Module (Course Syllabus) Catalogue

2024-2025

College/ Institute	**Erbil Technical Engineering College**	
Department	**Civil Engineering**	
Module Name	**Transportation Engineering**	
Module Code	**TRE 801**	
Degree	**Technical Diploma** ☐ **Bachelor** √ **High Diploma** ☐ **Master** ☐ **PhD** ☐	
Semester	**8th**	
Qualification	**B.Sc.**	
Scientific Title	**Assistant Lecturer**	
ECTS (Credits)	**6**	
Module type	**Prerequisite** ☐ **Core** √ **Assist.** ☐	
Weekly hours	**5**	
Weekly hours (Theory)	**(3) hr Class**	**(118) Total hrs Workload**
Weekly hours (Practical)	**(2) hr Class**	**(44) Total hrs Workload**
Number of Weeks	**12**	
Lecturer (Theory)	**Byad A. Ahmed**	
E-Mail & Mobile NO.	**byad.ahmed@epu.edu.iq**	
Lecturer (Practical)	**Tava Dhahir**	
E-Mail & Mobile NO.	**tava.mohammed @epu.edu.iq**	
Websites		

Course Book

Course Description	***TRE 801 Transportation Engineering*** is a 6-credit hour and 6-unit undergraduate senior level course (3 hours for Theoretical and 2 hours for Laboratory Tests). This course primarily focuses on fundamental understanding of the design and operation of facilities which enable us to move persons and goods from one place to another efficiently and economically, and all aspects of asphalt technology including asphalt binder, aggregate and combination of the two as an asphalt mixture.
Course objectives	Students must demonstrate the ability to: 1- To introduce the students with the principles and practice of transportation which focuses on Traffic and Transportation Engineering and Highway Engineering. 2- To enable the students to have a strong analytical and practical knowledge of Planning, Designing and solving the transportation problems. 3- To introduce the recent advancements in the field of Traffic Engineering and Management, Transport Planning, Highway Design and Construction, Economic and Environment Evaluation of Transport Projects. Students gain experimental knowledge of how to prepare, check, and test few types of pavement materials during their lab sessions.
Student's obligation	**12. Student's obligation: Expectations of the Student:** ***Professionalism*** All assignments and class participation should be conducted in a professional manner. Attention to detail on class assignments and communication is important and is part of the learning experience and is included in part of student evaluation. ***Attendance*** Attendance is strongly suggested. We will do activities in class that will help in your learning of the material that cannot be duplicated outside of the classroom. If you are going to miss a class, I suggest that you email me before with a reason stating why you will miss class. If you are on the border for a grade, I will consider attendance. ***Late Work*** Late work is NOT accepted. The due date for each assignment is clearly indicated and the work must be turned in at the start of class unless indicated otherwise. Exceptions can only be granted in the most extenuating circumstances and when a written proof can be presented or permission has been obtained from the instructor at least 24hrs in advance.

<table>
<tr><td>Required Learning Materials</td><td colspan="5">Various pedagogical mechanisms we will apply for teaching this class, such as, quizzes, homework’s, and reports. As well all students will receive weekly handouts for the lectures.</td></tr>
<tr><td rowspan="11">Evaluation</td><td colspan="2">Task</td><td>Weight (Marks)</td><td>Due Week</td><td>Relevant Learning Outcome</td></tr>
<tr><td colspan="2">Paper Review</td><td></td><td></td><td></td></tr>
<tr><td rowspan="6">Assignments</td><td>Homework</td><td>5%</td><td></td><td></td></tr>
<tr><td>Class Activity</td><td>2%</td><td></td><td></td></tr>
<tr><td>Lab. Report</td><td>10%</td><td></td><td></td></tr>
<tr><td>Seminar</td><td>5%</td><td></td><td></td></tr>
<tr><td>Essay</td><td></td><td></td><td></td></tr>
<tr><td>Project</td><td>5%</td><td></td><td></td></tr>
<tr><td colspan="2">Quiz</td><td>8%</td><td></td><td></td></tr>
<tr><td colspan="2">Lab.</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Midterm Exam</td><td>25%</td><td></td><td></td></tr>
<tr><td colspan="2">Final Exam</td><td>40%</td><td></td><td></td></tr>
<tr><td colspan="2">Total</td><td>100%</td><td></td><td></td></tr>
<tr><td>Specific learning outcome:</td><td colspan="5">1- To strength the students’ knowledge for how to be efficient Transport Engineers.
2- Produce a plan for the community that has broad support among the residential and business communities being served and the transports agencies that provide services.
3- Create a safe and attractive driving environment for traveling through the improvement of streetscape conditions.
4- It is Essential for the economy and general development of country.
5- It is Essential for strategic movement in emergency for defence of the country and maintain better law and order.</td></tr>
<tr><td>Course References:</td><td colspan="5">Course Reading List and References:
Required Textbook or Other Materials:
1. “Highway Engineering” by: Darkson H. Oglisby.
2. “Route Location & Design” by: Thomas F. Hikerson.
3. “A Policy on Geometric Design of Highway” by: AASHTO.
4. “Principles of Highway Engineering and Traffic Analysis” 4th Edition, by: FRED , SCOTT, WALTER.
5. “Traffic Engineering” by: Natson, Smith & Hurd.
6. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 31st Edition, 2011.</td></tr>
</table>

