

Pavement Design and Rehabilitation

Course Code CE- 443	Credit Hours 3-0
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Course Description

This course provides the knowledge and understanding of pavement design, analysis, construction and rehabilitation. This course also provides the understanding of pavement types, traffic loadings, distresses and performance of new and reconstructed pavements.

Text Book:

1. Pavement Analysis and Design by Yong H. Huang, 2nd Ed, Pearson Prentice Hall.
2. Principles of Pavement Design Yoder, E.J, and Witzcak M.W., New York, John Wiley and Sons, 1975.

Reference Book:

1. Course Pack / Handouts by Instructor.
2. Highways: The location, design, construction and maintenance of road pavements, C.A. O'Flaherty.
3. Highway engineering by Bindra.
4. Principles of Transportation Engineering by Partha Chakroborty and Animesh Das.
5. Highway Engineering by Clarkson H. Oglesby.
6. Transportation Engineering by Paul H. Wright and Norman J. Ashford.

Prerequisites :

CE-342 Transportation Engineering-II

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%

Final Assesment/ Viva	20%
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Teaching Plan

Week No	Topics/Learning Outcomes
1	Pavement types, wheel loads, design factors, comparison of flexible and rigid pavements
2-3	Stresses in flexible pavements, layered system concept, two-layer, three-layer system
3-4	Stresses in rigid pavement
4	Measured material variability of pavement systems
5-6	Flexible pavement rehabilitation design, AASHTO, AI, PCA and FAA methods
6-7	Rigid pavement rehabilitation design, AASHTO, AI, PCA and FAA methods
8	Distresses in flexible and rigid pavements & Causes of road failures
9	MID SEMESTER EXAM
10	Distress surveys and pavement performance evaluation including application of artificial intelligence (AI) Introduction & Use of Artificial Intelligence in measuring pavement distresses and maintenance strategies. (Machine learning, Automatic image processing for distresses etc)
11	Pavement Functional Evaluation
12	Pavement Structural Evaluation, Maintenance and Rehabilitation Treatment Alternatives
13	Pavement Performance Modelling
14	Flexible and Rigid Pavement Rehabilitation Techniques
15	Selection of Preferred Rehabilitation Alternatives
16	Pavement Cost and Effectiveness Analysis
17-18	End Semester Exam

Practical: Nil.