

## 1. GENERAL

<b>SCHOOL</b>	Environment and Agricultural Engineering		
<b>ACADEMIC UNIT</b>	Department of Natural Resources Development & Agricultural Engineering		
<b>LEVEL OF STUDIES</b>	Master		
<b>COURSE CODE</b>	630006	<b>SEMESTER</b>	1 <sup>nd</sup>
<b>COURSE TITLE</b>	Special issues of Water Resources Management		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <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>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
Lectures and laboratory exercises	3	5	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge		
<b>PREREQUISITE COURSES:</b>			
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	English		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes (English)		
<b>COURSE WEBSITE (URL)</b>	<a href="https://oeclclass.aua.gr/eclclass/courses/AFPGM151/">https://oeclclass.aua.gr/eclclass/courses/AFPGM151/</a>		

## 2. LEARNING OUTCOMES

## Learning outcomes

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.

Consult Appendix A

- 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

## Emphasis on infrastructure, sustainability, and in crisis contingency

The course has the following objectives:

- To show a comprehensive framework for the presentation of infrastructure projects.
- To combine technical issues such as infrastructure, with issues such as operation and maintenance costs, the social environment, institutional framework, and infrastructure protection and security measures from non-inherent technological risks, etc.
- To emphasize the interdependence of technology and society and the methodology of their approach, especially in infrastructure management issues.

The course analyzes infrastructure projects involving physical systems for six domains (transportation, water, environment, energy, built environment, and communications). The course prepares students to manage these systems in engineering in general, construction, and public works administrative work. In this context, it highlights how an ever-increasing technological infrastructure combined with a parallel and rapidly changing socio-economic context, has contributed to new conceptual, methodological and political approaches. The course trains students to understand that

- Infrastructure management involves multiple objectives, multiple decision makers, multiple users, and multiple stakeholders and interest groups.
- Upon successful completion of the course the student will be able to:
- Have an understanding of the basic and critical characteristics of infrastructure use and management
- Have knowledge of the tools and techniques and how they are used to ensure their successful management at a specified time and within budget.
- Collaborate with fellow students to create and present a Management plan in a project case study that includes Objectives, Task Structure Analysis, Time Scheduling and Budget, Synthesis of results.

## 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

Project planning and management

Respect for difference and multiculturalism

Adapting to new situations

Respect for the natural environment

Decision-making

Showing social, professional and ethical responsibility and sensitivity to gender issues

Working independently

Criticism and self-criticism

Team work

Production of free, creative and inductive thinking

Working in an international environment

.....

*Working in an interdisciplinary environment*

*Others...*

*Production of new research ideas*

.....

- Team work
- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Decision-making
- Respect for the natural environment
- Project planning and management
- Production of free, creative and inductive thinking

### 3. SYLLABUS

#### **Week 1-2: Introduction to infrastructure systems and systems approach**

- **Overview of infrastructure systems and systems approach:**
  - Understanding the sources and components of infrastructure.
  - Introduction to different types of infrastructure (urban, industrial, agricultural).
- **Built environment (above and underground):**
- **Urban and regional planning for sustainable cities:**
  - Examination of local and international regulations governing infrastructure.
  - Introduction to environmental impact assessment methodologies.

#### **Week 3-5: Economic and Financial strategy for infrastructure systems**

- **Economy and Infrastructure:**
- **Financial strategy for infrastructure systems:**
  - Case studies on successful infrastructure systems in urban and rural settings.
- **The Price of Government: emphasis on current budget systems:**
  - Budget formulation.
  - Privatization of infrastructure.

#### **Week 6-7: Structural Asset management in infrastructure systems.**

#### **Week 7-8: Public works and utility structure and management**

- **Guest Lectures from Experts in Public Works:**
  - Invited experts sharing experiences in developing and implementing infrastructure management policies.
  - Q&A sessions with the experts.

#### **Week 9-10: Infrastructure security Risk and emergency management**

- **Infrastructure security Risks:**
  - Understanding the concept of Security.
  - Differentiating between Natural and Societal Risks.
- **Emergency management:**
  - Exploration of various applications such as agricultural, urban-industrial, and environmental.

#### **Week 11: Politics and social aspects of infrastructure**

- **Specifics of Infrastructure Policy**
- **Social issues in Infrastructure Management:**
- **Case Studies of Successful Infrastructure Management:**

**Week 12: Public sector economics, agricultural and industrial policy**

**Week 13: Emerging Trends**

- **Innovations in infrastructure Management:**
  - Exploration of cutting-edge technologies and innovations in the field.
- **Advances in Monitoring and Control Systems:**
  - Introduction to smart monitoring and control systems for efficient infrastructure management.
  - Case studies on successful implementation.
- **Future Prospects and Research Opportunities:**
  - Discussion on ongoing research and potential areas for future exploration.

**4. TEACHING and LEARNING METHODS - EVALUATION**

<p><b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i></p>	<p>Face-to-face &amp; distance learning</p> <ul style="list-style-type: none"> <li>• Lecture-Based Learning</li> <li>• E-Learning</li> <li>• Internships and Work-Study Programs</li> <li>• Field Trips</li> <li>• Guest Lectures</li> <li>• Group Projects</li> </ul>																			
<p><b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<ul style="list-style-type: none"> <li>• Basic software (windows, word, excel, power point, web, etc)</li> <li>• Aua webmail</li> <li>• AV material</li> <li>• Powerpoint slides</li> </ul>																			
<p><b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i></p> <p><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></p> <p><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></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #f2f2f2;"> <th style="text-align: center;"><i>Activity</i></th> <th style="text-align: center;"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td><i>Lectures</i></td> <td style="text-align: center;">24</td> </tr> <tr> <td><i>project, essay writing</i></td> <td style="text-align: center;">6</td> </tr> <tr> <td><i>Waste industry Guest lecturer</i></td> <td></td> </tr> <tr> <td><i>Field visits</i></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>		<i>Activity</i>	<i>Semester workload</i>	<i>Lectures</i>	24	<i>project, essay writing</i>	6	<i>Waste industry Guest lecturer</i>		<i>Field visits</i>									
<i>Activity</i>	<i>Semester workload</i>																			
<i>Lectures</i>	24																			
<i>project, essay writing</i>	6																			
<i>Waste industry Guest lecturer</i>																				
<i>Field visits</i>																				

	Course total	<b>30</b>	
<p style="text-align: center;"><b>STUDENT PERFORMANCE EVALUATION</b></p> <p><i>Description of the evaluation procedure</i></p> <p><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></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<ul style="list-style-type: none"> <li>• <b>Midterm Examination:</b>  Comprehensive test covering material from the first half of the course.</li> <li>• <b>Case Study Analysis:</b>  Individual or group analysis of a real-world case study related to waste and wastewater management.</li> <li>• <b>Final Examination:</b>  Cumulative test covering material from the entire course.</li> </ul>		

## 5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- **National Infrastructure Protection Plan. 2009.** Partnering to enhance protection and resiliency.. Homeland Security, W.D.C, USA.
- **Europe's Environment, 2015.** European Environment Agency, Copenhagen, Denmark..
- **Grigg, N.S., 1986-2017.** Infrastructure Management and Security. Class notes. Civil and Environmental Engineering Department, Colorado State University, Fort Collins, CO. U.S.A.

- Related academic journals:

- **Journal of Infrastructure Systems**, ASCE, Reston, V., USA.
- **Infrastructures**, MDPI, SW.
- **Journal of Infrastructure Policy and Management (JIPM)**, <https://doi.org/10.35166/jipm>