Course topics (Theory)	Week	Learning Outcome
1- Introduction and Course Logistic	1	1
2- Transportation Engineering	2	1
3- Transportation Systems	2-3	1,2
4- Lab Seasons (Asphalt Tests)	3	1,2
5- Highway Classification	3-4	2
6- Earthwork Calculation	4-5	2
7- Speed Studies	5-6	2
8- Geometric Design:	6	3
9- Elements & Control	7	3
10- Sight Distance	7-8	3
11- Horizontal Alignment	9	4
12- Circular Curves & Spiral	10	
13- Vertical Alignment	10-12	
14- Pavement Design	13-14	
Practical Topics	**Week**	**Learning Outcome**
1- Soil tests.	1	
- Gradation, Atterberg Limits and Index, Laboratory Compaction	1	
- CBR Test.	2	
- Sand Cone Test.	2	
2- Aggregate tests.	3	
- Specific Gravity and Water Absorption Test, Bulk Density of Aggregate.	3-5	
- Abrasion Test (L.A. Abrasion Test) , Aggregate Impact Test, Aggregate Gradation and Blending.	5-7	
3- Bitumen tests.	8-9	
Specific Gravity Test, Penetration Test, Ductility Test, Softening Point Test, Viscosity 6. Flash and Fire Point, Loss on Heating.	10-12	

Questions Example Design:

Question 1: What is the transportation planning?

Answer:

Transportation planning is also commonly referred to as **transport planning** internationally, and is involved with the evaluation, assessment, design and siting of transport facilities (generally streets, highways, bike lanes and public transport lines).

Question 2: List the most important lab tests for bitumen?

Answer:

1. Bitumen content. 2. Ductility of Bitumen. 3. Penetration of Bitumen.
4. Specific Gravity of Bitumen. 5. Softening Point of Bitumen.
6. Flash and Fire Point of Bitumen. 7. The Marshall Stability of Bituminous Mixture.

Question 3: A highway has a design speed of 70 mph and super elevation rate of 0.01. If f_s= 0.15, what should be the radius of the curve?

Answer: $R = V^2 / [15 (f_s + e)]$

$= 70^2 / [15 * (0.15 +0.01)] = 2042$ (ft)

Extra notes:

- The syllabus is subject to change at the discretion of the instructor as course or other circumstances require.
- Students with documented disabilities are encouraged to discuss with me arrangements that will enhance their learning in this class.
- Students are expected to act with utmost caution and great care of each instrument and materials in laboratory during their presence.
- Students with any kind of problem should contact the instructor as soon as possible.

Using cell phones is not allowed at all, MUST be OFF and invisible please.

Note: **All Communications will be done only via MOODLE.**

External Evaluator

After reviewing the course book, I found that the contents is very good satisfying the aim and objectives of the transportation subject course. It also fulfils and covers the main subjects of Transportation, Traffic and Highway Engineering. As an expert (Assistant Professor in civil engineering Specialisation in Transportation, I fully agree with the contents for the 4th -year civil engineering department.

Dr. Mereen Hasan Fahmi
Professor
Civil Engineering

Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the engineering profession