



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

Semester/Year		VIII/IV	Program		B.Tech				
Subject Category	DE-VII (A)	Subject Code:	CE-1881	Subject Name:	Pavement Design				
Maximum Marks Allotted									
Theory		Practical			Contact Hours			Total Credits	
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work	Total Marks				
70	20	10	-	-	100			3	

Prerequisites:

Pavement construction material, type of pavement, Basic IRC code,

Course Objective:

1. This course will facilitate students to
2. To know about the data required for pavement design, factors affecting pavement design, and maintenance of pavement.
3. To understand about the different stress, strain and deflection occur in pavement system.
4. To understand the design concepts of flexible pavement rigid pavement by IRC codal provision.
5. Understand the various causes of failure in pavement and maintenance activities.
6. To know about the functional and structural evaluation of pavement by appropriate methods.

Course Outcomes:

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

1. Know the stresses, strains and deflections in rigid and flexible pavements; traffic loading; and material characterization.
2. Design methodologies for both rigid and flexible pavements.
3. Understand the structural and functions failure and the evaluation of pavements.

UNITS	Descriptions	Hrs.	CO's
I	Equivalent Single Wheel Load (ESWL) : Definition, calculation of ESWL, repetition of loads and their effects on the pavement structures.	6	CO1
II	Flexible Pavements: Component parts of the pavement structures and their functions, stresses in flexible pavements, Stress distribution through various layers, Boussinesque's theory, Burmister's two layered theory, methods of design, group index method, CBR method, Burmister's method and North Dakota cone method, IRC Method.	10	CO1
III	Rigid Pavements : Evaluation of subgrade, Modulus-K by plate bearing test and the test details, Westergaard's stress theory stresses in rigid pavements, Temperature stresses, warping stresses, frictional stresses, critical combination of stresses, critical loading positions.	8	CO2
IV	Rigid pavement design: IRC method, Fatigue analysis, PCA chart method, joints, design and construction & types,	6	CO2

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	AASHTO Method, Reliability analysis.		
V	Evaluation and Strengthening of Existing Pavement : Benkelman beam method, Serviceability Index Method. Rigid and flexible overlay and their design procedure.	10	CO3
Guest Lectures (if any)			
Total Hours		40	
Text Book-			
1. Principles of pavement design by E.J.Yoder & M.W. Witzczak			
2. AASHTO, "AASHTO Interim Guide for Design of Pavement Structures", Washington, D.C.			
3. Portland Cement Association, Guidelines for Design of Rigid Pavements, Washington			
Reference Books-			
1. DSIR, Conc. Roads Design & Construction			
2. Srinivasan M. "Modern Permanent Way"			
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/105/104/105104098/			
https://nptel.ac.in/content/storage2/courses/105101087/downloads/Lec-19.pdf			
Recommendation by Board of studies on	16.12.2022		
Approval by Academic council on			
Compiled and designed by			
Subject handled by department	Civil Engineering		



