



The Hashemite University  
Faculty of Engineering  
Civil Engineering Program  
Course Syllabus



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**Course Title:** Highway Engineering & Design      **Course Number:** 110401368  
**Designation:** Compulsory      **Prerequisite(s):** 110401365 Surveying  
**Instructor:** Dr. Yahia Khalayleh      **Instructor's e-mail:** [yahia@hu.edu.jo](mailto:yahia@hu.edu.jo)  
**Office Hrs.** Mon, Wed 11.00 – 12.00

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**Course description:** Street and highway functional classifications and types of lanes. Highway cross-section elements. AASHTO geometric design standards. Passing & stopping sight distance & superelevation. Design of horizontal and vertical curves, earthwork operations and mass haul diagram. Intersection types and design, parking facilities and highway drainage design.

**Textbook(s):** Traffic & Highway Engineering by Nicholas Garber and Lester Hoel, Fourth Edition, Brooks/Cole.

**Other references:** Introduction to Transportation Engineering, by James H. Banks published by Mc Graw Hill. And highway engineering by Paul H. Wright. Traffic Engineering by Roger.P.Roess.....Transportation Engineering by C.Jotin Khisty

**Major Topics Covered:**

TOPICS	No. of Weeks	Contact Hours*
Introduction	1	3
Cross-Section Elements	1	3
Sight Distances	2	6
Horizontal Alignment	3	9
Vertical Alignment	3	9
Parking Facilities	1	3
Intersection Design	2	6
Highway Drainage	2	6
<b>TOTAL</b>	<b>15</b>	<b>45</b>

\*Contact hours include lectures, quizzes and exams

**Specific Outcomes of Instruction (Course Learning Outcomes):** Upon the completion of this course, the students are expected to achieve the following:

- 1- Considerable knowledge of Highway classification & cross-section elements, and enable the students to design H&V alignment and to apply the AASHTO standards for highway geometric design. **1,2**
- 2- To enable the student to estimate the earthwork quantities (Volume of Cut & Fill). **2**
- 3- Introducing students to intersection design and to provide them with a considerable knowledge of intersection types. **2**
- 4- To be able to estimate the surface water runoff & to design the Highway drainage structure. **2**



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**Student Outcomes (SO) Addressed by the course:**

ABET a-k	Outcome description	Contribution
	General Engineering Student Outcomes	
1	An ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science & mathematics.	M
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.	H
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.	
<b>H = High, M = Medium, L = Low</b>		

**Class/laboratory schedule:** 3 class sessions each week; 50 minutes each.

**Grading Plan:**

Project (30 Points)

Midterm Exam (30 Points)

Final Exam the registrar will announce (40 Points)

**General Notes:** A team design project is required. The project will involve geometric design of a road 2km long. This will include design of horizontal & vertical alignment, and finding the quantities of cut & fill for the project.