



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

-----**CIVIL ENGINEERING**-----

Semester/Year		I/I		Program			B.Tech				
Subject Category		ESC	Subject Code:		CEA101	Subject Name:		Basic Civil Engineering			
Maximum Marks Allotted											
Theory				Practical			Total Marks	Contact Hours			Total Credits
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:											
Nil											
Course Objective:											
Students are expected to learn the basic concepts of Civil Engineering and to think clearly and critically the solution of Engineering problems with this knowledge in their respective fields.											
Course Outcomes:											
After completion of the course, the student will be able to:											
<ol style="list-style-type: none"> 1. Understand the basic concepts and fundamental principles of Civil Engineering. 2. To enhance their understanding and apply this knowledge in their specific courses for the analysis and design problems. 											
UNITS	Descriptions							Hrs.	CO's		
I	Building Materials: Stones, bricks, cement, lime, timber-their types, properties, tests & uses, laboratory tests of concrete and mortar Materials: Workability and Strength properties of Concrete, Preparation of concrete, compaction, curing, etc.							8	CO1 & CO2		
II	Elements of Building Construction: Various components of a building and their functions, Types of foundations, Brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases - types and their suitability							8	CO1 & CO2		
III	Surveying & Positioning: Introduction to surveying Instruments - levels, theodolites, plane tables and related devices. Electronic surveying instruments etc. Measurement of distances - conventional and EDM methods, measurement of directions by different methods, measurement of elevations by different methods. Reciprocal levelling.							10	CO1 & CO2		
IV	Mapping & Sensing: Mapping details and contouring, Profile Cross sectioning and measurement of areas, volumes, application of measurements in quantity computations, Survey stations, Introduction of remote sensing and its applications.							7	CO1 & CO2		
V	Transportation Engineering: Role of Transportation in National development, Transportation Ways, Surface- Transportation and							7	CO1 & CO2		

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	Aviation, BOT & BOOT Projects for Highways, Elements of Traffic Engineering and Traffic Control		
Guest Lectures (if any)			
Total Hours		40	
Suggestive list of experiments:			
<ol style="list-style-type: none"> 1. To find the Consistency of cement. 2. To find the Initial & Final Setting time of cement. 3. To find the Fineness of cement. 4. To find the Specific Gravity of cement. 5. To find compressive strength of cement. 6. To find the Specific Gravity of sand 7. To find the sieve analysis and zoning of sand 8. To find the bulking and water absorption of sand. 9. Testing of coarse aggregate: Specific Gravity, sieve analysis, water absorption 10. To find the Water Absorption and compressive strength of Brick. 			
Text Book-			
<ol style="list-style-type: none"> 1. Building Construction by Sushil Kumar. 2. Civil Engineering materials, TTTI, Chandigarh. 3. Surveying Vol. I & II by Dr. B. C. Punamia Publication Laxmi Publication Delhi 4. Building Construction, Author: Dr. B. C. Punamia, Publisher: Laxmi Pub. Delhi 5. Engineering Material, Author: Dr. S.C. Rangwala, Publisher: Charotar Pub. House 6. Highway Engineering, Author: Khanna S. K. and Justo C. E.G., Publisher: Nemchand and Brothers 			
Reference Books-			
<ol style="list-style-type: none"> 1. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI 2. Building Materials by S.C. Rangwala-Charotar publications House, Anand 3. Building Construction by Sushil Kumar. 4. Surveying Vol. I and II, Author: S. K. Duggal, Publisher: Tata Macgraw hill Publication New Delhi 			
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			
http://www.nptel.iitm.ac.in/courses.php?branch=Civil http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT			
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		I/I		Program			B.Tech					
Subject Category	ESC	Subject Code:	CEA103	Subject Name:		Engineering Mechanics						
Maximum Marks Allotted										Contact Hours		Total Credits
Theory				Practical			Total Marks	L	T	P		
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz						
60	20	10	10	30	10	10	150	3	-	2	4	
Prerequisites:												
Physics and Mathematics.												
Course Objective:												
Students are expected to learn the basic concepts of Engineering Mechanics and to think clearly and critically the solution of Engineering problems with this knowledge in their respective fields.												
Course Outcomes:												
After completion of the course, the student will be able to:												
1. Understand the basic concepts and fundamental principles of Engineering Mechanics.												
2. To enhance their understanding and apply this knowledge in their specific courses for the analysis and design problems.												
UNITS	Descriptions							Hrs.	CO's			
I	Equilibrium of System of Forces : Force Systems Basic concepts, Particle and Rigid Body equilibrium; Coplanar-Concurrent and Non-concurrent Forces, Components in Space, Resultant, Moment of Forces and its Applications; Equilibrium of System of Forces, Free body diagrams, Equations of Equilibrium of Coplanar Systems; Static Indeterminacy, Friction-Application problems such as Impending motion of connected bodies, ladder friction & belt drives.							9	CO1 & CO2			
II	Trusses: Introduction to various types of Trusses, Analysis of forces in the members of a Perfect truss: Method of joints, Method of Section, Graphical Methods.							7	CO1 & CO2			
III	Analysis of Beams and Simple Frames : Types of Beams, loading and supports; Shear Force, Bending moment, Axial Force diagrams for various types of determinate beams and frames.							7	CO1 & CO2			
IV	Centroid and Moment of Inertia : Centroid of simple figures from first principles, centroid of composite sections; Moment of inertia of plane sections from first principles, Moment of inertia of standard sections and composite sections, Product of Inertia, Principal Moment of Inertia.							9	CO1 & CO2			
V	Kinetics of Rigid Bodies: Basic terms, general principles in dynamics; Types of motion, Instantaneous centre of rotation in plane motion and simple problems; D'Alembert's principle and its applications in plane motion and connected bodies; Work Energy							8	CO1 & CO2			

