Marwadi University
Marwadi Chandarana Group

Bachelor of Technology

Civil Engineering

Design & Maintenance Skills for Pavements

01CI0518

Objective of the Course:

- To develop a fundamental understanding of the design principles and practices of highway engineering.
- To learn the procedures and methods for analyzing traffic flow, designing highway geometry, and designing pavement structures.
- To understand the role of highway engineering in ensuring the safety and efficiency of transportation networks.
- To gain knowledge of best practices in highway maintenance and rehabilitation

Credit Earned: 00

Student's learning outcomes:

After successful completion of the course, it is expected that students will be able to,

1. Apply the principles of site investigation to assess conditions that influence highway design and construction.
2. Use traffic data to understand and evaluate the traffic flow characteristics for highway planning.
3. Evaluate pavement conditions and apply maintenance strategies to ensure longevity and performance.
4. Create design solutions incorporating factors like soil type, climate, and traffic volume, aligned with IRC 37, IRC 58, and MoRTH standards.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
00	00	02	00	00	00	00	50	00	50

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	**Site Investigation**	**04**
	A thorough investigation of the site to determine the geotechnical and environmental conditions that may affect the design and construction of	

	the highway.	
2	**Traffic Analysis**	**08**
	Collection and analysis of traffic data, including traffic volume, speed, and classification, to determine the traffic flow characteristics of the site.	
3	**Pavement Design**	**12**
	Design factors such as soil type, climate, traffic volume, and expected life span of the pavement with reference to IRC 37, IRC – 58 and MoRTH specifications.	
4	**Maintenance and Rehabilitation**	**06**
	Regular inspection and maintenance of pavement as well as the timely repair or replacement of any damaged or worn components.	
	Total	**30**
5	**Field Visit**	**04**

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve an effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
5%	10%	30%	30%	15%	10%

Instructional Method and Pedagogy:

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
2. Laboratories will be taken in the dual mode: within lab as well as on the field.
3. Oral examination will be conducted at the end of the semester as a part of overall evaluation.
4. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.

Recommended Study Material

1. IRC 37: Guidelines for the Design of Flexible pavement.
2. IRC 58: Guidelines for the Design of Rigid pavement.
3. MoRTH specifications.
4. Highway Engineering by S.K. Khanna and C.E.G. Gusto, A.Veeraragavan, Nem Chand and Bros, Roorkee.
5. Traffic Engineering and Transport planning by Dr. L.R. Kadiyali, Khanna Publishers.
6. Highway Engineering by Dr. L.R. Kadiyali, Khanna Publishers.
7. IRC 106 "Guidelines for Urban Capacity for Plan Areas", IRC 1990.
8. IRC: 81-1997. Guidelines for Strengthening of flexible road pavements using Benkelman beam deflection. Technique.

9. IRC SP 16 -2019: Guidelines on measuring road roughness and norms.