



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

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

Semester/Year		VI/III	Program				B.Tech				
Subject Category	DC	Subject Code:	CE-601	Subject Name:			Structural Design & Drawing –II (Steel)				
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:											
Structural Design & Drawing –I											
Course Objective:											
Students are expected to learn design of steel structural elements under compression, tension and flexure using various types of cross-sections as per the provisions of IS 800-2007 code of practice along with bolted and welded connections. They should attain competence to solve real life problems of simple steel structures employed in commercial and industrial buildings.											
Course Outcomes:											
After completion of the course, the student will be able to:											
<ol style="list-style-type: none"> 1. understand the basic concepts of steel structure design and apply the IS code of practices for design of steel structural elements. 2. design and evaluate different steel structural elements in compression, tension and flexure on the basis of strength and serviceability concepts as per IS:800-2007. 3. design riveted, bolted and welded connections for both axial and eccentric loads. Also, design and evaluate grillage foundation and footings for different steel structures. 4. solve and provide solutions to the real-world problems. 											
UNITS	Descriptions							Hrs.	CO's		
I	Various loads and mechanism of the load transfer, Partial load factors, Structural properties of steel, Structural Steel Products, Design Philosophies, Principles of Limit State Design, Design of structural connections - Bolted, Riveted and Welded connections.							9	CO1		
II	Design of compression members, Tension members, Roof Trusses - Angular & Tubular, Lattice Girders.							9	CO2		
III	Design of simple beams - Laterally Supported and Unsupported, Design of Beam Bearing plates, Built-up beams, Plate girders and Gantry girders, Splices in beams							6	CO2		
IV	Length of Columns, Design of Simple and Compound Columns, Lacing & battens, Bracings.							9	CO3		
V	Design of footings for steel structures, Grillage foundation. Design of Industrial Buildings - Structural framing, Roofing and Wall Materials, Purlins, Girts and Eave Strut, Floor plates and End Bearings							7	CO4		
Guest Lectures (if any)											
Total Hours								40			
Suggestive list of experiments:											
1. Design & Drawing of Bolted and Welded Connections.											

2. Design & Drawing of Compression and Tension members.
3. Design & Drawing of Laterally supported and unsupported Beams.
4. Design & Drawing of Plate Girder
5. Design & Drawing of Built-up Columns (Lacing system and Battening system).
6. Design & Drawing of Flat column base and Gusseted column base.
7. Design & Drawing of Roof Trusses.
8. Design & Drawing of Grillage foundation.
9. Design & Drawing of Gantry Girder.
10. Design & Drawing of an Industrial Building.

Text Book-

1. Design of Steel Structures, N. Subramanian, Oxford University Press
2. Limit State Design of Steel Structures, S. K. Duggal, McGraw Hill(India) Education Pvt. Ltd.

Reference Books-

1. Fundamentals of Structural Steel Design, M. L. Gambhir, McGraw Hill(India) Education Pvt. Ltd.
2. Design of Steel Structures, S. S. Bhavikatti, I. K. International Publishing House Pvt. Ltd.

Modes of Evaluation and Rubric

Quiz, Assignment, Mid-term 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/105/105/105105162/>

<https://nptel.ac.in/courses/105/106/105106113/>

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		VI/III	Program				B.Tech				
Subject Category	DC	Subject Code:	CE-602	Subject Name:		Geotechnical Engineering – I					
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:											
Geology											
Course Objective:											
To provide students with basic understanding of physical and mechanical properties of soil, together with knowledge of basic engineering procedures to identify factors controlling soil behaviour and methods to determine soil properties. Students will acquire basic knowledge in engineering design of geotechnical systems											
Course Outcomes:											
At the end of the course, the student will be able to:											
<ol style="list-style-type: none"> 1. Characterize and classify soils. 2. Compute and analyse the permeability and seepage of water. 3. Understand the principles of compaction and its control. 4. Analyse the stress distribution and identify shear strength parameters for field condition. 											
UNITs	Descriptions							Hrs.	CO's		
I	Basic Definitions & Index Properties: Definition and scope of soil mechanics, Historical development, Formation of soils, Soil composition, Minerals, Influence of clay minerals on engineering behaviour, Soil Structure, three phase system, Index properties and their determination, Consistency limits, Classification systems based on particle size and consistency limits.							9	CO1		
II	Soil Water and Permeability: Soil water, Permeability Determination of permeability in laboratory and in field. Seepage and seepage pressure. Flow-nets, uses of a flow-net, Effective, neutral and total stresses.							8	CO2		
III	Compaction: Compaction, Field and laboratory methods, Proctor compaction tests, Factors affecting compaction, Properties of soil affected by compaction, Various equipment for field compaction and their suitability, Field compaction control, Lift thickness.							7	CO3		
IV	Effective Stress Distribution in Soils: Stress distribution beneath loaded areas by Boussinesq and westergaard's analysis, Newmark's influence chart, Contact pressure distribution.							8	CO4		
V	Shear Strength of Soils: Coulomb's theory of shear failure of soils, Mohr's stress circle, Measurement of shear strength, Shear box test, Tri-axial compression test, unconfined compression test, Vane shear test, Measurement of pore pressure, pore pressure parameters, critical void ratio, Liquefaction							8	CO4		

