



## Course Specifications

<b>Course Title:</b>	Transportation Engineering
<b>Course Code:</b>	CE 318
<b>Program:</b>	B.Sc. in Civil Engineering
<b>Department:</b>	Civil Engineering
<b>College:</b>	Jubail University College
<b>Institution:</b>	Jubail University College

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## A. Course Identification

<b>1. Credit hours:</b>	4
<b>2. Course type</b>	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b>	Level 5, Third Year
<b>4. Pre-requisites for this course (if any):</b>	CE 206 Surveying, ME 301 Dynamics
<b>5. Co-requisites for this course (if any):</b>	None

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	✓	100
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
<b>Contact Hours</b>		
1	Lecture	45
2	Laboratory/Studio	45
3	Tutorial	
4	Others (specify)	
	<b>Total</b>	<b>90</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description

*CE 318 Transportation Engineering (3-3-4)*

*Prerequisite: CE 206 & ME 301*

Introduction to transportation engineering; planning and evaluation of transportation systems; characteristics of transportation systems, drivers, vehicles, roads, pedestrian and bicycles; traffic engineering studies; introduction to design principles of highway facilities; introduction to intelligent transportation systems; Field studies related to traffic engineering and geometric design of highways; transportation in Saudi Arabia; application of computer software(s) related to transportation.

### 2. Course Main Objective

The purpose of this course is to enable the students to get theoretical and practical knowledge of planning, evaluation and design of transportation systems.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding</b>	
1.1	Define characteristics of transportation systems.	8
1.2	Mention the transportation systems in Saudi Arabia	8
1.3	Describe traffic engineering studies.	8
1.4	Identify the design principles of facilities at highways.	8
<b>2</b>	<b>Skills</b>	
2.1	Analyze the data needed for traffic engineering studies	1
2.2	Apply field experiments to evaluate the basic traffic studies and pavement materials.	6
2.3	Design the highway facilities (Geometric)	2
2.4	Evaluate the transportation systems and its alternatives.	1
2.5	Use computer software related to transportation	1
<b>3</b>	<b>Values</b>	
	N/A	

### C. Course Content

No	List of Topics	Contact Hours
1	<b>Unit 1: Introduction to transportation engineering</b> 1.1 General definitions 1.2 Importance of transportation 1.3 Major disciplines of transportation engineering Transportation infrastructure engineering	6
2	<b>Unit 2: Planning and evaluation of transportation systems</b> 2.1 Urban transportation planning 2.2 Basic elements of transportation planning process 2.3 Travel demand forecasting process 2.4 Principle models used in transportation planning 2.5 Selecting and measuring evaluation criteria 2.6 Evaluating transportation alternatives	12
3	<b>Unit 3: Characteristics of transportation systems, drivers, vehicles, roads, pedestrian, and bicycles</b> 3.1 Modes of transportation 3.2 Public transportation systems 3.3 Driver characteristics 3.4 Vehicles characteristics 3.5 Road characteristics 3.6 Pedestrian characteristics 3.7 Bicycles characteristics	18
4	<b>Unit 4: Traffic engineering studies</b> 4.1 Traffic volume and speed studies 4.2 Traffic flow relationships 4.3 Capacity and level of service	18

	4.4 Travel time and delay studies Traffic control devices	
5	<b>Unit 5: Introduction to design principles of highway facilities</b> 5.1 Highway surveys and location 5.2 Geometric design of highway facilities 5.3 Factors influencing highway design 5.4 Highway Functional Classification 5.5 Access Control and Access Management 5.6 Cross Section of Highway 5.7 Design of Vertical and Horizontal curves	18
6	<b>Unit 6: Introduction to Intelligent transportation systems ( ITS )</b> 6.1 Introduction and its components 6.2 Importance of ITS 6.3 Typical Applications in road, rail and water transport	6
7	<b>Unit 7: Transportation in Saudi Arabia</b> 7.1 Introduction 7.2 Types of transportation systems 7.3 Present condition of transportations	6
8	<b>Unit 8: Application of computer software's related to transportation engineering</b> 8.1 Introduction to transportation software's	6
<b>Total</b>		90

