



North South University
Department of Civil and Environmental Engineering (CEE)

CEE 250: Introduction to Transportation Engineering
Spring 2018
Course Syllabus

INSTRUCTOR: JBr - Prof. Javed Bari, PhD, PE, FIEB
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CLASS HOURS: Sec-1: MW 1:00 pm – 2:30 pm (Room#SAC 304)
Sec-2: MW 2:40 pm – 4:10 pm (Room#SAC 207)

STUDENT COUNSELING HOURS: S-T-R 11:30 pm – 12:30 pm, M-W 10:00 am – 11:00 am

CREDIT HOURS: 3

COURSE DESCRIPTION:

Transportation systems; Transportation economics; Land-use, vehicle and human characteristics in transportation; Geometric design of roadways and railways; Roadway and railways materials; Bituminous mix design; Traffic loading and volume; Design of flexible and rigid pavements; Pavement construction, distresses and maintenance; Introduction to railway and waterways. Design labs on bituminous mix design and pavement design are embedded in the course to reinforce the theories discussed in the lectures.

DETAIL COURSE CONTENTS:

- Transportation Systems, Land use, and Economics;
- Vehicle and human Characteristics;
- Geometric design of roadways;
- Roadway materials and their characteristics;
- Bituminous mix design;
- Distresses in pavements;
- Pavement maintenance;
- Traffic loading and volume;
- Design of flexible and rigid pavements;
- Introduction to Railway Engineering;
- Introduction to Waterways Engineering.

TEXTS:

1. ***Transportation Engineering: An Introduction (3rd edition)*** – by: C. Jotin Khisty and B. Kent Lall. Publisher: Pearson-Prentice Hall, USA.
2. ***Hot Mix Asphalt Materials, Mixture Design and Construction (2nd or 3rd edition)*** – by: E R Brown, Prithvi S Kandhal, Freddy L Roberts, Y Richard Kim, and Dah-Yinn Lee. Publisher: NAPA Research and Education Foundation (NCAT), USA.
3. ***Pavement Analysis and Design (2nd or latest edition)*** – by: Yang H. Huang. Publisher: Pearson-Prentice Hall, USA.

COURSE OBJECTIVES:

1. Provide students with an understanding of the basic principles and practices of the various fields of Transportation Engineering.
2. Prepare students for the design and analysis of practical engineering problems related to roadway and railway geometry, bituminous mixture and various types of pavements.

MAPPING OF COURSE OUTCOME-PROGRAM OUTCOME (CO-PO):

Sl.	CO Description	Program Outcome ¹	Bloom's taxonomy Domain /level ²	Delivery methods and activities	Assessment tools
CO1	Comprehend the vast field of modern Transportation Engineering at an introductory level.	PO-1	A1, C2	Lecture, Notes, Video	Quiz and Homework
CO2	Analyze real engineering problems related to various modes of transportation and take realistic engineering decision based on that analysis.	PO-2	A3, C4, P4	Lectures, Notes, Software, Practice Problems	Mid & Final Exams
CO3	Identify and analyze the design requirements and conduct accurate geometric design of roadway and railway, mix design of bituminous mixtures, and materials & structural design of various types of pavements.	PO-3	C5, C6, P5	Lectures, Notes, Software, Practice Problems	Design Exam(s)

Notes:

1. BSCEE Program Outcomes (POs):

- PO - 1: Engineering Knowledge
- PO - 2: Problem analysis
- PO - 3: Design/development of solutions
- PO - 4: Investigation
- PO - 5: Modern tool usage
- PO - 6: The engineer and society
- PO - 7: Environment and sustainability
- PO - 8: Ethics
- PO - 9: Individual work and teamwork
- PO - 10: Communication
- PO - 11: Project management and finance
- PO - 12: Life-long learning
- PO - 13: Contemporary Issues.