Guest Lectures (if any)		
Total Hours	40	
Suggestive list of experiments:		
Objective:		
To understand the laboratory tests used for determination of physical, index and engineering properties of soil.		
<ol style="list-style-type: none"> 1. Determine the Water Content and Specific Gravity. 2. Course and find Sieve Analysis 3. Determine the Atterberg Limits (Liquid Limits and Plastic Limits) 4. Determine the Shrinkage Limit 5. Hydrometer Analysis 6. Determine the Permeability test (Constant and variable) 7. Conduct the Direct Shear Test 8. Conduct the Standard Proctor Compaction Test. 9. Conduct the Heavy Compaction Test. 		
Text Book-		
<ol style="list-style-type: none"> 1. Soil Mech. & Found. Engg. by Dr. K.R. Arora - Std. Publishers Delhi. 2. Soil Mech. & Found. By Dr. B.C.Punmia- Laxmi Publications, Delhi. 3. Geotech Engg. By Dr.Alam Singh - IBT Publishers, Delhi. 		
Reference Books-		
<ol style="list-style-type: none"> 1. Geotech Engg. by C. Venkatramaiah - New Age International Publishers, Delhi 2. Soil Mech. & Found. Engg. by Ranjan Rao and Gupta, New Age 3. Soil Testing for Engg. by T.W. Lambe - John Wiley & Sons. Inc. 4. Relevant I.S. Codes 		
Modes of Evaluation and Rubric		
Quiz, Assignment, Mid-term 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/105/101/105101201/		
https://nptel.ac.in/courses/105/105/105105168/		
Recommendation by Board of studies on	13-06-2024	
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-----CIVIL ENGINEERING-----

Semester/Year		V/III	Program			B.Tech					
Subject Category	DC	Subject Code:	CE-603	Subject Name:		Environmental Engineering-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	3	-	2	4	
Prerequisites:											
Chemistry											
Course Objective:											
<ol style="list-style-type: none"> 1. To understand the basic characteristics of water audit determination in the laboratory. 2. To provide adequate knowledge about the water treatment process and its design. 3. To expose the student to understanding the design of water supply lines, and distribution systems. 4. To make the students capable of preparing a water supply project 											
Course Outcomes:											
After completion of the course, the student will be able to: CO1: Define and explain water demand and identify the sources of water CO2: Identify and discuss the various characteristics of water CO3: Apply the guidelines for the design of water treatment units CO4: Describe the unit operations and process for water treatment CO5: Classify water distribution networks and Identify pipe appurtenances											
UNITs	Descriptions						Hrs.	CO's			
I	Need for protected water supply, essentials of water supply, project documents preparation. Sources of water- Different sources of water Quantity of water - Population forecasting - different methods, rate of demand - factors affecting and its variation.						10	CO-1			
II	Intakes/water-borne diseases and their control, conveyance of water (Pump capacity, Economic diameter). Quality of water - Physical, chemical, and biological characteristics, analysis of water, and drinking water standards.						08	CO-2			
III	Treatment of water - Aeration of water - types of aerators, theory of sedimentation, sedimentation with coagulation, coagulants, feeding devices, mixing devices, flocculation - design considerations.						08	CO-3			
IV	Unit operations and Unit process- Filtration - types of filters - design considerations. Disinfection – theory, methods of disinfections, chlorination. Other treatment methods - softening of water, Removal of iron and manganese, defluoridation, desalination.						08	CO-4			
V	Distribution of water - distribution methods, systems of supply, service reservoirs and their capacity, layouts of distribution. 04 Pipe appurtenances: service connection, location of water supply pipes in buildings. wastage of water - Leakage detection & prevention, corrosion, and its prevention.						06	CO-5			

