

COURSE OUTLINE

(1) GENERAL

SCHOOL:	Engineering		
DEPARTMENT:	Electrical and Computer Engineering		
LEVEL OF STUDY:	Undergraduate		
COURSE UNIT CODE:	5.005	SEMESTER	5 th
COURSE TITLE:	ENERGY SYSTEMS		
COURSEWORK BREAKDOWN		TEACHING WEEKLY HOURS	ECTS Credits
Theory (Lectures) and Exercises		4	4
TOTAL		4	4
COURSE UNIT TYPE:	General knowledge		
PREREQUISITES:	None		
LANGUAGE OF INSTRUCTION/EXAMS:	Greek		
COURSE DELIVERED TO ERASMUS STUDENTS	No		
COURSE WEB PAGE (URL)	https://eclass.hmu.gr/courses/ECE154/		

(2) LEARNING OUTCOMES

Learning Outcomes
<p>The aim of the course is the understanding by the student topics related to Renewable Energy Sources (RES) and in particular with photovoltaic systems, solar thermal systems, wind turbines, biomass units and hydroelectric installations as well as conventional energy production systems.</p> <p>In particular, the student will be able to</p> <ul style="list-style-type: none"> • to process elements of the solar and wind potential of a place • calculate energy production from solar and wind systems • understand how Renewable Energy systems operate • analyze the basic characteristics of RES systems • recognize the basic principles of technologies used in Power Generation • understand heat generation and storage systems operation
General Skills
<p>The course aims to allow the student to acquaint the following general skills:</p> <ul style="list-style-type: none"> • Retrieve, analyse and synthesise data and information, with the use of necessary technologies • Autonomous work • Cross disciplinary collaboration • Develop new research ideas • Promoting liberal, creative and inductive/deductive thinking

(3) SYLLABUS

<p>The course includes the following topics:</p> <ul style="list-style-type: none"> • Solar geometry (equivalent motion of the Sun, seasons, solar noon, angle of incidence) • Solar and Wind potential • Energy production from PV and Wind systems • Geothermal, high and low enthalpy geothermal energy • Solar thermal systems for buildings heating and hot water production • Solar thermal systems for electricity energy production • Biomass (introduction, prospects, technologies)
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- Hydroelectric (introduction, prospects, technologies)

(4) TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	In-Class Face-to-Face												
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	<ul style="list-style-type: none"> • Use of ICTs in lecturing • Use of ICTs for the communication with students via the e-class platform 												
TEACHING ORGANIZATION	<table border="1"> <thead> <tr> <th><i>Method description/Activity</i></th> <th><i>Semester Workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>65</td> </tr> <tr> <td>Self-study</td> <td>55</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Total Contact Hours</td> <td>120</td> </tr> </tbody> </table>	<i>Method description/Activity</i>	<i>Semester Workload</i>	Lectures	65	Self-study	55					Total Contact Hours	120
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ASSESSMENT METHODS	<p>Assessment Language: Greek</p> <p>All announcements for the course regulations and complementary reading material are posted in the course web page. The course grade incorporates the following evaluation procedures:</p> <p>Description</p> <ul style="list-style-type: none"> ➤ Written test (100%) <ul style="list-style-type: none"> a. Problem solving b. Multiple choice question 												

(5) RECOMMENDED BIBLIOGRAPHY

-Recommended Bibliography:

Ασημακόπουλος Δ., Αραμπατζής Γ., Αγγελής - Δημάκης Α., Καρταλίδης Α., Τσιλιγκιρίδης Γ., Ανανεώσιμες Πηγές Ενέργειας, Εκδότης Σοφία Ανώνυμη Εκδοτική & Εμπορική Εταιρεία, Θεσσαλονίκη, ISBN: 978-960-6706-76-9, Κωδικός Βιβλίου στον Εύδοξο: 41963205

Relevant scientific journals:

- (1) *Solar Energy*
- (2) *Wind Energy*
- (3) *Progress in Photovoltaics: Research and Applications*
- (4) *IEEE Journal of Photovoltaics*
- (5) *Energies*
- (6) *Biomass & Bioenergy*