2. Domains and Levels of Bloom's Taxonomy

- "Cognitive" Domain (C): C1 - Recall data, C2 - Understand, C3 - Apply, C4 - Analysis, C5 - Synthesize, and C6 - Evaluate.
- "Affective" Domain (A): A1 - Receive, A2 - Respond, A3 - Value, A4 - Organize personal value system, and A5 - Internalize value system.
- "Psychomotor" Domain (P): P1 - Imitation, P2 - Manipulation, P3 - Develop precision, P4 - Articulation, and P5 - Naturalization.

AVAILABILITY OF COURSE MATERIALS:

All lecture notes and relevant materials like exam notice, class schedule, course outline, reading materials, etc. are available at the university's common folder "Resource".

COURSE EVALUATION:

Attendance and class participation	15%
Homework(s)	15%
Design Exams	20% (= 10%+10%)
Quizzes	10%
Midterm Exam	20%
Final Exam	20%
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Total	100%

EXAM POLICY:

The format of the tests will be based on a combination of multiple choice or short questions as well as descriptive questions. Students are thus advised to prepare for any type of questions. Usually no makeup for class test is made. NO MAKE UP MID-TERM OR FINAL EXAM WILL BE ARRANGED UNLESS AN ABSOLUTELY UNAVOIDABLE VALID REASON FOR ABSENCE IS FOUND. For such unavoidable circumstances, written explanation of the situation must be submitted before the exam. If any class test or mid-term exam cannot be held on the due date, the exam will be automatically shifted to the very next available class, unless otherwise announced.

EXAM NOTICE:

Prior notices for will be provided in the class, except for a sudden quiz. No excuse will be granted simply because someone was absent at previous class and did not know the exam notice.

GRADING POLICY:

Generally, NSU grading policy will be followed. However, minor deviation is still possible depending on the situation.

CODE OF CONDUCT:

It is highly requested to maintain discipline in the class like not to be late, refrain from making noise during lecture time, not to leave the class early. If someone is more than 10 minutes late in the class, (s)he may not get attendance for the class. Adopting unfair means in the exams will be considered as a serious crime and the student shall be placed to the university disciplinary committee. Evidence of copying assignments shall be seriously punished.

LECTURE SCHEDULE:

* One Day = 1.5 lecture hours, Total 24 days lecture = 36 lecture hours

Day*	Outcome/ Material Covered	Reference Reading	Activity	Due
Day-1	Course overview & Introduction	-	Discussion	-
Day-2	Transportation System & Land Use	Chap-1, 3 [JK]	Lecture	-
Day-3	Transportation Economics	Chap-2 [JK]	Assign HW-1	-
Day-4	Vehicle & Human Characteristic	-do-	Lecture	-
Day-5	Vehicle & Human Char ^s , cont'd	-do-	Lecture	HW-1 Due
Day-6	Geometric Design	Chap-6 [JK]	Quiz-1+Lec.	-
Day-7	Geometric Design, cont'd	-do-	Lecture	-
Day-8	Geometric Design, cont'd	-do-	Lecture	-
Day-9	Roadway materials	Chap-4 [HMA]	Assign HW-2	-
Day-10	Roadway materials' characterization	Chap-4 [HMA]	Lecture	-
Day-11	Asphalt concrete production	Handout	Lecture	HW-2 Due
Day-12	Mid Exam	-	Exam	-
Day-13	Bituminous mix design	Chap-4 [HMA]	Lecture	-
Day-14	Bituminous mix design, cont'd	Chap-4 [HMA]	Lecture	-
Day-15	Pavements and distresses in pavements	Huang	Lecture	-
Day-16	Design Exam-1+Quiz-2	Huang	Exam	-
Day-17	Traffic loading and volume	Huang	Assign HW-3	-
Day-18	Design of flexible pavements	Huang	Lecture	-
Day-19	Design of flexible pavements	Huang	Lecture	HW-3 Due
Day-20	Design of rigid pavements	Huang	Lecture	-
Day-21	Design of rigid pavements	Huang	Lecture	-
Day-22	Design Exam-2+Quiz-3	Huang	Exam	-
Day-23	Railway Engineering	Handout	Lecture	-
Day-24	Waterways Engineering	Handout	Lecture	-
Final Exam (As per schedule declared by NSU)				