Guest Lectures (if any)			
Total Hours		40	
Suggestive list of experiments:			
<ol style="list-style-type: none"> 1. To study the various standards for water and wastewater. 2. To study sampling techniques for water and wastewater. 3. Measurement of turbidity. 4 To determine the conc. of chlorides in a given water sample. 5. Determination of hardness of the given sample. 6. Determination of residual chlorine by "Chloroscope". 7. Determination of Alkalinity in a water sample. 8. Determination of Acidity in a water sample. 9. Determination of Dissolved Oxygen (DO) in the water sample. 10. Determination of BOD in the wastewater sample 			
Text Book-			
<ol style="list-style-type: none"> 1. Water Supply Engineering by B.C. Punmia - Laxmi Publications (P) Ltd. New Delhi 2. Water Supply & Sanitary Engg. by G.S. Birdi - Laxmi Publications (P) Ltd. New Delhi. 3. Environmental Engg.-I, by Garg S.K., Khanna Publishers, New Delhi 			
Reference Books-			
<ol style="list-style-type: none"> 1. Manual on water supply and treatment CPHEEO, Ministry of Urban Development, New Delhi 1991. 2. Birdie G.S., Water Supply and Sanitary Engg., Dhanpath Rai and Sons, New Delhi 1987. 3. B.C. Punmia, Water Supply, and Sanitary Engg., Dhanpath Rai and Sons, New Delhi. 4. Modi and Sethi, Water Supply and Sanitary Engg., Dhanpath Rai and Sons, New Delhi. 5. Water & Waste Water Technology by Mark J. Hammer - Prentice - Hall of India, New Delhi 6. Environmental Engineering - H.S. Peavy & D.R. Rowe - McGraw Hill Book Company, New Delhi 7. Water Supply & Sanitary Engg. by S.K. Husain 4. Water & Waste Water Technology - G.M. Fair & J.C. Geyer 5. 			
Modes of Evaluation and Rubric			
Quiz, Assignment, Mid-term 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/103/107/103107084/ https://nptel.ac.in/noc/courses/noc19/SEM2/noc19-ge22/			
Recommendation by Board of studies on		13-06-2024	
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Semester/Year		VI/III		Program			B.Tech			
Subject Category	DC	Subject Code:	CE-604	Subject Name:	Hydrology & Water Resource Engineering					
Maximum Marks Allotted							Contact Hours			Total Credits
Theory				Practical		Total Marks	L	T	P	
End Sem	Mid-Sem	Assignment	Quiz	End Sem	Lab-Work					
60	20	10	10	-	-	100	3	-	-	3
Prerequisites:										
Fluid mechanics and Engineering Mathematics.										
Course Objective:										
<ol style="list-style-type: none"> 1. Student will understand the Role of the Water resources in Development of human civilization and sustainability. Student will learn the concept, theory and principle related to Hydrological cycle and application of water for irrigation purpose. Student will learn Data Collection techniques related to various parameter like precipitation, Runoff and losses. 2. Student will learn Analysis of Data, its interpretation and use for forecasting and related problems. 3. Student will learn Design of the Structures for Flood control, Canals, Wells etc 										
Course Outcomes:										
After completion of the course, the student will be able to:										
<ol style="list-style-type: none"> 1. Understand the Role of the Water resources in human civilization and its development. Demonstrate concept, theory and principle related to Hydrological cycle and application of water for irrigation purpose. Understand the data Collection techniques related to various parameter like precipitation, Runoff and losses. 2. To acquire aptitude for Analysis of Data, its interpretation and use for forecasting related problems. 3. Design the Structures for Flood control, Canals, Wells.etc 										
UNITS	Descriptions						Hrs.	CO's		
I	Hydrology : Hydrological cycle, precipitation and its measurement, recording and non-recording rain gauges, estimating missing rainfall data, rain gauge networks, mean depth of precipitation over a drainage area, mass rainfall curves, intensity-duration curves, depth-area duration curves, Infiltration and infiltration indices, evaporation stream gauging, run off and its estimation, hydrograph analysis, unit hydrograph and its derivation from isolated and complex storms, S-curve hydrograph, synthetic unit hydrograph.						15	CO1/CO2		
II	Floods and Ground water : Types of floods and their estimation by different methods, probability and frequency analysis, flood routing through reservoirs and channels, flood control measures, economics of flood control, confined and unconfined aquifers, aquifer properties, hydraulics of wells under steady flow conditions, infiltration galleries. Ground water recharge-necessity and methods of improving ground water storage. Water logging-causes, effects and its prevention. Salt						5	CO1/CO2		

