Course Specification
(Bachelor)

Course Title:	Introduction to Transportation Engineering
Course Code:	CE 3301
Program:	Bachelor of Science in Civil Engineering
Department:	Civil Engineering Department
College:	College of Engineering & 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.....6

D. Students Assessment Activities.....6

E. Learning Resources and Facilities.....7

F. Assessment of Course Quality.....8

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 7 / 4th Year)					
4. Course General Description:					
This course provides a comprehensive overview of transportation engineering, covering multimodal transportation systems, design and function of highways, railways, air, and water transportation. The course also examines driver, vehicle, and road characteristics, traffic stream behavior, and control devices. Essential topics such as capacity analysis, level of service, and intersection design will be discussed. Additionally, transportation planning, public transit fundamentals, highway materials, and pavement. The course concludes with an assessment of the environmental and societal impacts of transportation projects.					
5. Pre-requirements for this course (if any)**:**					
Topographic and photogrammetric survey Engineering Statistics and Probability					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
• To acquire knowledge of fundamentals aspects of various modes of transportation and ability to compare the effectiveness of various modes. • To get knowledge of planning process and various components of traffic system, i.e. road users, vehicular traffic, roadway geometrics and traffic stream characteristics. • To gain basic knowledge of traffic related studies, control devices, capacity and level of service for freeways and multilane highway. • To be able to design requirements for roads and highways. • To utilize safety requirements, traffic analyses and vehicle abilities in the design of roads.					

2. Teaching mode (mark all that apply)

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

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid • Traditional classroom • E-learning		
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	To demonstrate the fundamentals aspects of various modes of transportation and ability to compare the effectiveness of various modes.	K.1	• Through lectures, module notes, tutorials, coursework and examinations. • Through individual / group project work requiring detailed consideration of a multi-disciplinary approach • Through detailed research / analysis of a particular topic for their	•Class tests and quizzes. • Oral and written examinations • Homework • Technical reports
1.2	To demonstrate the planning process and various components of traffic system, i.e., road users, vehicular traffic, roadway geometrics and traffic stream characteristics	K.1		

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.3	To outline the basic knowledge of transportation planning process and related studies, traffic control devices, capacity, and level of service for freeways and multilane highway	K.1	Individual Project requiring a multidisciplinary approach	
2.0	**Skills**			
2.1	To assess the ability of applying fundamental aspects of various modes of transportation and their comparison.	S.1	•Through lectures, module notes, tutorials, coursework and examinations. • Through group project work that will require detailed consideration of a multi-disciplinary approach • Through detailed research and analysis of a particular topic in the compulsory Individual Project module requiring a multidisciplinary approach	• Class tests and quizzes. • Oral and written examinations • Homework • Technical reports • Evaluating individual and group tasks • Laboratory or practical • examinations • Presentation • Computer applications
2.2	To integrate transportation planning and design various components using both basic principles and modern engineering tools.	S.2		
2.3	To evaluate the ability to apply knowledge of transportation planning process and carry out transportation studies	S.3		
2.4	To evaluate relevant analysis and to derive the solutions for transportation planning process.	S.4		
3.0	**Values, autonomy, and responsibility**			
3.1	Integrate professionally and ethically with multidisciplinary teams in	V.1	• Through lectures, tutorials and coursework. • Group project	• Written and oral exams. • Practical exams. • E-learning

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	transportation engineering projects, operations and services.			
3.2	Evaluate complex transportation engineering problems using AASHTO codes and practices demonstrating ability of life-long learning.	V.2	work. • Through supervised outdoor practical work • Through supervised computer-based laboratory	assignments • Project assessment. • Presentation • Technical reports • Homework
3.3	Develop expertise required for real-life projects serving society and providing solutions for traffic specially during Hajj and Umrah.	V.3		

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to the Course	2
2.	Background to Multimodal Transportation and Transportation Systems	3
3.	Basic Components of Highways	3
4.	Basic Components of Railways	3
5.	Basic Components of Air Transportation and Water Transportation	3
6.	Driver, Vehicle and Road Characteristics	3
7.	Traffic Control Devices System	3
8.	Traffic Stream Characteristics	3
9.	Capacity and Level of Service Analysis	4
10.	Intersection and Interchanges	3
11.	Transportation Planning: Basic Elements	3
12.	Public Transportation: Basic Elements	3
13.	Fundamentals of highway materials and pavement design	3
14.	Impacts of Transportation Projects	3
15.	Review	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	15 %
2.	Quizzes	Bi-weekly	10 %
3.	Midterm Exam	6 or 7	25 %
...	Final Exam	16	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	N.J. Garber and L.A. Hoel, "Traffic and Highway Engineering" 5th Edition, Stamford, Connecticut : Cengage Learning, [2015] ISBN-13: 9781133605157
Supportive References	• Khisty, C. J., and Kent L. B., "Transportation Engineering: An Introduction", 3rd Edition, Pearson, 2002. • P.H. Wright, N. J. Ashford, R. J. Stammer, Jr., "Transportation Engineering Planning and Design", 4th Edition, John Wiley & Sons, Inc., 1998. ISBN-10: 0471173967, ISBN-13: 978-0471173960
Electronic Materials	• http://www.sciencedirect.com. • http://www.trb.org/Main/Home.aspx • http://www.ite.org • https://bookstore.transportation.org/
Other Learning Materials	• Highway Design Manual, Ministry of Transport, KSA. • AASHTO American Association of State Highway and Transportation Officials • Manual on Uniform Traffic Control Devices, 2009 Edition

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

Items	Resources
	laboratories are provided in partnership with departments. Students in halls of residence are supported in connecting their computers to the high speed network. The 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)	Well-equipped computer lab, asphalt lab and libraries are available for students for addition resource.

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	Independent member(s) teaching staff	• Check marking by an independent member teaching staff of a sample of student work, periodic 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.
Quality of learning resources		
The extent to which CLOs have been achieved		
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

