Marwadi University

Master of Technology

Civil Engineering (Transportation)

01TR0404: PAVEMENT MANAGEMENT SYSTEM

Prerequisite: Pavement Design, construction and Evaluation

Objective of the Course: Objectives of introducing this subject at second year level in Masters of civil engineering are:

1. To achieve economy in transportation of good as well as passenger, efficient network is essential.
2. To improve riding quality as long as at reasonable cost.
3. To build knowledge among students about possible pavement management system aspect.

Credit Earned: 4

Students learning outcomes:

After successful completion of the course it is expected that student will be able

1. To aware of significance of pavement Management System in improving riding quality for long time at reasonable cost.
2. To learn various techniques of assessment of data management, pavement performance etc.
3. To enhance the knowledge of overlay design, optimum design and related computer application.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	CSE (M)	Internal (I)	Viva (V)	Term Work (TW)	
3	2	0	4	50	20	30	25	25	150

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	**Pavement Management & Maintenance Method:**	
	Pavement management system concept and application , Levels of pavement Management - Network & Project level, Function- Data need, life cycle of pavement, pavement performance assessment, evaluation of pavement structural capacity, distress & safety, combined measures of pavement quality , data management	10
2	**Present and Future Needs Determining:**	
	Criteria establishing- models formulation for pavement detection – future needs determination- strategies for rehabilitation and maintenance – Formulating collective programmers for maintenance & rehabilitation.	10
3	**Design At Project Level:**	

	Framework for pavement design, characterization of physical design inputs, basic structural response models –variability, reliability and risk – generating alternate design strategies, rehabilitation design procedures, Overlay design, economic evaluation of alternate pavement design strategies- selection of optimal design strategy	11
4	**Implementation:**	
	Major steps in implementing PMS- Pavement construction management & pavement maintenance management- information, research needs, cost and benefit of pavement management – future directions and need for innovations in pavement management , HDM applications.	11

Major Equipment:

1. Benkelman Beam
2. Bump Indicator

Suggested lists of experiments

1. Benkelman beam deflection study.
2. Pavement unevenness measurement by Bump Integrator.
3. Traffic volume count for EWLF.
4. O-D survey on the highway.
5. Forecasting of traffic.
6. Design for overlay.
7. Economic evaluation of pavement management.
8. Computer applications for the above problems.

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 effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	15%	10%	35%	15%	15%

Instructional Method and Pedagogy:

1. Use of Learning Management system like canvas
2. Demonstration through ppt and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

Recommended Study Material:

Reference Book:

1. Haas R. C. G., Hudson W. Ronald, Zaniewski John P., Modern Pavement Management, Krieger
2. Publishing Company, 1994 Oecd, Pavement Management Systems, O E C D 1987.
3. Shahin M. Y., Pavement management for airport, roads and parking lots, Chapman and hall 1994
4. Susan Brown, Pavement Management Systems, Transportation Research Board, 1993.
5. E.J.Yoder and M.W.Witczak, Principles of Pavement Design, John Wiley and Sons, New York, 1975 .
6. Tang, Pavement Design
7. Sharma & Shrama, Principles and Practice of Highway Engg.
8. IRC– 37, 2001, 2012, IRC – 58-1998, 2002.
9. Y.H.Huang, Pavement Analysis and Design. Prentice Hall, Englewood Cliffs, New Jersey, USA, 1993, ISBN-0-13-655275-7
10. H.N.Atkins, Highway Construction and Maintenance, Soils, and Concretes, Reston Publishing Company, Reston VA, 1983.
11. J.P.Watson, Highway Construction and Maintenance, Longman Scientific and Technical, New York, 1989.

Web Resources

Road Safety Audit NPTEL course:

https://nptel.ac.in/courses/105106115/26

https://nptel.ac.in/courses/105106115/33

https://www.pavementpreservation.org/video_library/pavement/PMS.html

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