	efflorescence-causes and effects. reclamation of water logged and salt affected lands.		
III	Water resources planning and management: Planning of water resources projects, data requirements, economic analysis of water resources projects appraisal of multipurpose projects, optimal operation of projects introduction to linear programming and its application to water resources projects. Role of water in the environment, rain water harvesting, impact assessment of water resources development and managerial measures.	8	CO1/CO2
IV	Canal irrigation: Types of canals, alignment, design of unlined and lined canals, Kennedy's and Lacey's silt theories, typical canal sections, canal losses, linings-objectives, materials used, economics. Canal falls & cross drainage works, - description and design, head and cross regulators. escapes and outlets, canal transitions.	7	CO1/CO3
V	Well irrigation: Types of wells, well construction, yield tests, specific capacity level and specific yield, hydraulic design of open wells and tube wells, methods of raising well water, characteristics of pumps and their selection, interference of wells, well losses, advantages and disadvantages of well irrigation.	5	CO1/CO2 CO3
Guest Lectures (if any)			
Total Hours		40	
Text Book-			
<ol style="list-style-type: none"> 1. Hydrology Engg. Hydrology - J.NEMEC - Prentice Hall 2. Hydrology for Engineers Linsley, Kohler, Paulnus - Tata Mc.Graw Hill. 3. Engg. Hydrology by K. Subramanya - Tata McGraw Hills Publ. Co. 4. Hydrology & Flood Control by Santosh Kumar - Khanna Publishers 5. Engg. Hydrology by H.M. Raghunath 6. A Text book of Hydrology-Dr.P.Jaya Rami Reddy-University Science press 			
Reference Books-			
<ol style="list-style-type: none"> 1. Irrigation & Water Power Engg. - Dr. B.C. Punmia, Dr. Pande, B.B. Lal 2. Irrigation, Water Resources & Water Power by Dr. P.N. Modi 3. Irrigation Engineering by Varshney 4. Irrigation Engineering by Santosh Kumar Garg 5. Irrigation, Water Power & Water Resources Engg. by K.R. Arora 			
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/105/104/105104103/ https://nptel.ac.in/courses/105/105/105105110/			
Recommendation by Board of studies on		13.06.2024	
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-----CIVIL ENGINEERING-----

Semester/Year		VI/III	Program			B.Tech					
Subject Category	DE-II (A)	Subject Code:	CE-605 DE-II (A)	Subject Name:	Structural Analysis – II						
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	-	-	-	100	3	-	-	3
Prerequisites:											
Structural Analysis – I											
Course Objective:											
<ol style="list-style-type: none"> 1. To analyse and evaluate systems in structural engineering using various force and displacement methods. 2. Approximate analysis of structures for gravity and lateral loads, matrix flexibility and stiffness methods of structural analysis. 3. Students can state computer implementation of the structural engineering problems. 4. Perform plastic analysis of various structures. 5. Students will be competent to provide solution for most of the real life structural Engineering problems.. 											
Course Outcomes:											
After completion of the course, the student will be able to:											
<ol style="list-style-type: none"> 1. Understand various classical and matrix methods of structural analysis for determinate and indeterminate structures. 2. Perform analysis of various civil engineering structures for static and dynamic loadings. 3. Analyse beams and frames using plastic analysis. 4. Draw influence line diagrams for statically determinate & indeterminate structure. 											
UNITs	Descriptions							Hrs.	CO's		
I	Moment distribution method in analysis of frames with sway, analysis of box frames, analysis of portals frames with inclined members. Analysis of beams, sway and non-sway frames by Kani's method.							9	CO2		
II	Analysis of tall frames, wind and earthquake loads, codal provisions for lateral loads, Approximate analysis of multistory frames for vertical and lateral loads.							9	CO2		
III	Matrix methods of structural analysis: Flexibility Method & Stiffness Method for beams and trusses.							8	CO1		
IV	Plastic analysis of beams and frames.							7	CO3		
V	Influence lines for indeterminate structures, Muller-Breslau's principle, Analysis of Beam-Columns.							7	CO4		
Guest Lectures (if any)											
Total Hours								40			

