



Course Syllabus
According to JORDAN National Qualification
Framework (JNQF)

Course Name: highway design

Course Number: 04033261

General Course Information:

Course title	Highway design
Course number	04033261
Credit hours	Three Credit hours (Theory)
Education type	[Face-to-Face]
Prerequisites/corequisites	Surveying (403245), Traffic Engineering (403346)
Academic Program	Civil engineering
Program code	403
Faculty	Engineering
Department	Civil engineering
Level of course	03
Academic year /semester	1st Semester 2022-2023
Awarded qualification	B.Sc
Other department(s) involved in teaching the course	Non
Language of instruction	English
Date of production/revision	15/3/2022

Course Coordinator:

Coordinator's name	Eng. Sora Omari
Office No	4249
Office Phone extension number	2662
Office Hours	Sun, Tue, Thu (9:00-10:00) and (11:00-12:00) Mon, Wed (9:30-11:00)
Email	Sora.omari@iu.edu.jo

Other Instructors:

Instructor name	
Office No	
Office Phone extension number	
Office Hours	
Email	

Course Description (English/Arabic):

English	Importance of highways. Economic, social and political, characteristics of highways, types and classification of highways, investigation of highway route, factors affecting the geometric design of highways, stopping and passing sight distances elements and design of simple circular horizontal curves, lateral clearance on horizontal curves, super elevation, transition curves, rotation diagrams, coordination of horizontal alignment, characteristics, types and design of vertical curves, sight distance on vertical curves, highest and lowest points on vertical curves, coordination of vertical alignment.
Arabic	أهمية الطرق والنقل، تصنيف الطرق، الخصائص المؤثرة على تصميم الطريق (المركبة، السائق، المشاة)، الخصائص المرورية المؤثرة على تصميم الطرق (الحجم المروري، السرعة، الكثافة)، مسارات الطرق (المنحنيات

المستوية و المنحنيات الرأسية)، المكونات التصميمية لمسافة الرؤية على المنحنيات الأفقية و العمودية، التصميم على أساس استيعاب الطرق (تصميم الطرق السريعة و الطرق ذات المسربين و باتجاهين)، المتطلبات التصميمية لسلامة الطرق، تصريف المياه على الطرق.

Textbook: Author(s), Title, Publisher, Edition, Year, Book website.

Nicholas J.Garber, Lester A. Hole, Traffic and Highway Engineering 4thEdt. & 5thEdt. - SI Edition 2010, 2014.

References: Author(s), Title, Publisher, Edition, Year, Book website.

1. A Policy on Geometric Design of Highway and Streets AASHTO, American Association of State Highway and Transportation Officials, Washington d, c., 2004

Course Educational Objectives (CEOs):

1.	Apply fundamental knowledge of transportation engineering to choosing and analysis of transportation modes and understand the principles, which govern the behavior of the driver, the Pedestrian, the Vehicle, and the road.
2.	Understand the Design Standards of Highway Facilities, Design of Horizontal and Vertical Alignment, Special facilities in Steep Grades, Computer Use in Geometric Design.

Intended Learning Outcomes (ILO's):

1.	Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire:	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
2. A	Knowledge and Understanding:				
3. A1	Apply fundamental knowledge of transportation engineering to choosing and analysis of transportation modes	1,2	1	3	k
4. A2	Understand the principles which govern the behaviour of the driver, the Pedestrian, the Vehicle, and the road.	1,2	1	1	k
5. A3	Understand the Design Standards of Highway Facilities, Design of Horizontal and Vertical Alignment, Special facilities in Steep Grades, Computer Use in Geometric Design.	1,2	2	1	c
6. B	Intellectual skills:				
7. B1					
8. B2					
9. B3					
10. C	Subject specific skills:				
11. C1	apply the appropriate Computer tools to design of Highway Facilities	1,2	5,7	3	c

12. C2					
13. C3					
14. C4					
15. D	Transferable skills:				
16. D1					
17. D2					
18. D3					

*Bloom Taxonomy Levels

Level #	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

**** Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.**

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (CE) program will demonstrate:		Descriptors**		
		K	S	C
1.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	✓		
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.			✓
3.	An ability to communicate effectively with a range of audiences.		✓	
4.	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.			✓
5.	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.		✓	
6.	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.		✓	
7.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	✓		✓

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule

✓ Face to Face

Week	First Hour + Second Hour + Third Hour	Ach. ILOs	Ach. PLOs	Descriptors*
1	Transportation Engineering Review	A1	1	K

2	Highway Functional Classification & Traffic operation	A1	1	K
3	Geometric Design of Highway Facilities	A1,2,3	2	C
4	Geometric Design of Highway Facilities	A1,2,3	2	C
5	Highway Design Standards	A1,2,3	2	C
6	Highway Design Standards	A1,2,3	2	C
7+8+9	Highway Surveys and Location, Preparation of Highway Plans, Mass Haul Diagram.	A2,3	2	C
10+11+12	Design of Horizontal and Vertical Alignment	A2,3	2	C
13	Intersection Design.	A2,3	2	C
14	Computer Use in Geometric Design.	C1	5,7	C
15	Computer Use in Geometric Design.	C1	5,7	C
Final Exam				

* K: Knowledge, S: Skills, C: Competency

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Interactive videos
- Practice Labs
- Discussion Forums
- Quizzes
- Other Interactive online activities
- Reports

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **20%**
- Midterm **30%**
- Final Exam **50%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to the IU E-Learning Platform at:**
<https://elearn.iu.edu.jo/course/view.php?id=2105>
- **E-learning plan**
- **Satisfaction questionnaires for online and face-to-face learning**
- **Software for e-learning**
- **Training**

Assessment Tools implemented in the course:

- ✓ Final Exam
- ✓ Midterm Exam
- ✓ Homework
- ✓ Discussion Forums
- ✓ Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching
- Others: Quiz

Responsible Persons and their Signatures:

Course Coordinator	Eng. Sora Omari	Completed Date	25/ 6 / 2022
		Signature	
Received by (Department Head)	Dr. Ibrahim Varooqa	Received Date	25/ 6 / 2022
		Signature	