2006.
3. Concrete Technology – M. L. Gambhir – Tata McGraw Hill Publishers – 2012.

Reference Books-

1. Concrete Technology – R.S. Varshney – Oxford& IBH publishing co.
2. Hand books on Materials & Technology - Published by BMTPC & HUDCO
3. Mohan Rai& M.P. Jai Singh; Advances in Building Materials & Construction
4. IS:456 (2000)
5. IS:10262 (2019)

Modes of Evaluation and Rubric

Quiz, Assignment, Midterm exam, End term exam and Practical Viva.
Rubric: End term exam. Practical: 50% Quiz and 50% Viva.

List/Links of e-learning resource

https://nptel.ac.in/courses/105/102/105102012/
https://nptel.ac.in/courses/105/104/105104030/
https://nptel.ac.in/courses/105/106/105106176/
https://nptel.ac.in/courses/105/105/105105106/
https://nptel.ac.in/courses/105/105/105105170/#

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Subject handled by department	Civil Engineering Department

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---------CIVIL ENGINEERING----------

Semester/Year	IV/II	Program	B.Tech
Subject Category: DC	Subject Code: CE-404	Subject Name:	Quantity Surveying & Costing

Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
60	20	10	10	-	-	-	100	3	1	-	4

Prerequisites:

Building material

Course Objective:

Students are expected to learn to know the importance of preparing the types of estimates under different conditions; to know about the rate analysis and bill preparations; to study about the specification writing; to understand the valuation of land and buildings.

Course Outcomes:

After completion of the course, the student will be able to:

1. Apply knowledge and techniques to prepare different types of estimates for different types of structures.
2. Carry out analysis of rates and bill preparation for various components of construction and utilize for calculating cost of works.
3. Apply the concept of valuation for evaluating rent of buildings

UNITs	Descriptions	Hrs.	CO's
I	Introduction: Purpose and importance of estimates, principles of estimating. Methods of taking out quantities of items of work. Mode of measurement, measurement sheet and abstract sheet; bill of quantities. Types of estimates, plinth area rate, cubical content rate, preliminary, original, revised and supplementary estimates for different projects.	8	CO1
II	Rate Analysis: Task for average artisan, various factors involved in the rate of an item, material and labour requirement for various trades; preparation for rates of important items of work. Current schedule of rates. (C.S.R.)	8	CO2
III	Detailed Estimates: Preparing detailed estimates of various types of buildings, R.C.C. works, earth work calculations for roads and estimating of culverts Services for building such as water supply, drainage and electrification.	9	CO1
IV	Cost of Works: Factors affecting cost of work, overhead charges, Contingencies and work charge establishment, various percentages for different services in building. Preparation of DPR.	8	CO2
V	Valuation: Purposes, depreciation, sinking fund, scrap value, year's purchase, gross and net income, dual rate interest, methods of valuation, rent fixation of buildings.	7	CO3
Guest Lectures (if any)			
Total Hours		40	

Text Book-

1. Quantity Surveying & Costing – B.N. Datta
2. Estimating & Costing for Civil Engg. – G.S. Birdi

Reference Books-

1. Quantity surveying & costing – Chakraborty
2. Estimating & Costing – S.C. Rangawala

Modes of Evaluation and Rubric

Quiz, Assignment, Midterm exam and End term exam.
Rubric: End term exam.

List/Links of e-learning resource

https://nptel.ac.in/courses/105/104/105104161/

https://pdfcoffee.com/estimation-amp-costing-5-pdf-free.html

Recommendation by Board of studies on	13-06-2024
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---------CIVIL ENGINEERING----------

Semester/Year		VIII/IV	Program		B. Tech
Subject Category	DC	Subject Code:	CE-405	Subject Name:	Construction Planning & Management

Maximum Marks Allotted							Contact Hours			Total Credits
Theory				Practical		Total Marks				
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work		L	T	P	
60	20	10	10	-	-	100	3	1	-	4

Prerequisites:

Building construction

Course Objective:

1. To make are students conversant with the various project planning and management techniques such as CPM, PERT, BOR and milestone charts with their applications in real life project.
2. To teach the students tender procedure, contract documents, specification of various item of civil engineering construction contract procedures, how to keep & manage accounts for civil project.
3. To make them learn, various safety programmes and techniques to any casualty on the site.
4. To explain them the concept of various equipment management tools such as waiting line model, transportation model with their application.

