

Branch Name:	Transportation Engineering
ProgramCode:	ET211
CourseName:	Pavement Management System
CourseCode:	2ET2110402T
Pre-requisiteCourse:	Pavement Design, Construction and Evaluation

Course Objective:

1. To exhibit, carry out and, compare between various methods of rehabilitation of pavement structures, overlay-designs etc.
2. To perform in pavement management framework in part and overall.
3. To illustrate and analyze pavement with respect to evaluation of - quality, performance and distress.

Credit	Teaching Scheme				Evaluation Scheme (Marks)								
	Hours per week				Theory (Marks)				Practical (Marks)				Total (Marks)
					SEE		CCA		SEE		CCA		
	L	T	P	Total	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
5					3	2	-	5	24	60	16	40	-

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Pavement Maintenance & Management Process: Application of system concepts to pavement management, pavement management levels-Network & Project level, functions - Data need, Pavement life cycle, assessment of pavement performance, evaluation of pavement structural capacity, distress & safety, combined measures of pavement quality, data management.	10	25%
2	Determining Present and Future Needs: Establishing criteria – development of models for pavement deterioration – determining the future needs – rehabilitation and maintenance strategies – developing combined programmes for maintenance & rehabilitation.	11	25%
3	Project Level Design: 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.	12	25%
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.	12	25%

References:

1. Kadiyali, Haas R. C. G., Hudson W. Ronald, Zaniewski John P., Modern Pavement Management, Krieger Publishing Company, 1994
2. 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.

Course Learning Outcomes:

At the end of the course, Student will be able

1. Explain the concepts of design alternatives, Rehabilitation and Maintenance.
2. Describe the process of Pavement Performance like Roughness & Structural evaluation.
3. Describe about Implementation of Pavement Management Systems.
4. Illustrate the Evaluation of Pavement Safety & Quality.

List of Practicals:

1. The 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.
9. Design of overlay on a selected stretch of highway with evaluation of the alternative designs

List of Tutorials: Problems based on syllabus

List of Open Source Software/learning website:

1. IITPAV
2. KENPAVE

Course Learning Outcomes (CLO):

After successful completion of the course the students shall be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Explain the concepts of design alternatives, Rehabilitation and Maintenance.	L-4, L-5, L-6
CLO2	Describe the process of Pavement Performance like Roughness & Structural evaluation.	L-2, L-3, L-4, L-5, L-6
CLO3	Describe about Implementation of Pavement Management Systems.	L-1, L-2, L-3
CLO4	Illustrate the Evaluation of Pavement Safety & Quality.	L-1, L-2, L-3

L1- Remember, L2- Understand, L3- Apply, L4- Analyze, L5- Evaluate, L6- Create

Mapping of CLOs with Pos & PSOs

	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
Cours e Learn ing Outco mes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	M		H	L			M		H			M	M	L	M
CLO2		M	H		M	L		M		M		M	H	M	M
CLO3	H	M		M	L		H		M			M	M	M	H
CLO4	M	H			M	L		M		L		M	H	M	M

H: High, M: Medium, L: Low