COURSE OUTLINE

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	8.029	**SEMESTER OF STUDY**	8th
COURSE TITLE	Electromagnetic Compatibility		

COURSEWORK BREAKDOWN	**TEACHING WEEKLY HOURS**	**ECTS Credits**
Theory (Lectures)	3	2
Tutorial/Project	1	1
Laboratory	1	1
TOTAL	**5**	**4**

COURSE UNIT TYPE	Deepening / Consolidation of specialty knowledge
PREREQUISITES	Basic knowledge and skills from the courses: Electromagnetic Field I (4th semester) Electromagnetic Field II (5th semester) Antennas and Propagation of Electromagnetic Radiation (7th semester)
LANGUAGE OF INSTRUCTION/EXAMS	Greek
COURSE DELIVERED TO ERASMUS STUDENTS	No
WEB PAGE (URL)	https://eclass.hmu.gr/courses/ECE170/

(2) LEARNING OUTCOMES

Learning Outcomes

Nowadays, electromagnetic disturbances can catalyze the operation of a circuit or system and reduce its efficient operation. On the other hand any operating circuit or system can catalyze the operation of other circuits that can be electromagnetically coupled to it. Therefore, the study of electromagnetic compatibility phenomena and electromagnetic shielding mechanisms is the subject of extensive research in modern times.
The course aims to familiarize the student with fundamental concepts, definitions, specifications and standards of electromagnetic compatibility, electromagnetic interference and electromagnetic shielding problems.

Upon successful completion of the course the student will be able to:

1. Understand the basic principles of electromagnetic compatibility
2. Recognizes and explains electromagnetic compatibility standards
3. Acquire specialized knowledge to be able to analyze and interpret problems of electromagnetic compatibility and electromagnetic interference
4. Suggests solutions for electromagnetic shielding
5. Can operate / program specialized instruments for measuring electromagnetic fields and electromagnetic interference to evaluate corresponding problems of electromagnetic effects.

General Skills

- Search, analysis and synthesis of data and information, using the necessary technologies
- Adapt to new situations
- Decision making
- Autonomous work
- Working in an international environment
- Work in an interdisciplinary environment
- Generation of new research ideas

(3) SYLLABUS

Theoretical Lecture Units

• Basic concepts and definitions of electromagnetic compatibility,
• Electromagnetic compatibility specifications,
• Electromagnetic interference,
• Analysis of electromagnetic interference,
• Electromagnetic coupling,
• Electromagnetic shielding and immunity,
• Electromagnetic shielding systems,
• Instructions standards and carriers of electromagnetic compatibility,
• Antenna theory for electromagnetic compatibility,
• Electromagnetic compatibility fields and CE marking,
• Electromagnetic compatibility measurement procedures and practical applications.

Laboratory exercises

Exercises using spectrum analyzers and electromagnetic interference analyzers:

1. Measurements of electromagnetic fields,
2. Measurements of electromagnetic interference,
3. Methods for solving problems of electromagnetic interference and shielding.

(4) TEACHING METHODS - ASSESSMENT

<table>
<tr><td>MODE OF DELIVERY</td><td>In-Class Face-to-Face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</td><td>• Use of ICTs in lecturing
• Use of ICTs in laboratory-based training
• Use of ICTs for the communication with students via the e-class platform</td></tr>
<tr><td>TEACHING ORGANISATION</td><td>
<table>
<tr><th>Method description / Activity</th><th>Semester Workload</th></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Laboratory</td><td>13</td></tr>
<tr><td>Bibliography study & analysis</td><td>26</td></tr>
<tr><td>Tutorials</td><td>13</td></tr>
<tr><td>Writing assignments</td><td>13</td></tr>
<tr><td>Non-guided personal study</td><td>16</td></tr>
<tr><td>Total Contact Hours</td><td>120</td></tr>
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</td></tr>
<tr><td>ASSESSMENT METHODS</td><td>Language of Assessment: Greek

Student Assessment methods: Written examination with problem solving (formative, concluding)

Final written examination in the whole material (70%). The exam includes theory questions (from 2 to 4) and practice exercises (from 2 to 4).
Laboratory exercises - reports and laboratory test - (30%)

The evaluation criteria are announced to the students at the beginning of the semester and are posted on the course website in eClass.</td></tr>
</table>

(5) RECOMMENDED BIBLIOGRAPHY

- Recommended Bibliography:

- *Χ. Καψάλης, Π. Τρακάδας, Ηλεκτρομαγνητική Συμβατότητα (EMC), Εκδόσεις Τζιόλα, 2006 (ISBN: 960-418-093-2).*
- *P. Chatterton and M. Houlden, Ηλεκτρομαγνητική Συμβατότητα (EMC), Εκδόσεις Τζιόλα, 2000 (ISBN: 960-8050-38-3).*
- *Clayton. R. Paul, Introduction to Electromagnetic Compatibility, 2nd edition, John Wiley & Sons, Inc., 2006.*

- Relevant Scientific Journals:

- *IEEE Electromagnetic Compatibility Magazine*
- *IEEE Transactions on Electromagnetic Compatibility*
- *IEEE journal on electromagnetic compatibility practice and applications*

- IEEE Letters on Electromagnetic Compatibility Practice and Applications