

CE 554 Sustainable Transportation Assets Management

Credit and Contact hours	3 / 3 (Lectures), 0 (Tutorials), 0 (Laboratory)												
Required, or Elective	Elective												
Course Description	Composites: Overview of the multimodal transportation system, data collection processing, and management, transportation performance modeling, transportation needs assessment economic analysis of investment strategies for highway pavement and traffic control and safety, transportation environmental impact analysis, project selection, programming, and trade-off analysis methods.												
Prerequisites or Co-requisites	None												
Course Learning Outcomes	<p>Students completing this course successfully will be able to:</p> <table> <thead> <tr> <th>Course Learning Outcomes (CLOs)</th><th>Related Student Outcomes (SO)</th></tr> </thead> <tbody> <tr> <td>CLO1. Course Description and Introduction of Composites. K1</td><td>SO1</td></tr> <tr> <td>CLO2. Overview of a multimodal transportation system. S1</td><td>SO2</td></tr> <tr> <td>CLO3. Transportation asset management, Transportation goals, objectives, and performance measures, Data needs, collection, processing, and database management. S2</td><td>SO3</td></tr> <tr> <td>CLO4. Data collection, processing, and database management, Dimensions of data needs for transportation asset management, Data needs for pavement management. S2</td><td>SO3</td></tr> <tr> <td>CLO5. Transportation facility performance modeling, General, Characteristics of facility performance measures and models, Facility condition deterioration, and service life expectancy. S2</td><td>SO3</td></tr> </tbody> </table>	Course Learning Outcomes (CLOs)	Related Student Outcomes (SO)	CLO1. Course Description and Introduction of Composites. K1	SO1	CLO2. Overview of a multimodal transportation system. S1	SO2	CLO3. Transportation asset management, Transportation goals, objectives, and performance measures, Data needs, collection, processing, and database management. S2	SO3	CLO4. Data collection, processing, and database management, Dimensions of data needs for transportation asset management, Data needs for pavement management. S2	SO3	CLO5. Transportation facility performance modeling, General, Characteristics of facility performance measures and models, Facility condition deterioration, and service life expectancy. S2	SO3
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Student Outcomes related to this Course	<p>SO 1 Recognize advanced engineering knowledge, concepts, and techniques to identify, interpret, and analyze complex and real-life engineering problems.</p> <p>SO 2 Provide solutions for complex and real-life engineering problems through critical thinking and the use of modern engineering tools, and identify their impact on social, global, cultural, environmental, safety, and economic factors.</p> <p>SO 3 Investigate scientific research problems independently or through teamwork using critical thinking, appropriate techniques, advanced tools, and management principles.</p>												
Topics Covered	<table> <thead> <tr> <th>List of Topics</th><th>Related CLOs</th></tr> </thead> <tbody> <tr> <td>1. Course Description and Introduction of Composites</td><td>CLO 1</td></tr> <tr> <td>2. Transportation asset management, Transportation goals, objectives, and performance measures, Data needs, collection, processing, and database management.</td><td>CLO 1</td></tr> </tbody> </table>	List of Topics	Related CLOs	1. Course Description and Introduction of Composites	CLO 1	2. Transportation asset management, Transportation goals, objectives, and performance measures, Data needs, collection, processing, and database management.	CLO 1						
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	3. Data collection, processing, and database management, Dimensions of data needs for transportation asset management, Data needs for pavement management	CLO 2
	4. Transportation facility performance modeling, General, Characteristics of facility performance measures and models, Facility condition deterioration, and service life expectancy.	CLO 2
	5. Transportation agency cost modeling and highway agency cost estimation methods.	CLO 3
	6. Transportation needs assessment Physical transportation facility needs assessment Threshold condition levels for pavement treatments	CLO 4
	7. Economic analysis of transportation modes preservation	CLO 5
Textbook(s) and Other Required Material	<ul style="list-style-type: none"> Roberts, J, Road infrastructure management systems (rims): the <i>main</i> components, 2004, ARRB Saudi Highway Code. 	
Grading System	Assignments 10% Lecture attendance ---- Team project 5% Case/ Field Study 5% Overview (literature review) paper 5% Project - report and oral presentation 10% Mid-term exam 25% Final Exam 40%	
Instructors	Prof. Abdullah Al-Mansour	
Date of Review	April, 2025	