

COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING		
ACADEMIC UNIT	Department of Electrical and Electronics Engineering		
LEVEL OF STUDIES	Graduate (MSc)		
COURSE CODE	A.01	SEMESTER	01
COURSE TITLE	RESEARCH METHODOLOGY & SCIENTIFIC WRITING		
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		3	6
Lab		0	
Total		3	
<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>	Postgraduate skills development		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek and English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><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>This course module primarily aims at student skills development at the graduate level, on the issues of (a) research methodology and (b) scientific writing.</p> <p>Upon successful completion of the course, students are expected to be able to:</p> <ol style="list-style-type: none"> 1. Understand and explain the difference between research and development, 2. Appreciate the role of English language mastery in order to write scientific texts in Science and Engineering, 3. Understand and correctly apply basic quantitative and qualitative research methods, 4. Understand, and adopt research ethics, proper citation and plagiarism avoidance, 5. Perform bibliographic search and retrieval of pertinent information, 6. Understand and explain how research is carried out and how it is connected to the presentation of results in the form of an article, 7. Construct and organize correctly a typical scientific article,

8. Develop correctly the parts of a scientific article,
9. Put together sound argumentation and produce accurate citation and referencing,
10. Author / compose and correctly format the content, references etc. of a scientific article,
11. Understand and correctly apply the scientific article submission process and the review process,
12. Evaluate and review scientific articles and compose / author paper review reports,
13. To compose / author responses to reviewers.

Keywords: Research Methodology, Research Ethics, Scientific Writing, Scientific Articles, Literature Search, Scientific Journals and Conferences.

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?

<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Production of new research ideas</i>	<i>Others...</i>
	<i>.....</i>

- Search, analysis and synthesis of data and information, using the necessary technologies.
- Adaptation to new situations.
- Decision making.
- Autonomous work.
- Teamwork.
- Work in an interdisciplinary environment.
- Promoting free, creative and inductive thinking.
- Conduction of research.
- Presentation of research results in the form of a scientific article.

(3) SYLLABUS

The contents of the module are outlined as follows:

1. Introduction to research terminology, basic and applied research, research design and implementation issues, support – explanatory material development, publication and dissemination of research results.
2. Quantitative and qualitative research methods overview.
3. Research ethics, intellectual property rights, avoidance of plagiarism.
4. International scope of research results publication (journals, conferences, workshops), prestige and renown of publication sources and means, access to published material (membership / open-access), publication review process and publications management.
5. Bibliographic databases, search and retrieval of information through modern web tools.
6. Formal referencing and citation styles (Chicago, Harvard, APA, etc.).
7. Scientific text authoring (reports, articles, abstracts, presentations). Structure, contents, formatting, terminology, use of language and expression. Practice on examples from the field of Electrical and Electronics Engineering.
8. Software tools (text editors, such as LaTeX, etc.) for scientific text preparation and formatting (text, tables, mathematical formulas, etc.). Collaborative editing, versioning and commenting methods and tools.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Synchronous distance learning (e-learning)	
<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"> - Support of the learning process using power point presentations - Electronic communication with students - Support of the learning process through the Open eClass electronic platform 	
<p style="text-align: center;">TEACHING METHODS</p> <p><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>	Activity	Semester workload
	Lecture attendance	40
	Study of theory, lectures and literature	40
	Unguided literature study, solving exercises and preparing a final course examination.	36
	Writing a scientific article, review a scientific article.	64
Course total	180	
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</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>	<p>The final grade is composed of 3 parts:</p> <ul style="list-style-type: none"> (a) sample regular paper or short review paper write-up (student is free to select paper subject; supervisor consent is required; the subject is usually related to the student's research project topic) x 60%, (b) the presentation of this paper in class x 20%, (c) the review of the paper written by a classmate x 20%. <p>Grading criteria for (a):</p> <ul style="list-style-type: none"> • Paper structure, • Understanding and critical assessment of existing research, • Sound documentation of and argumentation on the proposed research results, • Correct formatting and referencing. <p>Grading criteria for (b):</p> <ul style="list-style-type: none"> • Presentation structure, • Content formatting, • Fluency in presentation and ability to answer questions on it. <p>Grading criteria for (c):</p> <ul style="list-style-type: none"> • Review structure, • Control points as in (a) and (b) above, used as review criteria, • Expression, language and style of the review. 	

(5) ATTACHED BIBLIOGRAPHY

<p>BIBLIOGRAPHY</p> <ol style="list-style-type: none"> 1. Research Methodology and Scientific Writing, C. George Thomas, Second Edition, 2021, Springer Cham, ISBN: 978-3-030-64864-0, DOI: https://doi.org/10.1007/978-3-030-64865-7. 2. Writing for Science and Engineering, Heather Silyn-Roberts, Second Edition, 2013, Elsevier, ISBN: 978-0-08-098285-4, DOI: https://doi.org/10.1016/C2011-0-07858-4. 3. Scientific Papers and Presentations, Martha Davis, Kaaron J. Davis and Marion M. Dunagan, Third Edition, 2013, Elsevier, ISBN: 978-0-12-384727-0, DOI: https://doi.org/10.1016/C2009-0-64256-2. 4. Scientific Papers and Presentations, by Martha Davis. Academic press, 1997 5. Publications Handbook and Style Manual, Chapter 5. Tables and Figures, ASA–CSSA–SSSA, 5585

Guilford Rd., Madison, WI 53711, USA.

RESEARCH ARTICLES

6. S. R. N. Reis and A. I. Reis, "How to write your first scientific paper," 2013 3rd Interdisciplinary Engineering Design Education Conference, Santa Clara, CA, USA, 2013, pp. 181-186, DOI: <https://doi.org/10.1109/IEDEC.2013.6526784>.
7. C. A. Linte, "Tips on Scientific Writing and Manuscript Preparation [Continuing Education]," in IEEE Pulse, vol. 5, no. 6, pp. 58-60, Nov.-Dec. 2014, DOI: <https://doi.org/10.1109/10.1109/MPUL.2014.2355322>.
8. J. A. Longo, Preparing a Research Paper in IEEE Format, on-line available: https://www.unlv.edu/sites/default/files/page_files/27/Engineering-PreparingPaperIEEE-Sept15.pdf (last access: 8/2/23).
9. J. Gain, Research Methods: Technical Writing, on-line available: <https://slideplayer.com/slide/4401286/> (last access: 8/2/23).
10. K. Sainani, Scientific Writing, on-line available: <https://web.stanford.edu/~kcobb/courses/writing/> (last access: 8/2/23).
11. Measuring Your Impact: Impact Factor, Citation Analysis, and other Metrics: Journal Impact Factor (IF), University Library, on-line available: <https://researchguides.uic.edu/if/impact> (last access: 8/2/23).

TOOLS

- LaTeX: <https://www.latex-project.org/>

WEBSITES

- <https://dl.sciencesocieties.org/publications/style>
- <http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtoc.html>
- <https://www.springer.com/gp/authors-editors/authorandreviewertutorials/writing-a-journal-manuscript/figures-and-tables/10285530>
- <https://www.elsevier.com/connect/11-steps-to-structuring-a-science-paper-editors-will-take-seriously#step1>