

College of Engineering

Department of Civil Engineering



CE 435 Railway Engineering

Credit and Contact hours	3 / 3 (Lectures), 1 (Tutorials), 0 (Laboratory)	
Required, or Elective	Elective for a BSCE degree	
Course Description	Introduction to railway transport systems, railway terminologies, Railways in Saudi Arabia, dynamic aspects of train motion (train speed, power, and acceleration requirements), track components, vertical and horizontal alignments, railway yards, stations and platforms, and railway traffic control and signaling.	
Prerequisites or Co-requisites	CE 431 (Highway Engineering)	
Course Learning Outcomes	Students completing this course successfully will be able to	
	Course Learning Outcomes	<i>Related Student Outcomes (SO)</i>
	CLO1. Determine the effects of rail transport system components and various elements including signaling and communication systems.	SO1
	CLO2. Analyze the aspects of dynamics of train motion through horizontal and vertical alignments.	SO1
	CLO3. Conduct the geometric design of superstructure and substructure of the railway track.	SO2
CLO4. Analyze the essentials of railway management, operation and economy.	SO1	
Student Outcomes related to this Course	<p>SO 1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics, and using modern engineering tools .[ABET 1]</p> <p>SO 2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. [ABET 2]</p>	
Topics Covered	List of Topics	Related CLOs
	1. Introduction to Railway Engineering	CLO1
	2. Locomotive and cars	CLO1
	3. Tractive Effort and Train Resistance	CLO2

	4. Track alignment and geometry	CLO3
	5. Dynamic Loads	CLO2
	6. Beam on Elastic Foundation	CLO3
	7. Railroad Geotechnical	CLO3
	8. Rail and Sleepers Defects	CLO1
	9. Maintenance of railway tracks	CLO4
	10. Accidents and Derailments Causes and investigation	CLO4
	11. Drainage	CLO3
	12. Railway Yards and Terminals	CLO1
Textbook(s) and Other Required Material	<p>2. Railway Engineering (2nd edition), Chandra S. and M.M. Agarwal, Oxford University Press (2013)</p> <p>3. A Textbook of Railway Engineering, S.C. Saxena and S.P. Arora, Dhanpat Rai Publishing Co Pvt Ltd (2006)</p>	
Grading System	<p>Tutorials and Assignments 15%</p> <p>Term Project 15%</p> <p>Mid-term exams 30%</p> <p>Final Exam 40%</p>	
Instructors	Dr. Seongkwan Mark Lee (Room 2A55), email; slee@ksu.edu.sa	
Date of Review	September 2020	