



44Course Specification of Traffic Engineering

I. Course Identification and General Information:					
1	Course Title:	Traffic Engineering			
2	Course Code & Number:	CE303			
3	Credit hours:	C.H			
		Th.	Tu.	Pr.	Tr.
		2	2		
4	Study level/ semester at which this course is offered:	4th Level/ 1st semester			
5	Pre –requisite (if any):	Statistics, Computer Skills			
6	Co –requisite (if any):	-----			
8	Program (s) in which the course is offered:	Civil Engineering			
9	Language of teaching the course:	English+ Arabic			
10	Location of teaching the course:	Class room			
11	Prepared By:	Dr. Abdlsalam M Althawr			
12	Date of Approval				

II. Course Description:
<p>This course is designed to provide students with knowledge about the traffic Engineering including basics, surveys, techniques, tools, design and studies aspects. It is intended to introduce students to traffic flow principles, traffic surveys, intersections and parking design and control and traffic impacts on environment and society.</p>

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



III. Course Intended learning outcomes (CILOs) of the course		Referenced PILOs
a1	Define the basics of traffic flow principles: traffic volume, capacity and speed	A1
a2	Define how to select the appropriate standards and codes	A2
a3	Define the principles of intersection and roads traffic control techniques and relevant IT modeling software	A3
b1	Demonstrate in solving present situation and predicted situation	B1
b2	Apply appropriate models to predict the future situation	B2
b3	Demonstrate proficiency in the evaluation and integration of information and processes in the data collection surveys	B3
c1	Design the planning framework (objectives, problems, alternatives to solve the problem)	C2
c2	Use techniques, tools and software to gather data	C3
d1	Present the traffic flow data and relationships	D1
d2	Implement team work with good management	D2
d3	Work in a team or individually to assess the traffic situation on a road or an intersection	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Define the basics of traffic flow principles: traffic volume, capacity and speed	-Lectures, Multimedia - Demonstration & Discussions	-Mid Term and Final Exam. - assignment
a2- Define how to select the appropriate standards and codes.		
a3- Define the principles of intersection and roads traffic control techniques and relevant IT modeling software		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Demonstrate in solving present situation and predicted situation b2- Apply appropriate models to predict the future situation b3- Demonstrate proficiency in the evaluation and integration of information and processes in the data collection surveys	-Lectures, Multimedia . - model demonstration -Project method/cases study	- Assignment. - presentation. -Project -Mid Term and Final Exam

C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c.1- Design the planning framework (objectives, problems, alternatives to solve the problem) c2- Use techniques, tools and software to gather data	-Lectures, Multimedia -Model demonstration - Cases study	-Assignment -Report -Presentation . -Mid Term and Final Exam

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Present the traffic flow data and relationships d2- Implement team work with good management d3- Work in a team or individually to assess the traffic situation on a road or an intersection	cases study	Report

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to basics of definition of traffic engineering aspects,	a2,a3 b3,	urban congestion problem, role of traffic engineer, references, what, why, how?	1	2
2	Traffic surveys design	a2, b2,b3, c1, c2, d1,d2,d3	Time, duration, techniques and tools, location, data collection, processing and analysis process, , sectors, zone and subzone study area boundary	2	4
3	Traffic flow studies: macroscopic and microscopic studies	a1,a3 b1,b2,b3, c1,	Traffic flow, traffic density, traffic speed, time and distance headway, present situation assessment and future situation prediction	3	6
4	Intersections design	a1,a2,a3 b1,b2,c1, c2	Conflict points, priority role, signal design, coordination method, roundabouts	1	2
5	Intersections design	a1,a2,a3 b1,b2,c1, c2	Conflict points, priority role, signal design, coordination method, roundabouts	2	4
6	Traffic management techniques	a2, b3,	Signs, marking, 3Es', MUTCD2012	1	2
7	Parking design and operation Bicycles and pedestrian facilities design	a1,a2,b1, b3,c1, c2,	On-street parking, area parking, city parking	1	2

