



Меѓународен Универзитет Визион - International Vision
UniversityUniversitetiNdërkombëtarVizion - UluslararasıVizyonÜniversitesi

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SYLLABUS

COURSE NAME	COURSE CODE	SEMESTER	COURSE LOAD	ECTS
RAILWAY CONSTRUCTION - RAILWAY ENGINEERING	CIV-2010	4	150	5

Prerequisite(s)	None
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Course Language	Macedonian, Turkish, English
Course Type	Required
Course Level	First Cycle
Course Lecturer	
Course Assistants	
Classroom	
Extra Curricular Office Hours and Location	Meeting: Consultancy:

Course Objectives	The purpose of the course is to teach the geometric and physical design and dimensioning principles of railway lines.
Course Learning Outcomes	<ul style="list-style-type: none"> To learn the scope of transportation engineering and raise awareness about sustainable practices. To understand the basic concepts of transition research and to be able to make earthworks calculations. Modeling the movement of the railway vehicles. To learn the design features of horizontal and vertical geometric components of railway lines. Dimensioning the superstructure elements.
Course Contents	Introduction to transport: Fundamentals of transport systems / Sustainable transport systems/transit research and zero polygon / Plan, Cross-section; definition of earthworks; types of earthworks: splitting and filling/ Types and properties of soils; heave and settlement of soils; calculation of cross-sectional areas/ Volume calculations; properties of the masses diagram / Balancing in the masses diagram; earthworks cost/ Definition of the railway; types and characteristics of rolling stock and towed railway cars/ Rolling motion and obtaining the general equation of motion; forces of resistance that oppose the movement of the train/ Phases in the rolling stock movement: acceleration, constant velocity, and deceleration/ Types of the longitudinal slope; determining the horizontal radius of the curve; transfer and merge curve calculations / Cross-section types and clearance limits in single and double track railways; Calculation of the number of passengers and goods trains required by the traffic / Features and tasks of railway superstructure/ Superstructure elements: Rail, sleeper, fasteners and ballast / Design and dimensioning of railway

	superstructure.
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WEEKLY SUBJECTS AND RELATED PREPARATION STUDIES

Week	Subjects	Related Preparation
1	Introduction to transportation: Basic features of transportation systems / Sustainable transport systems	Related Chapters of Course Sources
2	Introduction to Railway Engineering, rolling stock. General equation of motion and rolling motion.	Related Chapters of Course Sources
3	Introduction to Railway Engineering, rolling stock. General equation of motion and rolling motion. Resistance forces. Gravity and resistance forces diagram. Movement phases of the train: acceleration, constant speed movement, and deceleration. Quantities that can be calculated under certain conditions.	Related Chapters of Course Sources
4	Longitudinal slopes. Horizontal curves, theoretical and application superelevations.	Related Chapters of Course Sources
5	Types of superelevations, application of superelevations. Quantities that can be calculated under certain conditions. Description of the assignment.	Related Chapters of Course Sources
6	Joining curves, cross-section types. Calculation of the number of passengers and goods trains required by the traffic. Assistant applications.	Related Chapters of Course Sources
7	Elements of railway superstructure. Dimensioning of the superstructure, dynamic effect coefficient. Forcing the superstructure; Rail, sleeper, ballast, and ground calculations and investigations.	Related Chapters of Course Sources
8	Forcing the superstructure; Rail, sleeper, ballast, and ground calculations and verifications (continued). Assistant applications.	Related Chapters of Course Sources
9	Forcing the superstructure; Rail, sleeper, ballast, and ground calculations and verifications (continued). Assistant applications.	Related Chapters of Course Sources
10	Topographic maps, transition survey, zero polygon, transition elements, and transition axis. Plan, cross-section, the definition of the crossing, and cross-section drawings. Cross-section elements, slopes, classification of soils, heaving, and settlement of soils.	Related Chapters of Course Sources
11	Cross-section areas, area calculations, and applications. Soil volumes, volume calculations. Volume calculations applications. Table of Volumes (example).	Related Chapters of Course Sources
12	II. Description of the assignment. Audiences Diagram and its properties. Cost equations, KTU-M diagram.	Related Chapters of Course Sources
13	First and Second Degree Balancing and Cost Calculations. Balancing applications and Brukner Method.	Related Chapters of Course Sources
14	First and Second Degree Balancing and Cost Calculations. Balancing applications and Brukner Method.	Related Chapters of Course Sources
15	First and Second Degree Balancing and Cost Calculations. Balancing applications and Brukner Method.	Related Chapters of Course Sources
16	Midterm exam 2	

ECTS / WORKLOAD TABLE

Presentation / Seminar			
Hours for off-the-classroom study (Pre-study, practice)	14	3	42
Midterm Exam	1	12	12
Final examination	1	14	14
Total Work Load			
ECTS		5	

GENERAL PRINCIPLE RELATED TO COURSE

Dear students,

In order to be included, learn and achieve full success that you deserve in the courses you need to come well prepared by reading the basic and secondary textbooks. We are expecting from you carefully to obey to the course hours, not to interrupt the lessons unless is very indispensable, to be an active participant on the courses, easily to communicate with the other professor and classmates, and to be interactive by participating to the class discussions. In case of unethical behavior both in courses or on exams, will be acting in framework of the relevant regulations. The attendance of the students will be checked in the beginning, in the middle or at the end of the lessons. Throughout the semester the students who attend to all lectures will be given 15 activity-attendance points in addition to their exam grades.

SOURCES

COMPULSORY LITERATURE		
No	Name of the book	Author's Name, Publishing House, Publication Year
1	Toprak İşleri ve Demiryolu,	İnal Seçkin, Çağlayan Kitabevi, 2003.
2	Karayolu Mühendisliği,	Nadir Yayla, Birsen Yayınevi, 2002.
3	Karayolu Projesi Temel Bilgileri,	Tuğba Kiper, YTMK, 2002.
4	W.W. Hay, Railroad Engineering,	John Wiley & Sons.

EVALUATION SYSTEM

Underlying the Assessment Studies	NUMBER	PERCENTAGE OF GRADE
Attendance/Participation	15	%10
Project / Event	1	%20
Mid-Term Exam	1	%35
Final Exam	1	%35
TOTAL	17	%100

ETHICAL CODE OF THE UNIVERSITY

In case of the students are cheating or attempt to cheat on exams, and in the case of not to reference the sources used in seminar studies, assignments, projects and presentations, in accordance to the legislations of the Ministry of Education and Science of Republic of Macedonia and International Vision University, will be applied the relevant disciplinary rules. International Vision University students are expected never to attempt to this kind of behavior.