Course Outcomes:

After completion of the course, the student will be able to:

1. Learn and apply the principle of network analysis in real life construction projects
2. Have a good understanding of construction -equipment, contract documents, contracting methods, accounts, safety in construction, organization types and systems approach to planning
3. Manage a construction site independently

UNITs	Descriptions	Hrs.	CO's
I	**Preliminary and detailed investigation methods:** Methods of construction, form work and centring. Schedule of construction, job layout, principles of construction management, modern management techniques like CPM/PERT with network analysis.	8	CO1
II	**Construction equipment's:** Factors affecting selection, investment and operating cost, output of various equipment's, brief study of equipment's required for various jobs such as earth work, dredging, conveyance, concreting, hoisting, pile driving, compaction and grouting.	9	CO2
III	**Contracts:** Different types of controls, notice inviting tenders, contract document, departmental method of construction, rate list, security deposit and earnest money, conditions of contract, arbitration, administrative approval, technical sanction.	7	CO2

IV	**Specifications & Public Works Accounts:** Importance, types of specifications, specifications for various trades of engineering works. Various forms used in construction works, measurement book, cash book, materials at site account, imprest account, tools and plants, various types of running bills, secured advance, final bill.	8	CO3
V	**Site Organization & Systems Approach to Planning:** Accommodation of site staff, contractor's staff, various organization charts and manuals, personnel in construction, welfare facilities, labour laws and human relations, safety engineering. Problem of equipment management, assignment model, transportation model and waiting line modals with their applications, shovel truck performance with waiting line method.	8	CO3
Guest Lectures (if any)			
Total Hours		40	

Text Book-

1. Modern Construction and Management, by Prof. Frank Harris
2. Value And Risk Management: A Guide to Best Practice by Michael F. Dallas
3. Construction Equipment by Peurify
4. CPM by L.S. Srinath

Reference Books-

1. Construction Management by S. Seetharaman
2. CPM & PERT by Weist & Levy
3. Construction, Management & Accounts by Harpal Singh

Modes of Evaluation and Rubric

Quiz, Assignment, Mid-term exam and End term exam.
Rubric: End term exam.

List/Links of e-learning resource

https://nptel.ac.in/courses/105/103/105103093/

https://nptel.ac.in/courses/105/104/105104161/

Recommendation by Board of studies on	13.06.2024
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Subject handled by department	Civil Engineering

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---------CIVIL ENGINEERING----------

Semester/Year		IV/II	Program		B.Tech
Subject Category	DLC-II	Subject Code:	CE-406	Subject Name:	Engineering Geology Lab

Maximum Marks Allotted							Contact Hours			Total Credits
Theory			Practical			Total Marks				
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work	Quiz		L	T	P	
-	-	-	60	20	20	100	-	-	4	2

Suggestive list of experiments:

1 Fundamental of Geology
2 Study of Physical Properties of Minerals
3 Identification of Minerals and Rock sample
4 Megascopic Study of Rock Forming Minerals (Hand Specimen Study)
5 Megascopic Study of Igneous Rocks
6 Megascopic Study of Sedimentary Rocks
7 Megascopic Study of Metamorphic Rocks
8 Introduction to Geological Maps for different structural features.Presentation of Beds Along Section and Construction of Geological History:

Text Book-

3. Prabin Singh – “Engineering and General Geology”
4. S.K. Garg – “A text Book of Physical and Engineering Geology
5. ”Mukharjee, P.K., A text book of Geology, The World Press Pvt. Ltd.
6. Kesavulu, C., Textbook of Engineering Geology, Macmillan India Ltd, 1993, NewDelhi

Reference Books-

3. Gokhale, KVG.K and Rao, D.M., Experiments in Engineering Geology, Tata-McGraw Hill, 1981, New Delhi
4. Lilesand, T.M. and Ralph W. Keifer., Remote sensing and ImageInterpretation, John Wiley & Sons, 1987, New York.
5. Reddy, V. Engineering Geology for Civil Engineers; Oxford & IBH, 1997,New Delhi
6. Todd, D.K. Groundwater Hydrology, John Wiley & Sons, 1980, New York

Modes of Evaluation and Rubric

Lab work and Practical Viva.
Rubric: Practical: 50% Quiz and 50% Viva.

List/Links of e-learning resource

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