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



8	Traffic impacts on society and environment	a2,b3, c1,	Traffic safety, , crashes, causes and results	1	2
9	Latest technology, software	a3,,b2, c2,	Arcady /Picady /Oscady, vissum, cers, ITS,	2	4
Number of Weeks /and Units Per Semester				14	28

B - Tutorial Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Introduction to basics of definition of traffic engineering aspects,	1	2	a2,a3 b3,
2	Traffic surveys design	2	4	a2, b2,b3, c1, c2, d1,d2,d3
3	Traffic flow studies: macroscopic and microscopic studies	3	6	a1,a3 b1,b2,b3, c1,
4	Intersections design	3	6	a1,a2,a3 b1,b2,c1, c2
5	Traffic management techniques	1	2	a2, b3,
6	Parking design and operation Bicycles and pedestrian facilities design	1	2	a1,a2,b1, b3,c1, c2,
7	Traffic impacts on society and environment	1	2	a2,b3, c1,
8	Latest technology, software	2	4	a3,,b2, c2,
Number of Weeks /and Units Per Semester		14	28	

V. Teaching strategies of the course:

Lecture
Multimedia Presentations
Discussion
Demonstration
model demonstration
-Project method/cases study

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



VI. Assignments:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Traffic Survey design	a2, b2,b3, c1, c2, d1,d2,d3	3	3
2	Present situation evaluation	a1,a3 b1,b2,b3, c1,		
3	Future situation prediction	a1,a3 b1,b2,b3, c1,		
4	Traffic studies: Mac. and Mic.	a1,a3 b1,b2,b3, c1,		
5	Intersection designs	a1,a2,a3 b1,b2,c1, c2	6,9	4
6	Traffic management	a2, b3, c1,		
7	Parking design	a1,a2,b1, b3,c1, c2 ,d1		
8	Impacts assessments	a2,b3, c1,	12	3
9	Project/ study cases	b2, c2,d1,d2,d3,		

VII. Schedule of Assessment Tasks for Students During the Semester:					
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments /quizzes	3,6,9,12	10	10%	a1, b1,b2, b3, c1,c2 a2,d1,d2,d3
2	Mid Term	7	10	10%	a1,b1,b2,c2,c4
3	Group project	13	10	10%	a1, b1,b2, c2,c4
4	Final Exam	Schedules	70	70%	a1,b1,b2,c2,c4
	Total		100	100%	

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



VIII. Learning Resources:

- Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

	1- تخطيط النقل داخل المدن، د علي عبد المنعم حسن، 1994، بيروت: دار الراتب الجامعية
	2- هندسة النقل والمرور د محمود توفيق سالم، 1983، دار الراتب الجامعي

2- Essential References.

	1- Traffic Analysis and design, R J Salter, 2003
	Traffic Engineering Manual, 20042
	3- MUTCD Manual, 2012

3- Electronic Materials and Web Sites etc.

	1- AASHTO softwares
	2- TRL softwares
	3- Vissum /picady /arcady /oscady /cers
	4- Trnsit14

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



IX. Course Policies:	
1	Class Attendance: The students should have more than 75 % of attendance according to rules and regulations of the faculty.
2	Tardy: The students should respect the timing of attending the lectures. They should attend within 1 minutes from starting of the lecture.
3	Exam Attendance/Punctuality: The student should attend the exam on time. The punctuality should be implemented according to rules and regulations of the faculty for midterm exam and final exam.
4	Assignments & Projects: The assignment is given to the students after each chapter, the student has to submit all the assignments for checking on time.
5	Cheating: If any cheating occurred during the examination, the student is not allowed to continue and he/she has to face the examination committee for enquiries .
6	Plagiarism: The student will be terminated from the Faculty, if one student attends the exam on another behalf according to the policy, rules and regulations of the university.
7	Other policies: -All the teaching materials should be kept out the examination hall. -The mobile phone is not allowed. -There should be a respect between the student and his teacher.