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

Semester/Year		VIII/IV	Program		B.Tech				
Subject Category	DE-VII (B)	Subject Code:	CE-1881	Subject Name:	Earth Retaining Structure				
Maximum Marks Allotted									
Theory		Practical			Total Marks	Contact Hours			Total Credits
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work		L	T	P	
70	20	10	-	-	100	3	-	-	3
Prerequisites:									
Geotechnical Engineering									
Course Objective:									
<ol style="list-style-type: none"> To understand lateral earth pressure theories and pressure theories and design of retaining walls. To design anchored bulkheads by different methods. To understand pressure envelopes and design of various components in braced cuts and cofferdams. To understand stability of earth dams and its protection and construction. 									
Course Outcomes:									
After completion of the course, the student will be able to:									
<ol style="list-style-type: none"> To understand the concept of earth retaining structure. To design retaining walls, anchored bulkheads, braced cuts, cofferdams and earth dams. 									
UNITs	Descriptions					Hrs.	CO's		
I	Lateral Pressure: Basic concepts, Rankine and Coulomb earth pressure theories, graphical methods. Determining active and passive pressures: Culmann's, Rebhan's, logarithmic spiral methods, friction circle method. Consideration of surcharge, seepage, earth quake, wave effect, stratification, type of backfill, wall friction and adhesion.					9	CO1		
	Retaining walls: Uses, types, stability and design principles of retaining walls, backfill drainage, settlement and tilting.								
II	Anchored bulkheads: Classification of anchored bulkheads, free and fixed earth support methods. Rowe's theory for free earth supports and equivalent beam methods for fixed earth supports. Design of anchored rods and dead man					9	CO1		
III	Braced cuts and Cofferdams: Braced excavations and stability of vertical cuts, lateral pressures in sand and clay, Braced and cellular cofferdams: uses, types, components, stability, piping and heaving. Stability of cellular cofferdams, cellular cofferdams in rock and in deep soils.					6	CO1		

IV	Earth dams- Stability analysis: Classification, seepage control in embankments and foundations, seepage analysis, stability analysis: upstream and down stream for steady seepage, rapid draw down, end of construction, method of slices and Bishop's method.	9	CO2
V	Earth dams -Protection & Construction: Slope protection, filters, embankment construction materials and construction, quality control, grouting techniques. Instrumentation and performance observations in earth dams.	7	CO2
Guest Lectures (if any)			
Total Hours		40	
Text Book-			
1. Foundation design by W. C. Teng, Prentice Hall, 1962			
2. Analysis and design of foundations by Bowles. J. W McGraw Hill, 4th edition, 1955.			
3. Earth and Rock-Fill Dams: General Design and Construction Considerations by United States Army Corps of Engineers, University Press of the Pacific, 2004			
Reference Books-			
1. Soil mechanics in engineering and practice by Karl Terzaghi, Ralph B. Peck, Gholamreza Mesri, 3rd Edition. Wiley India Pvt Ltd, 2010.			
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/105/106/105106052/			
https://www.youtube.com/watch?v=ucbinKVZvF8			
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 -----**CIVIL ENGINEERING**-----

Semester/Year		VIII/IV	Program		B. Tech				
Subject Category	OC-V	Subject Code:	CE-1882	Subject Name:	Construction Planning & Management				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks	L	T	P	
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work					
70	20	10	-	-	100	3	-	-	3

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	8	CO3

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	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.		
V	<p>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.</p> <p>Problem of equipment management, assignment model, transportation model and waiting line modals with their applications, shovel truck performance with waiting line method.</p>	8	CO3
Guest Lectures (if any)			
Total Hours		40	
Text Book-			
<ol style="list-style-type: none"> 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-			
<ol style="list-style-type: none"> 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/			
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 -----**CIVIL ENGINEERING**-----

Semester/Year		VIII/IV	Program		B. Tech				
Subject Category	DLC	Subject Code:	CE-1883	Subject Name:	Major Project				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks	L	T	P	
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work					
-	-	-	400	150	550	-	-	16	8

Prerequisites:

Civil Engineering

Course Objective:

Each candidate shall work on an approved Civil Engg. Project and shall submit design and a set of drawings on the project.

The project work will be a live problem in the industry or macro-issue having a bearing on performance of the civil engineering and should involve scientific research, design, collection, and analysis of data, determining solutions and must preferably bring out the individuals contribution.

Course Outcomes:

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

- Understand and analyse the real-life problems related to civil engineering.
- Provide solution of problems related to civil engineering.

Modes of Evaluation and Rubric

The project should be presented in a standard format.

The term work should be continuously evaluated as per the norms/guidelines.

Rubric:

Planning of Project Work-30%

Methodology of the work and Detailed/Design Analysis-40%

Demonstration and Presentation-20%

Real Life Application/Scope of Future Work-10%

Recommendation by Board of studies on

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