LIST OF EXPERIMENTS:

Reference Books-

1. Wang C.K., Intermediate structural analysis, McGraw Hill, New York.
2. Kinney Sterling J. Indeterminate structural Analysis, Addison Wesley.
3. Reddy C.S., Basic Structural Analysis, Tata McGraw Hill Publishing Company, New Delhi.
4. Norris C.H., Wilbur J.B. and Utkys, Elementary Structural Analysis, McGraw Hill International, Tokyo.
5. Ghali A and Neville M, Structural Analysis-A unified classical and Matrix Approach, Chapman & Hall, New York.
6. Weaver W. & Gere J.M., Matrix Methods of Framed Structures, CBS Publishers & Distributors, Delhi

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/105/105/105105109/>

<https://nptel.ac.in/courses/105/101/105101086/>

<https://nptel.ac.in/courses/105/106/105106050/>

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

Semester/Year		VI/III		Program			B.Tech				
Subject Category		DE-II (B)		Subject Code: CE-605 DE-II (B)		Subject Name:		Structural Dynamics			
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	-	-	-	100	3	-	-	3
Prerequisites:											
Structural Analysis											
Course Objective:											
The main objective of the course is to introduce dynamic loading and the dynamic performance of the structures to the students. Different types of dynamic loading also to be discussed. The detailed study on the performance of structures under earthquake loading is also one of the focus of the course.											
Course Outcomes:											
At the end of the course, student will have the knowledge to analyse structures subjected to dynamic loading and to design the structures for seismic loading as per code provisions.											
UNITS	Descriptions							Hrs.	CO's		
I	THEORY OF VIBRATIONS Difference between static loading and dynamic loading – Degree of freedom – idealisation of structure as single degree of freedom system – Formulation of Equations of motion of SDOF system - D'Alemberts principles – effect of damping – free and forced vibration of damped and undamped structures – Response to harmonic and periodic forces.							9	CO1		
II	MULTIPLE DEGREE OF FREEDOM SYSTEM Two degree of freedom system – modes of vibrations – formulation of equations of motion of multi degree of freedom (MDOF) system - Eigen values and Eigen vectors – Response to free and forced vibrations - damped and undamped MDOF system – Modal superposition methods.							9	CO1		
III	ELEMENTS OF SEISMOLOGY Elements of Engineering Seismology - Causes of Earthquake – Plate Tectonic theory – Elastic rebound Theory – Characteristic of earthquake – Estimation of earthquake parameters - Magnitude and intensity of earthquakes – Spectral Acceleration.							6	CO1		
IV	RESPONSE OF STRUCTURES TO EARTHQUAKE Effect of earthquake on different type of structures – Behaviour of Reinforced Cement Concrete, Steel and Pre stressed Concrete Structure under earthquake loading – Pinching effect – Bouchinger Effects – Evaluation of earthquake forces as per IS:1893 – 2002 - Response Spectra – Lessons learnt from past earthquakes.							9	CO1		
V	DESIGN METHODOLOGY							7	CO1		

	Causes of damage – Planning considerations / Architectural concepts as per IS:4326 – 1993 – Guidelines for Earthquake resistant design – Earthquake resistant design for masonry and Reinforced Cement Concrete buildings – Later load analysis – Design and detailing as per IS:13920 – 1993.		
Guest Lectures (if any)			
Total Hours		40	
Text Book-			
1. Chopra, A.K., “Dynamics of Structures – Theory and Applications to Earthquake Engineering”, 4th Edition, Pearson Education, 2011.			
Reference Books-			
1. Agarwal. P and Shrikhande. M., "Earthquake Resistant Design of Structures", Prentice Hall of India Pvt. Ltd. 2007			
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/105/106/105106151/			
https://nptel.ac.in/courses/105/101/105101209/			
Recommendation by Board of studies on		13-06-2024	
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-----CIVIL ENGINEERING-----