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
1.1	Define characteristics of transportation systems.	Interactive learning Self-directed learning	Quiz 1, assignment 1 & midterm
1.2	Mention the transportation systems in Saudi Arabia		Quiz 1, assignment 1 & midterm
1.3	Describe traffic engineering studies.		Quiz 2, assignment 2 & final exam
1.4	Identify the design principles of facilities at highways.		Quiz 2, assignment 2 & final exam
<b>2.0</b>	<b>Skills</b>		
2.1	Analyze the data needed for traffic engineering studies	Interactive learning Self-directed learning	Quiz 2, assignment 2 & final exam
2.2	Apply field experiments to evaluate the basic traffic studies and pavement materials.		Lab midterm & final exam, lab report and lab performance
2.3	Design the highway facilities (Geometric)		Quiz 2, assignment 2 & final exam
2.4	Evaluate the transportation systems and its alternatives.		Quiz 1, assignment 1 & midterm

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.5	Use computer software related to transportation		assignment 2
3.0	<b>Values</b>		
	N/A		

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	4	5%
2	Assignment 1	6	5%
3	Mid-Term LT	8	20%
4	Mid-Term LB	9	5%
5	Quiz 2	12	5%
6	Assignment 2	14	5%
7	Final Exam -LB	16	10%
8	Performance LB	16	10%
9	Lab Record	16	5%
10	Final Exam-LT	17-19	30%

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :**

- Office hours 16 hr/week; students can go in times of office hours for teacher to explain what could not be understood from the lesson.
- Students can communicate with a staff member outside the official working hours by email.
- Students are also encouraged to visit their academic advisors.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<a href="#">Garber, N. J.</a> and <a href="#">Hoel, L. A.</a> (2010). Traffic and Highway Engineering, USA: Cengage Learning
<b>Essential References Materials</b>	<a href="#">Myer, K.</a> (2003). Handbook of Transportation Engineering, USA: McGraw-Hill <a href="#">Fricker, J.D</a> and <a href="#">Whitford, R.K</a> (2004). Fundamentals of Transportation Engineering, USA: Prentice Hall
<b>Electronic Materials</b>	None
<b>Other Learning Materials</b>	None

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Lecture rooms with a capacity of at least 25 students and fitted with multimedia projector and a computer.
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Technology software related to Transportation Engineering
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment as per QMS-Policy-006 Feedback Survey, QMS-QAP-116 Monitoring Students' Satisfaction	Students	Indirect: Analyzing the results of the following surveys Course Evaluation Survey(CES), Program Evaluation Survey (PES), Student Experience Survey (SES)
Quality of Exam papers and Verifying Standards of Student Achievement as per QMS-Policy-004 Policy for Examinations and Marking, QMS-ACP-102 Procedure for Marking Examinations	Examination Committee	Direct: Peer review of examination papers and review or double check a minimum of three or 10% of answer papers. Verifying the entries in the Activity Mark Sheet.
Achievement of learning outcomes as per QMS-Policy-001 Course Review, QMS-CDP-106, QMS-CDP-112 Curriculum Review	Faculty	Direct: Course Report (Section B-3)
Implementation of the action plans based on previous semester as per QMS-Policy-001 Course Review, QMS-CDP-106 Procedure for Course Review, QMS-CDP-112 Procedure for Curriculum Review	Faculty	Direct and Indirect: Course report (Section G-1, G-2)
Monitoring Teaching and Learning as per QMS-Policy-005 Monitoring of Teaching and Learning	Chairperson/Program Director/Course Director	Indirect: Feedback by Chairperson/Program director/Course director. Program Delivery Record.
Effectiveness of planned Teaching Strategies QMS-Policy-001 Course Review	Faculty	Indirect: Course Report (Section B-4)

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course effectiveness and planning for improvement as per QMS-Policy-001 Course Review, QMS-CDP-106 Procedure for Course Review, QMS- CDP-112 Procedure for Curriculum Review	Faculty	Direct and Indirect: Course report (Section G-3)
Verifying Standards of Student Achievement and Quality of Exam papers as per QMS-ACP-119 External Assessment Review	Assessment External Reviewer	Direct: Report of assessment external reviewer. Review of sample of ten or 10% of student's assessments and coursework scripts.

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	Civil Engineering Department Council
<b>Reference No.</b>	REG MIN-CED-10
<b>Date</b>	27-04-2020

## Appendix A Revision Details

Revision no.	DESCRIPTION	Reference MoMs			
		DC		CDC	
		Sem	#	Sem	#
1	Revision of Course Teaching Strategies and action verbs based on the comments of NCAAA reviewer	392	4	392	4
2	Course Specification Template 2018	402			