Reviewed By	<u>Vice Dean for Academic Affairs and Post Graduate Studies</u> <u>Dr. Tarek A. Barakat</u> <u>Dr. Mohammad Algorafi</u>
	<u>Deputy Rector for Academic Affairs Dr. Ibrahim AlMutaa</u> <u>Dr. Ahmed mujahed</u> <u>Dr. Munaser Alsubri</u>

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



Course Plan (Syllabus) of Traffic Engineering

I. Information about Faculty Member Responsible for the Course:						
Name of Faculty Member	Dr. AbdIslam Althawr	Office Hours				
Location & Telephone No.		SAT	SUN	MON	TUE	WED THU
E-mail			8-2		8-2	

II. Course Identification and General Information:					
1-	Course Title:	Traffic Engineering			
2-	Course Number & Code:	CE303			
3-	Credit hours:	C.H			
		Th.	Tu.	Pr.	Tr.
		2	2		
4-	Study level/year at which this course is offered:	4th Level/ 1st semester			
5-	Pre –requisite (if any):	Statistics, Computer Skills			
6-	Co –requisite (if any):	-----			
7-	Program (s) in which the course is offered	Civil Engineering			
8-	Language of teaching the course:	English+ Arabic			
9-	System of Study:	Regular			
10-	Mode of delivery:	Lecture			
11-	Location of teaching the course:	Class			

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



III. Course Description:

- This course is designed to provide students with knowledge about the traffic Engineering including basics, surveys, techniques, tools, design and studies aspects. **It is intended to introduce students to traffic flow principles, traffic surveys, intersections and parking design and control and traffic impacts on environment and society.**

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill, the course is intended to develop the student's skills to:

- a.1 Define the basics of traffic flow principles: traffic volume, capacity and speed A1
- a.2 Define how to select the appropriate standards and codes A2
- a.3 Define the principles of intersection and roads traffic control techniques and relevant IT modeling software A3
- b.1 Demonstrate in solving present situation and predicted situation B1
- b.2 Apply appropriate models to predict the future situation B2
- b.3 Demonstrate proficiency in the evaluation and integration of information and processes in the data collection surveys B3
- c.1 Design the planning framework (objectives, problems, alternatives to solve the problem) C2
- c.2 Use techniques, tools and software to gather data C3
- d.1 Present the traffic flow data and relationships D1
- d.2 Implement team work with good management D2
- d.3 Work in a team or individually to assess the traffic situation on a road or an intersection D3

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



V. Course Content:				
• Distribution of Semester Weekly Plan of Course Topics/Items and Activities.				
A – Theoretical Aspect:				
Ord er	Topics List	Sub Topics List	Week Due	Contac t Hours
1	Introduction to basics of definition of traffic engineering aspects,	urban congestion problem, role of traffic engineer, references, what, why, how?	1	2
2	Traffic surveys design	Time, duration, techniques and tools, location, data collection, processing and analysis process, , sectors, zone and subzone study area boundary	2,3	4
3	Traffic flow studies: macroscopic and microscopic studies	Traffic flow, traffic density, traffic speed, time and distance headway, present situation assessment and future situation prediction	4,5,6	6
4	Intersections design	Conflict points, priority role, signal design, coordination method, roundabouts	7	2
5	Midterm Exam		8	2
6	Intersections design	Conflict points, priority role, signal design, coordination method, roundabouts	9,10	4
7	Traffic management techniques	Signs, marking, 3Es', MUTCD2012	11	2
8	Parking design and operation Bicycles and pedestrian facilities design	On-street parking, area parking, city parking	12	2
9	Traffic impacts on society and environment	Traffic safety, , crashes, causes and results	13	2
10	Latest technology, software	Arcady /Picady /Oscady, vissum, cers, ITS,	14,15	4
11	Final Exam		16	2
Number of Weeks /and Units Per Semester			16	32

