

1. Course Name:	
Transportation Engineering 1	
2. Course Code:	
CIV41103	
3. Semester / Year:	
Semester	
4. Description Preparation Date:	
1-9-2025	
5. Available Attendance Forms:	
Weekly (Theory: 3hours, Practically: 1 hours)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Theory: 45 Hours Practically: 15 hours Total: 60 hours Total Units: 6	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Adil N. Abed Email: adil.abed@muc.edu.iq	
8. Course Objectives	
Course Objectiv	1.To understand the factors influencing horizontal and vertical alignment design in highways, including safety, driver comfort, sight distance, and topographic constraints. 2. To analyze and apply design standards and guidelines, such as the AASHTO, in the development of horizontal and vertical alignment for highways. 3. Evaluate and compare different alignment alternatives, considering factors such as curvature, superelevation, grade transitions, and sight distance requirements. 4. To consider the impacts of alignment design on safety, traffic operations, and roadway aesthetics. 5. Assess the interaction between horizontal and vertical alignment in highway design and address potential conflicts. 6. Collaborate effectively with other students in the development of alignment design solutions, including teamwork, communication, and sharing of responsibilities. 7. Critically evaluate and discuss case studies and real-world examples of highway alignment design projects, identifying successes, challenges, and lessons learned. 8. Demonstrate the ability to present and communicate alignment design concepts and solutions effectively through written reports, presentations,

	and design drawings.				
9. Teaching and Learning Strategies					
Strategy	1. By the completion of this course, this student will be able to: 2. select the best route to construct the highway, 3. estimate the amount of earthwork resulted from highway construction, 4. Estimate the design sight distance for highways. 5. Design the vertical alignment of the highway 6. Design the horizontal alignment of the highway 7. Design and demonstrate the combination of vertical and horizontal alignment of highway 8. Design a cross section for the highway				
9. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Th.:3 Pr.: 1	Introduction.	Highway Functions: principles	Lect. & Lab.	Exam H.W Report
2	Th.:3 Pr.:1	Cross Section Elements	Design a cross section for the highway	Lect. & Lab.	Quiz H.W report
3	Th.3 Pr.: 1	Route survey	Office Study of Existing Information, Reconnaissance Survey for road	Lect. & Lab.	Homework route selecti
4	Th.:3 Pr.:1	Route selection alternative	Preliminary Location Survey, Final Location Survey,	Lect. & Lab.	Exam report
5	Th.3 Pr.: 1	Mass Haul Diagram	Computing Earthwork Volumes Free-Haul Distance, Overhaul Distance (O. H. D), Limit of Economical Haul (L. E. H.)	Lect. & Lab.	Quiz
6	Th.:3 Pr.: 1	Element of Design Basic Principles	Simple Curve, Transition and Spiral Curves	Lect. & Lab.	H.W report
7	Th.:3 Pr.:1	Element of Design Horizontal Alignm	Sight Distance, Vehicle Kinematics, Stopping Sight Distance	Lect. & Lab.	Exam
8	Th.:3 Pr.: 1	Element of Design Horizontal Alignm	Superelevation, Widening, minimum set back .	Lect. & Lab.	Quiz H.W report
9	Th.:3 Pr.: 1		Mid Term Exam 1	Lect. & Lab.	Exam
10	Th.:3 Pr.: 1	Element of Design Vertical Alignment	Critical Length of Upgrade	Lect. & Lab.	H.W report

11	Th.:3 Pr.: 1	Element of Design Vertical Alignment	Crest Curve, Sag Curve, Solving Examples	Lect. & Lab.	Quiz
12	Th.:3 Pr.: 1	Element of Design Vertical Alignment	v. curve length design, according to sight distance, driving comfort. drainage	Lect. & Lab.	Homework
13	Th.:3 Pr.: 1	.	Mid Term Exam 1	Lect. & Lab.	Exam
14	Th.:3 Pr.: 1	Combinations of Horizontal and Vertical Alignment	Method of design criteria	Lect. & Lab.	Quiz
15	Th.:3 Pr.: 1	Review	Preparatory week before the final exam	Lect. & Lab.	report

10. Course Evaluation

The grade distribution is as follows:

Assessment: Formative 40 marks, Monthly exam 10 marks

Final exam: Theory 40 marks, Practical 10 marks

11. Learning and Teaching Resources

Required textbooks (curricular books any)	A Policy on Geometric Design of Highways and Streets.” American Association of State Highway and Transportation Officials (AASHTO), 2011.
Main references (sources)	Garber, Nicholas, J. and Lester A. Hoel. Traffic and Highway
Recommended books and references (scientific journals, reports...)	Transportation research Board (TRB), Washington D.C., 2000
Electronic References, Websites	Transportation Engineering Journal ScienceDirect.com by Elsevier

Course Description Form

