

COURSE OUTLINE

(1) GENERAL

SCHOOL	UNIVERSITY OF THESSALY		
ACADEMIC UNIT	DEPARTMENT OF CIVIL ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΣΥ0800	SEMESTER	9th
COURSE TITLE	Special Topics in Highway Engineering		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
-		4	6
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialized general knowledge, skills development</i>	Specialized general knowledge		
PREREQUISITE COURSES:	• Highway Engineering I • Highway Engineering II • CAD. Computer Aided Design • Surveying		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	-		

(2) LEARNING OUTCOMES

Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i> <i>Consult Appendix A</i> • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes
The aim of this course is to develop students' skills in the study of the design and operation of at-grade intersections, road project design using specialized software, the design and implementation of vehicle restraint systems, construction site signage, and road safety inspections. Specifically, regarding the study of the design of road intersections, the course aims to present the basic elements of geometry and operation, the formulas used, the dimensional standards of the design guidelines for at-grade intersections, as well as the methodologies for designing various types of at-grade intersections. Upon successful completion of the course, students will possess all the knowledge necessary to address specialized issues related to road design and construction, road safety inspections, and vehicle restraint systems. Students will have the opportunity to learn the design specifications of road intersections and be trained on commercial software they will encounter in their professional or research careers. This practical training will adequately prepare them for entering the professional market as well as for continuing their studies at the research level.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
thinking Working in an interdisciplinary environment
Production of new research ideas

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive
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Others...
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The purpose of the course is to provide students with the knowledge, necessary tools, and strategies required in order to:

- Understand and apply the basic principles of the geometry and operation of at-grade intersections.
- Use specialized road design software.
- Design and analyze vehicle restraint systems.
- Evaluate road safety and conduct inspections.
- Design and organize construction site signage.
- Address practical issues in road design and construction studies.
- Collaborate in teams to solve technical problems.
- Prepare for their professional and research careers.

(3) SYLLABUS

1. The Use of Computers in Road Project Design
2. C.A.D. and G.I.S. Applications in Design
3. Digital Terrain Models
4. Road Projects Design Software
5. Road Projects Design Software
6. Road Projects Design Software
7. Road Projects Design Software
8. Basics on Junctions Design
9. Basics on Interchanges Design
10. Special topics of Road Infrastructure Design
11. Road Restraint Systems
12. Road Infrastructure Design at Work zones
13. Road Safety Audit Procedures
14. Road Safety Audit Procedures

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	The course is delivered face-to-face. During the delivery of the course topics, visual aids will be used to display the lessons through the projector in the classroom. Additionally, educational videos and specialized road design software will be utilized for the study, design, and optimization of at-grade intersections and road projects. Finally, the training material will be available on the e-learning platform eClass (https://eclass.uth.gr/) so that students can refer to the material at any time. At the same time, there will be direct
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	communication with students for resolving questions via email.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	E-CLASS, Cloud, Email, etc.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non- directed study according to the principles of the ECTS</i>	<i>Activity</i>	<i>Semester workload</i>
	Lectures	50%
	Laboratory	30%
	Exercises	20%
	Course total	100%
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple-choice questionnaires, short-answer questions, open- ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Language of examinations: Greek - Homework: a) Written 30% and b) Oral 10% - Class project: Oral 60%	

(5) ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

OMOE (National Road Design Guidelines)
 Geometric Design of Highways & Streets [AASHTO 2004]
 Roundabouts. An informational Guide 2nd Edition 2010 NCHRP rep. 672
 Handbook of Road Safety Measures 2ND edition, Rune Elvik et al
 Handbook of Road Technology, Fourth Edition M.G.LAY
 HIGHWAY DESIGN, Theory & Practice (A. Apostoleris)
 Highway Design & Construction Henning Natzschka

- Related academic journals:

World Highways
 Routes/Roads Magazine (PIARC)