

COURSE OUTLINE

1. GENERAL

SCHOOL	Environment and Agricultural Engineering		
ACADEMIC UNIT	Department of Natural Resources Development & Agricultural Engineering		
LEVEL OF STUDIES	Master		
COURSE CODE	630011	SEMESTER	2 nd
COURSE TITLE	Environmental Contingency Planning		
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	
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>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised general knowledge		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (English)		
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/PMS61108/		

2. LEARNING OUTCOMES

<p>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></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>The course has the following objectives:</p> <ul style="list-style-type: none"> • To present an integrated framework of Planning and Forecasting in relation to engineering infrastructure and the environment in different time horizons. • To present methodologically the forecasting techniques for various options (impacts of actions and policies) and developing technological applications. Scientific forecasting techniques examined include: scanning, trend analysis, trend monitoring, trend projection, scenario development and analysis, polling, models, gaming, Delphi, etc. • To combine technical issues such as systems analysis and evaluation methodologies, with issues such as: decision making, legislative framework, environmental impacts, social environment, social and economic development, etc. • To emphasize the interdependence of technology and environment and the methodology of approaching them.
<p>General Competences <i>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?</i></p> <p><i>Search for, analysis and synthesis of data and information, Project planning and management</i></p>

with the use of the necessary technology
 Adapting to new situations
 Decision-making
 Working independently
 Team work
 Working in an international environment
 Working in an interdisciplinary environment
 Production of new research ideas

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 thinking

 Others...

- 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

PART 1. TECHNOLOGY ASSESSMENT FRAMEWORK

Week 1-2: General Introduction

- **Technology and Environment:**
 - Technology and technique
 - Environmental Impacts, Technology Assessment and Risk Assessment (Technology Management).
- **Impact Assessment and Forecasting:**
 - Impacts and Society
 - The Assessment as a Forecasting Process
- **Technology Assessment -Environmental Planning:**
 - Definitions and characteristics of Technology Assessment.
 - Technology Assessment: History and Legislation.

Week 3-4: Planning

- General definitions.
- Purpose of contingency planning.
- Planning and Policy analysis.
- Planning methodology.
- Planning parameters and limitations.
- Planning applications. Planning and decision-making.

PART 2. STRATEGIES AND TACTICS

Week 5: Technological change and the Art of conjecture.

- Prediction and anticipatory planning
- The hazards of Assessment and prediction
- The epistemology of forecasting.

Exercise 1

Week 6: Developing an Assessment matrix

- Classifying Approaches to assessments methods.
- Overview of forecasting methodologies.
- Problem solving postures.

Week 7: Consensus Methodologies

- Brainwriting.
- Nominal Group Technique (NGT).
- Delphi.
- Interpretive Structural Modeling-ISM).
- Options Field Method.
- Issues management.

Exercise 2

Week 8: Monitoring Trends and Environmental Scanning

- The meaning of trend extrapolation

- Types of extrapolation and prognostication.
- Monitoring.
- Breakthroughs.
- Trend correlation analysis.

Week 9: Modeling and Decision Support Systems (DSS)

- Linear-structural modeling
- Simulation, optimization and gaming
- Dynamic Modeling.
- Cross Impact Analysis.

Week 10: Scenarios and Normative methods

- **Scenarios:**
 - Types and uses of Scenarios
 - Alternative Futures
- **Normative Methods : the teleological Perspective**
 - Normative Graphics
 - Networks

PART 3. DECISION MAKING AND IMPLEMENTATION.

Week 11: Risk and Decision making

- **Risk analysis and the Management of Uncertainty**
 - The risk components.
 - Risk perception.
 - Risk assessment Methods
 - Risk Analysis, Assessment and Management.
 - Acceptable and assumable Risks
- **Decision Support Systems Implementation**
 - Judgment and Decision Making.
 - Decision Making Process.
 - Rationality, Reasonableness and Prudence

Week 12: Strategic Planning, Prognostics and Complex Systems Management

- **Strategic Planning and Prognostics**
 - Pitfalls and features of Assessment and Forecasting.
 - Predictions and Contingency Planning.
 - From Crisis to Risk Management
- **Complex Systems Management**
 - The challenge of macro engineering.
 - Interdisciplinary teams and multi-objective emphasis.

PART 4. COPING WITH TECHNOLOGY AND THE FUTURE

Week 13: Emerging Contexts

- **Future Environments:**
 - Science, Technology and National Goals.
- **The Future: of the Future**
 - Visionary forecasts and alternative futures.
 - Designing the future.

FINAL PRESENTATION-EXAM

4. TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	<p>Face-to-face & distance learning</p> <ul style="list-style-type: none"> ● Lecture-Based Learning ● E-Learning ● Internships and Work-Study Programs ● Field Trips and Guest Lectures ● Projects 																								
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<ul style="list-style-type: none"> ● Basic software (word, excel, power point, web, etc) ● AUA webmail ● AV material, PowerPoint slides 																								
<p style="text-align: center;">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></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> <th style="text-align: center;">Activity</th> <th style="text-align: center;">Semester workload</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">24</td> </tr> <tr> <td>project, essay writing</td> <td style="text-align: center;">6</td> </tr> <tr> <td>Waste industry Guest lecturer</td> <td></td> </tr> <tr> <td>Field visits</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> <tr> <td> </td> <td></td> </tr> <tr> <td> </td> <td></td> </tr> <tr> <td>Course total</td> <td style="text-align: center;">30</td> </tr> </tbody> </table>	Activity	Semester workload	Lectures	24	project, essay writing	6	Waste industry Guest lecturer		Field visits														Course total	30
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<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION <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"> ● Midterm Homework: Comprehensive two homework sets covering material from the course. ● Case Study Analysis: Individual analysis of a real-world case study related to the course material. ● Final Examination: Oral pptx individual class presentation and written corresponding report on the course material and the case study analysis. 																								

5. ATTACHED BIBLIOGRAPHY

<p>- Suggested bibliography:</p> <ul style="list-style-type: none"> ● Decleris, M., 2000. <i>The Law of Sustainable Development.</i> European Commission, Environment Directorate – General, Brussels. ● Europe's Environment, 2015. European Environment Agency, Copenhagen. ● Flyvbjerg, B., Bruzelius, N. and W. Rothengatter, 2003. <i>Megaprojects and Risk,</i> Cambridge University Press, Cambridge, UK. ● Lippincott, K., Umberto Eco and Gombrich E.H., 2000. <i>The Story of Time.</i> Merrel Holberton Publishers, London, U.K. ● Scaer, R., Claey's G. and Tower Sargent L., 2000. <i>Utopia.</i> New York Public Library and Oxford University Press, N.Y., N.Y. ● Therivel, R., 2004. <i>Strategic Environmental Assessment in Action.</i> Cromwell Press Ltd. Gateshead, UK. ● Vlachos. E.C., 1986-2005. <i>Technology Assessment and Social Forecasting.</i> Class notes. Civil Engineering Department, Colorado State University, Fort Collins, CO. U.S.A..- <p>Related academic journals:</p> <ul style="list-style-type: none"> ● Journal of Forecasting, Wiley Research ● Forecasting, EISSN 2571-9394, Published by MDPI. ● Technological Forecasting and Social Change. Elsevier Publishing. ● International Journal of Forecasting Elsevier Publishing
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