هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	Railway Engineering
Course Code:	CE 4307
Program:	Bachelor of Science in Civil Engineering
Department:	Civil Engineering Department
College:	College of Engineering and Architecture
Institution:	Umm Al Qura University
Version:	1
Last Revision Date:	31 January 2025

Table of Contents

A. General information about the course: 3

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods 4

C. Course Content 5

D. Students Assessment Activities 6

E. Learning Resources and Facilities 6

F. Assessment of Course Quality 7

G. Specification Approval 8

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	Others
B.	☐ Required		☒ Elective		
3. Level/year at which this course is offered: Level 9th , 10th / Year 5th					
4. Course General Description:					
In this course, student will acquire, fundamental principles for railway engineering, basic track geometry parameters, railway superstructure and substructure components, operation and maintenance aspects of railway system, railway electrotechnical installations, environmental and societal impact of railway infrastructure.					
5. Pre-requirements for this course (if any)**:**					
CE 2202 CE 4303					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
To enable civil engineering students acquire necessary knowledge related to railway engineering.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		

No	Mode of Instruction	Contact Hours	Percentage
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Ability to describe the process of how decisions to build railway	K3	Through lectures, module notes, tutorials, coursework and examinations. • Through group project work requiring detailed consideration of a multi-disciplinary approach • Through detailed research and analysis of a particular topic for their Individual Project requiring a multi-disciplinary approach	• Assessed out-of-class and in-class course works. Course works may be in the form of: laboratory and fieldwork reports, essays, in-class tests, design calculations, and literature reviews • Written examinations • Project report(s), oral examination and writing of a journal-style paper
1.2	To learn about planning, analysis and designing in the field of Transportation engineering.	K3		
2.0	**Skills**			
2.1	Discuss various Types of Track Turnouts	S2	• Through lectures, module notes, tutorials, coursework and examinations. • Through group project work that will require detailed consideration of a	• Assessed out-of-class and in-class course works. Course works may be in the form of: fieldwork reports, essays, in-class tests, design calculations, and literature reviews
2.2	Design on available documents & drawings	S3		

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			multi-disciplinary approach • Through detailed research and analysis of a particular topic in the compulsory Individual Project module requiring a multi-disciplinary approach	• Written examinations Project report(s), oral examination and writing of a journal-style paper
3.0	**Values, autonomy, and responsibility**			
3.1	To increase the ability to understand problems and issues related to railway Engineering	V1	• Through lectures, tutorials, coursework and group project work. • Through supervised laboratory exercises following standard procedures • Through supervised outdoor practical work • Through supervised computer-based laboratory exercises	• Assessed out of class and in-class coursework. (fieldwork reports, modelling calculations) • Project reports and peer review of individual contributions to group work • Observation by tutors during laboratory and fieldwork activities
3.2	To prepare our students for immediate employment in any primary branch of civil engineering.	V3		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Railway Transport Systems	3
2	Railway Terminologies	3
3	Railways in Saudi Arabia	3
4	Railway Track Design	3
5	Railway Track Maintenance	3
6	Dynamic Aspects of Train Motion (Train Speed, Power, and Acceleration Requirements)	3
7	Track Components	3
8	Sustainable Railway Systems	6
9	Railway Operations and Scheduling	3
10	Railway Safety and Risk Management	3
11	Railway Stations and Yards	3
12	Railway Traffic Control and Signaling.	3

13	Management, Maintenance and Upgradation of Railway Track	3
14	Rapid Railroad Systems	3
	Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework Assignment	Bi-weekly	5 %
2.	Quizzes	Bi-weekly	5 %
3.	Term Project	Week 3-14	10%
4.	Midterm Exam	9	30 %
5.	Final Exam	16 / 17	50 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	• Satish, C., & Agarwal, M. M. (2013). Railway engineering. Oxford University Press.
Supportive References	• F.L. Mannering, S.S. Washburn and W.P. Kilareski, "Principles of Highway Engineering and Traffic Analysis" 4th Edition, John Wiley & Sons, Washington D.C, 2009. • C. Jotin, Khisty, B. Kent Lall, “Transportation Engineering”, 3rd Edition, Prentice Hall, Englewood Cliffs, New Jersey 07458, 2003.
Electronic Materials	• http://www.sciencedirect.com. • http://www.trb.org/Main/Home.aspx
Other Learning Materials	• standards or regulations and software.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom for about 40 students, with white board, computer, projector and internet
Technology equipment (projector, smart board, software)	Computing Services provides the University IT facilities and infrastructure. General purpose computer resources across campus are open 24 hours and more specialist computer laboratories are provided in partnership with departments. Students in halls of residence are supported in connecting their computers to the high speed network. The

Items	Resources
	University's virtual learning environment "LEARN" provides on and off campus access to web-based teaching materials provided by lecturing staff.
Other equipment (depending on the nature of the specialty)	A white board & Computer with internet and data show. Computing Services provides the University IT facilities and infrastructure. General purpose computer resources across campus are open 24 hours and more specialist computer laboratories are provided in partnership with departments. Students in halls of residence are supported in connecting

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	• Faculty members who teach this course	• Student questionnaire at the end of the semester. • Student test result analysis. • Regular feedback from students.
Effectiveness of Students assessment	Faculty members who teach this course and those teaching other courses relevant to this course.	• Regular review of the course contents by the related department committee. Input from visiting professors.
Quality of learning resources	• Faculty members who teach this course	• Regular updating of learning resources. • Usage of new technologies in presenting the course materials. • Self-learning. • Promote reading of outside materials. • Encouraging students to conduct scientific presentations and group discussions. • Additional training for the staff assistants.
The extent to which CLOs have been achieved	• Independent member(s) teaching staff	• Check marking by an independent member teaching staff of a sample of student work, periodic

Assessment Areas/Issues	Assessor	Assessment Methods
		exchange and remarking of tests or a sample of assignments with staff at another institution • A review of a sample of student answers by a related department committee. • In-department group review and marking. • External reviewer for a sample of student answering sheets.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	CIVIL ENGINEERING COUNCIL
REFERENCE NO.	THE FIFTEENTH SESSION OF THE ACADEMIC YEAR 1446
DATE	30 APRIL 2025

Course Coordinator



Dr. Mohannad Alyamani