Semester/Year		VI/III	Program				B.Tech				
Subject Category	DE-II (C)	Subject Code:	CE-605 DE-II (C)	Subject Name:			Precast and modular 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					
60	20	10	10	-	-	-	100	3	-	-	3
Prerequisites:											
Pre stress Concrete											
Course Objective:											
At the end of this course the student shall be able to appreciate modular construction, industrialized construction and shall be able to design some of the prefabricated elements and also have the knowledge of the construction methods using these elements.											
Course Outcomes:											
The student shall be able to design some of the prefabricated elements and also have the knowledge of the construction methods in using these elements											
UNITs	Descriptions							Hrs.	CO's		
I	INTRODUCTION Need for prefabrication – Principles – Materials – Modular coordination Standardization – Systems – Production – Transportation – Erection.							8	CO1		
II	PREFABRICATED COMPONENTS Behaviour of structural components – Large panel constructions – Construction of roof and floor slabs – Wall panels – Columns – Shear walls							8	CO1		
III	DESIGN PRINCIPLES Disuniting of structures- Design of cross section based on efficiency of material used – Problems in design because of joint flexibility – Allowance for joint deformation.							8	CO1		
IV	JOINT IN STRUCTURAL MEMBERS Joints for different structural connections – Dimensions and detailing – Design of expansion joints							8	CO1		
V	DESIGN FOR ABNORMAL LOADS Progressive collapse – Code provisions – Equivalent design loads for considering abnormal effects such as earthquakes, cyclones, etc., - Importance of avoidance of progressive collapse							8	CO1		
Guest Lectures (if any)											
Total Hours								40			
Text Book-											
1. CBRI, Building materials and components, India, 1990											
2. Gerostiza C.Z., Hendrikson C. and Rehat D.R., Knowledge based process planning for construction and manufacturing, Academic Press Inc., 1994											
Reference Books-											

1. CBRI, Building materials and components, India, 1990
2. Gerostiza C.Z., Hendrikson C. and Rehat D.R., Knowledge based process planning for construction and manufacturing, Academic Press Inc., 1994

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/124/105/124105013/>

<https://nptel.ac.in/courses/105/106/105106117/>

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

Semester/Year		III/II		Program			B.Tech					
Subject Category	OE-II (A)	Subject Code:	OE-606 OE-II (A)	Subject Name:	Environmental Impact Assessment							
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	-	-	-	100	3	-	-	3	
Prerequisites:												
Basic knowledge on the effects and impacts of Transportation Projects on environment												
Course Objective:												
To provide the basic knowledge on environmental impact assessment of Transportation projects and												
<ul style="list-style-type: none"> • List and define various indicators such as terrestrial subsystems, Indicators aquatic sub systems, Socio-economic and able to Select various indicators for EIA studies. 												
Course Outcomes:												
After the completion of the course the student should be able to												
<ol style="list-style-type: none"> 1. To describe the environmental imbalances, indicators and explain the concept of EIA 2. To identify and describe elements to be affected by the proposed developments and/or likely adverse impacts to the proposed project, including natural and man-made environment; 3. To identify the negative impacts and propose the provision of infrastructure or mitigation measures 												
UNITs	Descriptions							Hrs.	CO's			
I	Introduction Environment and its components, Concept of Ecological imbalances, carrying capacity and sustainable development							9	CO1			
II	EIA Procedure - Scoping & Screening Evolution of environmental impact assessment (EIA), Current screening process in India. A step-by-step procedure for developing EIA, Elements of Environmental Analysis.							8	CO1			
III	EIA Methodologies and Impact Identification Public consultation, Post monitoring, Data collection for Air Quality Impact analysis, Environmental health impact assessment, Environmental risk analysis, Economic valuation methods, Cost-benefit analysis							7	CO2			
IV	Prediction & Assessment of Impacts on the Water and Soil Environment Water Quality Impact Analysis and energy impact analysis, Impact Analysis of Water resources projects, Prediction & Assessment of Impacts on the Soil Environment							8	CO2			
V	EIA Case Studies, EIA Reporting & Review of EIA Case studies of Industrial and other EIA projects, Brief introduction about Environment legislation and Environmental Audit, Practical applications of EIA methodologies.							8	CO3			
Guest Lectures (if any)												