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



B - Tutorial Aspect:			
Order	Topics List	Week Due	Contact Hours
1	Introduction to basics of definition of traffic engineering aspects,	1	2
2	Traffic surveys design	2,3	4
3	Traffic flow studies: macroscopic and microscopic studies	4,5,6	6
4	Intersections design	7,8,9	6
5	Traffic management techniques	10	2
6	Parking design and operation Bicycles and pedestrian facilities design	11	2
7	Traffic impacts on society and environment	12	2
8	Latest technology, software	13,14	4
Number of Weeks /and Units Per Semester		14	28

VI. Teaching strategies of the course:
Lecture Multimedia Presentations Discussion Demonstration Model demonstration Project method/cases study

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



VII.Assignments:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Traffic Survey design	a2, b2,b3, c1, c2, d1,d2,d3	3	3
2	Present situation evaluation	a1,a3 b1,b2,b3, c1,		
3	Future situation prediction	a1,a3 b1,b2,b3, c1,		
4	Traffic studies: Mac. and Mic.	a1,a3 b1,b2,b3, c1,		
5	Intersection designs	a1,a2,a3 b1,b2,c1, c2	6,9	4
6	Traffic management	a2, b3, c1,		
7	Parking design	a1,a2,b1, b3,c1, c2 ,d1		
8	Impacts assessments	a2,b3, c1,	11	3
9	Project/ study cases	,b2, c2,d1,d2,d3,		

VIII. Schedule of Assessment Tasks for Students During the Semester:				
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignments /quizzes	3,6,9,12	10	10%
2	Mid Term	7	10	10%
3	Group project	13	10	10%
4	Final Exam	Schedules	70	70%
	Total		100	100%

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



IX. Learning Resources:

• Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

- 1- تخطيط النقل داخل المدن، د علي عبد المنعم حسن، 1994 بيروت: دار الراتب الجامعية
- 2- هندسة النقل والمرور د محمود توفيق سالم، 1983، دار الراتب الجامعي

2- Essential References.

- 1- Traffic Analysis and design, R J Salter, 2003
- Traffic Engineering Manual, 20042
- 3- MUTCD Manual, 2012

3- Electronic Materials and Web Sites etc.

- 1- AASHTO softwares
- 2- TRL softwares
- 3- Vissum /picady /arcady /oscady /cers
- 4- Trnsit14

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas



X. Course Policies:

Unless otherwise stated, the normal course administration policies and rules of the Faculty of ----- apply. For the policy, see: -----

1	Class Attendance: The students should have more than 75 % of attendance according to rules and regulations of the faculty.
2	Tardy: The students should respect the timing of attending the lectures. They should attend within 1 minutes from starting of the lecture.
3	Exam Attendance/Punctuality: The student should attend the exam on time. The punctuality should be implemented according to rules and regulations of the faculty for midterm exam and final exam.
4	Assignments & Projects: The assignment is given to the students after each chapter, the student has to submit all the assignments for checking on time.
5	Cheating: If any cheating occurred during the examination, the student is not allowed to continue and he/she has to face the examination committee for enquiries .
6	Plagiarism: The student will be terminated from the Faculty, if one student attends the exam on another behalf according to the policy, rules and regulations of the university.
7	Other policies: -All the teaching materials should be kept out the examination hall. -The mobile phone is not allowed. -There should be a respect between the student and his teacher.

Prepared by Head of Department
Dr. Abdulkareem
Yahya Al khattabi

Quality Assurance Unit
Ass. Prof. Dr. Mohammad
Algorafi

Dean of the Faculty
Prof. Dr. Mohammed
AL-Bukhaiti

Academic Development
Center & Quality Assurance
Ass. Prof. Dr.
Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al-Qassim Mohammed Abbas