	principle and its application in plane motion of connected bodies; Kinetics of rigid body rotation		
Guest Lectures (if any)			
Total Hours		40	
Suggestive list of experiments:			
<ol style="list-style-type: none"> 1. To verify law of Polygon of forces. 2. To find the reaction at the supports of a Simply Supported Beam and verify the law of Superposition of Forces. 3. To determine the Coefficient of friction between different surfaces using a horizontal plane. 4. To find the Coefficient of friction between Rope and Drum. 5. To verify Shear Force at a given section of a Simply Supported Beam. 6. To verify Bending Moment at a given section of a Simply Supported Beam. 			
Text Book-			
<ol style="list-style-type: none"> 1. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI 2. Civil Engineering materials, TTTI, Chandigarh. 3. R.C. Hibbler- Engineering Mechanics: Statics & Dynamics 			
Reference Books-			
<ol style="list-style-type: none"> 1. Engineering Mechanics by R.K. Bansal 2. Beer & Johnston, Vector Mechanics for Engineering-Statics & Dynamics. 3. Engineering Mechanics by Bhavi Katti 			
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/122/104/122104015/ https://nptel.ac.in/courses/105/106/105106116/ https://nptel.ac.in/courses/105/106/105106201/			
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-----CIVIL ENGINEERING-----