Total Hours	40
Text Book-	
<ol style="list-style-type: none"> 1. Jain, R.K., Urban, L.V., Stracy, G.S., (1991), "Environmental Impact Analysis", Van Nostrand Reinhold Co., New York 2. Rau, J.G. and Wooten, D.C., (1996), "Environmental Impact Assessment", McGraw Hill Pub. Co., New York 3. Canter, L.W., (1997), "Environmental Impact Assessment", McGraw Hill Pub. Co., New York 3. Grand Jean, E. Gilgen A., "Environmental Factors in Urban Planning", Taylor and Francis Limited, London, 1976. 4. UNESCO, (1987), "Methodological Guidelines for the Integrated Environmental Evaluation of Water Resources Development", UNESCO/UNEP, Paris 	
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://onlinecourses.nptel.ac.in/noc24_ar03/preview	
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



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	OE-II (B)	Subject Code:	OE-606 OE-II (B)	Subject Name:			Remote Sensing & GIS				
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	-	-	-	100	3	-	-	3
Prerequisites:											
Surveying											
Course Objective:											
To Know the concepts of Remote Sensing, its interpreting Techniques and concepts of Digital images know the concept of Geographical Information System (GIS), coordinate system GIS Data and its types, Understand the students managing the spatial Data Using GIS. Understand Implementation of GIS interface for practical usage.											
Course Outcomes:											
After completion of the course, the student will be able to:											
<ol style="list-style-type: none"> 4. Describe different concepts and terms used in Remote Sensing and its data 5. Understand the Data conversion and Process in different coordinate systems of GIS interface 6. Evaluate the accuracy of Data and implementing a GIS 7. Understand the applicability of RS and GIS for various applications. 											
UNITs	Descriptions							Hrs.	CO's		
I	Concepts of Remote Sensing Basics of remote sensing- elements involved in remote sensing, electromagnetic spectrum, remote sensing terminology & units, energy resources, energy interactions with earth surface features & atmosphere, atmospheric effects, satellite orbits, Sensor Resolution, types of sensors. Remote Sensing Platforms and Sensors, IRS satellites. Remote Sensing Data Interpretation Visual interpretation techniques, basic elements, converging evidence, interpretation for terrain evaluation, spectral properties of soil, water and vegetation. Concepts of Digital image processing, image enhancements, qualitative & quantitative analysis and pattern recognition, classification techniques and accuracy estimation.							8	CO1		
II	Introduction to GIS: Introduction, History of GIS, GIS Components, GIS Applications in Real life, The Nature of geographic data, Maps, Types of maps, Map scale, Types of scale, Map and Globe, Co- ordinate systems, Map projections, Map transformation, Geo-referencing,							8	CO2		
III	Spatial Database Management System: Introduction: Spatial DBMS, Data storage, Database structure models, database management system, entity-relationship model, normalization Data models and data structures: Introduction, GIS Data model, vector data structure, raster data structure, attribute data, geo-database and metadata							8	CO2		
IV	Spatial Data input and Editing: Data input methods – keyboard entry, digitization, scanning, conversion of existing data, remotely sensed data, errors in data input, Data accuracy, Micro and Macro components of accuracy, sources of error in GIS. Spatial Analysis: Introduction,							8	CO3		

	topology, spatial analysis, vector data analysis, Network analysis, raster data analysis, Spatial data interpolation techniques		
V	Implementing a GIS and Applications Implementing a GIS: Awareness, developing system requirements, evaluation of alternative systems, decision making using GIS Applications of GIS: GIS based road network planning, Mineral mapping using GIS, Shortest path detection using GIS, Hazard Zonation using remote sensing and GIS, GIS for solving multi criteria problems, GIS for business applications.	8	CO4
Guest Lectures (if any)			
Total Hours		40	
Text Book-			
<ol style="list-style-type: none"> 1. Remote Sensing and GIS by Basudeb Bhatta, Oxford University Press, 2nd Edition, 2011. 2. Introduction to Geographic Information systems by Kang-tsung Chang, McGraw Hill Education (Indian Edition), 7th Edition, 2015. 3. 			
Reference Books-			
<ol style="list-style-type: none"> 1. Remote Sensing and image interpretation by Lillesand T.M. and Kiefer R.W. 2. Fundamentals of Geographic Information systems by Michael N. Demers, 4th Edition, Wiley Publishers, 2012. 			
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://archive.nptel.ac.in/courses/105/101/105101206/ https://archive.nptel.ac.in/courses/105/107/105107201/ https://archive.nptel.ac.in/courses/107/105/107105088/ https://archive.nptel.ac.in/courses/105/107/105107206/			
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	