Semester/Year		II/I		Program			B.Tech					
Subject Category		DC	Subject Code:	CE-201	Subject Name:		Building Materials & Construction					
Maximum Marks Allotted											Contact Hours	Total Credits
Theory				Practical			Total Marks	L	T	P		
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz					3	-
60	20	10	10	30	10	10	150					
Prerequisites:												
Basic knowledge to identify different types of material.												
Course Objective:												
Students are expected to learn concepts of physical properties of construction materials and their respective testing procedure & uses, components of Building Industry, principles and methods to be followed in constructing various components of a building.												
Course Outcomes:												
After completion of the course, the student will be able to:												
<ol style="list-style-type: none"> To identify various building materials and select suitable type of building material for given situation and also the emerging materials in the field of Civil Engineering construction. To select suitable type of foundation and various types of brick masonry, door and windows for buildings. Classify different types flooring and arch geometry and building repair work. 												
UNITs	Descriptions							Hrs.	CO's			
I	Stones: Occurrence, varieties, Characteristics and their testing, uses, quarrying and dressing of stones. Timber: Important timbers & their engineering properties and uses, defects in timber, seasoning and treatment, need for wood substitutes, Alternate materials for shuttering doors/windows, Partitions and structural members etc. Brick and Tiles: Manufacturing, characteristics, Classification and uses, Improved brick from inferior soils, Hand moulding brick table, Clay brick table, Flooring types of flooring and their characteristics.							9	CO1			
II	Advance Construction Materials: Use of fly ash in mortars, concrete, Fly ash bricks, stabilized mud blocks, non-erodible mud plinth, D.P.C. materials, building materials made by Industrial & agricultural waste, clay products P.V.C. materials, advance materials for flooring, doors & windows, fascia material, interiors materials for plumbing, sanitation & electrification.							8	CO1			
III	Foundation: Type of soils, bearing capacity, soil stabilization and improvement of bearing capacity, settlement and safe limits. Types of foundations, wall footings, grillage, foundations, well foundation, causes of failure and remedial measures; under reamed piles, foundation on shrinkable soils, black cotton soil, timbering for							7	CO2			

	trenches, dewatering of foundations. Hyperbolic parboiled footing, Brick arch foundation. Simple methods of foundation design, Damp proof courses, Repairs Techniques for foundations.		
IV	Masonry and Walls: Brick masonry, Bonds, Jointing, Stone masonry, casting and laying, masonry construction, Brick cavity walls, code provisions regarding load bearing and non-load bearing walls. Common defects in construction and their effect on strength and performance of walls, designed Brick masonry, precast stone masonry block, Hollow concrete block, plastering and pointing, white and colour washing, distemping, dampness and its protection, Design of hollow block masonry walls. Doors, Windows and Ventilators: Types, based on material etc., size location, fittings, construction of sunshades, sills and jambs, RCC doors/windows frames. Types of stair cases, rule of proportionality etc., Repairs techniques for masonry, walls, doors & windows.	8	CO2
V	Floors and Roofs: Types, minimum thickness, construction, floor finishes, Flat roofs, RCC jack arch, reinforced brick concrete, solid slab and timber roofs, pitched roofs, false ceiling, roof coverings, Channel unit, cored unit, Waffle unit, Plank and Joist, Brick panel, L-Panel, Ferrocement roofing units, water proofing. Services: Water supply & Drainage, Electrification, Fire protection, thermal insulation, Air Conditioning, Acoustics & Sound insulation, Repairs to damaged & cracked buildings, techniques and materials for low-cost housing., Repairs techniques for floors & roofs.	8	CO3
Guest Lectures (if any)			
Total Hours		40	
Suggestive list of experiments:			
<ol style="list-style-type: none"> 1. Testing of Cement: Consistency of cement, initial and final setting time, Fineness, Specific Gravity and compressive strength of cement. 2. Testing of fine aggregate: Specific Gravity, sieve analysis and zoning, bulking of fine aggregate, bulk density, silt content. 3. Testing of coarse aggregate: Specific Gravity, sieve analysis, water absorption & moisture content. 4. Test on Bricks: Water Absorption and compressive strength of Brick. 5. Test on Tiles: Water Absorption and Flexural strength of Tiles. 6. Tension test on mild steel and HYSD bars. 7. Bending Test on Wood under two point loading. 			
Text Book-			
<ol style="list-style-type: none"> 1. Mohan Rai & M.P. Jai Singh; Advance in Building Materials & Construction, 2. S.C. Rangwala; Engineering Materials 3. Sushil Kumar; Building Construction, 4. B.C. Punmia; Building Construction, 			
Reference Books-			
<ol style="list-style-type: none"> 1. Building Construction, Metcchell 2. Construction Technology, Chudley R. 3. Civil Engineering Materials, N. Jackson. 4. Engineering Materials, Surendra Singh. 			
Modes of Evaluation and Rubric			

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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/105/102/105102088/>

<https://nptel.ac.in/courses/105/106/105106206/>

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

Semester/Year		II/I		Program			B.Tech				
Subject Category	DC	Subject Code:	CE-202	Subject Name:		Engineering Geology					
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks	L	T	P	
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work	Quiz					
60	20	10	10	30	10	10	150	3	-	2	4
Prerequisites:											
Nil											
Course Objective:											
<p>The objective of this Course is</p> <ul style="list-style-type: none"> To study and identify different types natural materials like rocks & minerals and soil. To understand the various natural dynamic processes their influence on the surficial features, natural material and their consequences. To know the physical properties of rocks & minerals. To know the importance of geological maps and language helpful for Civil Engineering projects 											
Course Outcomes:											
<p>After completion of the course, the student will be able to:</p> <ol style="list-style-type: none"> Site characterization and how to collect, analyze, and report geologic data using standards in engineering practice The fundamentals of the engineering properties of Earth materials and fluids. Rock mass characterization and the mechanics of planar rock slides and topples. 											
UNITS	Descriptions							Hrs.	CO's		
I	Introduction and Physical Geology: Introduction and scope of Geology, Geology in civil engineering, branches of geology, structure of earth and its composition, weathering of rocks, scale of weathering, soils, landforms and processes associated with river, wind, groundwater and sea, relevance to civil engineering. Plate tectonics, Earth quakes, Seismic zones in India.							9	CO1		
II	Mineralogy: Fundamentals of mineralogy, study of common rock forming minerals, ores and minerals of economic importance to civil engineering.							8	CO1		
III	Petrology: Rocks and their formation, classification of rocks, distinction between Igneous, Sedimentary and Metamorphic rocks. Engineering properties of rocks. Rocks of civil engineering importance.							7	CO2		
IV	Structural Geology: Structures related to rocks, Dip, Strike and outcrops, Classification and detailed studies of geological structures i.e. folds, Faults, Joints, Unconformity and their importance in Civil Engineering.							8	CO2		
V	Application of Geological Investigations: Remote sensing for civil engineering applications; Geological conditions necessary for design							8	CO3		

	and construction of Dams, Reservoirs, Tunnels, and Road cuttings — Hydrogeological investigations and mining — Coastal protection structures. Investigation of Landslides, causes and mitigation.		
Guest Lectures (if any)			
Total Hours		40	
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-			
1. Prabin Singh – “Engineering and General Geology” 2. S.K. Garg – “A text Book of Physical and Engineering Geology 3. ”Mukharjee, P.K., A text book of Geology, The World Press Pvt. Ltd. 4. Kesavulu, C., Textbook of Engineering Geology, Macmillan India Ltd, 1993, NewDelhi 5. Bangar, K.M, Principles of Engineering Geology, Standard Publishers Distributors, 1995, New Delhi 6. Billings, M.P., Structural Geology, Prentice-Hall India, 1974, New Delhi 7. Blyth, F.G.H and de Freitas, M.H. Geology for Engineers, ELBS, 1974London			
Reference Books-			
1. Gokhale, KVG.K and Rao, D.M., Experiments in Engineering Geology, Tata-McGraw Hill, 1981, New Delhi 2. Lilesand, T.M. and Ralph W. Keifer., Remote sensing and ImageInterpretation, John Wiley & Sons, 1987, New York. 3. Reddy, V. Engineering Geology for Civil Engineers; Oxford & IBH, 1997,New Delhi 4. Todd, D.K. Groundwater Hydrology, John Wiley & Sons, 1980, New York			
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			
1. http://nptel.iitm.ac.in/video.php?subjectId=105105106 2. http://nptel.iitm.ac.in/courses.php?branch=Civil , 3. http://nptel.iitm.ac.in/video.php?courseId=1055&p=1 4. http://nptel.iitm.ac.in/video.php?courseId=1055&p=3 5. http://nptel.iitm.ac.in/video.php?courseId=1055&p=4			
Recommendation by Board of studies on		13-06-2024	
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