

COURSE OUTLINE

DIPLOMA DISSERTATION

(1) GENERAL

SCHOOL	School of Engineering		
DEPARTMENT	Mechanical Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΠΤΥΧ	SEMESTER	10 ^ο
COURSE TITLE	Diploma Dissertation		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS CREDITS
Project			30
COURSE TYPE	Skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek or English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://www.mie.uth.gr/?page_id=23471&lang=en		

(2) LEARNING OUTCOMES

Learning Outcomes

The Diploma Thesis constitutes an independent scientific and systematic approach to the analysis of a subject and the formulation of a solution, drawing upon existing literature and/or research. The Diploma Thesis may have a research-oriented, theoretical, developmental, or applied research character.

Under the guidance of the supervising faculty member, students are given the opportunity to gain significant experience through the comprehensive study and in-depth investigation of a specific subject within their specialization. They are expected to develop skills in critical and integrative thinking, organization, and analysis, by applying a rigorous, systematic, and scientific methodology.

Upon successful completion of the Diploma Thesis, the student will be able to:

- Clearly identify the boundaries of a problem to be addressed and fully recognize both its primary and secondary aspects, focusing on the most essential elements for its resolution.
- Describe and substantiate the fundamental knowledge related to the subject of the undertaken research.
- Summarize the existing scientific knowledge and technical expertise relevant to the topic.

At the Skills Level:

- Critically and synthetically utilize the available literature within a specific thematic area.
- Design a research plan and develop an appropriate methodology for approaching and investigating the subject under study, and organize an implementation framework.
- Design, simulate, and/or construct original material/software relevant to the selected solution.
- Compose a comprehensive scientific/technical paper.
- Communicate findings clearly and effectively, including the knowledge and reasoning that underpin them, through a successful presentation before the three-member examination committee.

At the Competence Level:

- Integrate knowledge and apply technical expertise to solve complex application problems or address new issues within a broader or interdisciplinary context relevant to the field of Mechanical Engineering.
- Select appropriate techniques/approaches and adapt them to the problem at hand by employing original thinking.
- Evaluate the proposed approach/solution within a comparative framework against similar methods found in Greek and international literature, and comment on its relative advantages and disadvantages, substantiating their opinions and choices.
- Analyze results and draw conclusions.

General Competences

- Search, analysis, and synthesis of data and information using the necessary technologies
- Independent work
- Decision-making
- Exercising critical thinking and self-assessment
- Advancement of free, creative, and inductive thinking
- Project planning and management
- Working in an interdisciplinary environment
- Generation of new research ideas

(3) SYLLABUS

Diploma theses cover a broad spectrum of subject areas within the field of Mechanical Engineering and serve a dual purpose: firstly, to introduce the student to high-level research and study-oriented activities, and secondly, to provide the opportunity—should the student wish—to develop research skills.

The Department has developed a Diploma Thesis Preparation Guide, which outlines the procedures for the assignment, execution, and evaluation of the Diploma Thesis, thereby ensuring the academic quality and credibility of the entire process. Additionally, the opportunity exists for thesis topics to be jointly defined in collaboration with industrial entities, allowing the student to carry out part of the work within the industry, with a focus on applied industrial research. In this way, practical training is combined with a high level of scientific work.

The progress of the thesis is monitored at regular intervals in collaboration with the supervising faculty member, and toward the end of the process, with the three-member Examination Committee.

The Diploma Thesis must include a series of activities spanning all phases of the process, which collectively ensure the successful outcome of the project in every respect. The results of these activities are summarized in the written document, which may include the following sections:

- Rationale for Project Execution
- Comprehensive Literature Review
- Description of the Experimental or Computational Procedure and Methodology
- Presentation and Discussion of Results
- Conclusions and Suggestions for Future Work

The Diploma Thesis must also include all supporting materials that substantiate the results in the form of appendices, such as tables, diagrams, photographs, etc. Furthermore, it must contain an abstract in both Greek and English for documentation purposes in the Technical Chamber of Greece (TEE) Information Database.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY METHOD	Face to face in combination with distance learning methods.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none"> • Use of ICT in teaching, research activities, and communication with students (supporting the learning process through a course website, searching for bibliographic sources online, communication via e-mail, submission of assignments and exercises). • Mandatory use of the e-class platform for all the above-mentioned purposes. • Use of ICT in both the educational and research process (specialized software such as computational fluid dynamics, CAD tools, stress and strain analysis software, etc.). 	
TEACHING METHODS	Activity	Semester Workload
	Study and Analysis of Literature	100
	Thesis Development, including: analysis, design, programming, simulation, construction, evaluation, etc.	500
	Thesis Writing and Presentation Preparation	150
Course Total	750	
STUDENT PERFORMANCE EVALUATION	<p>Written Thesis (100%)</p> <ul style="list-style-type: none"> • Submission of a detailed technical report documenting the conducted research/implementation and its results. • The final examination includes responses to a set of theoretical questions, as well as comprehensive questions covering the full scope of the thesis. • Presentation of the Diploma Thesis. • The evaluation of the Diploma Thesis is carried out by a three-member Examination Committee composed of faculty members from the Department whose academic expertise is relevant to the subject of the thesis. The Committee may be supplemented by faculty members or scientific collaborators from another Department of the same or a different Higher Education Institution, provided they have relevant expertise. • Upon completion of the examination process, the Committee convenes to determine the final grade. Each member of the Examination Committee assigns a separate grade for the Diploma Thesis. The final thesis grade is the average of the individual grades assigned by the members of the Committee. <p>In grading, each committee member takes into consideration the following criteria:</p> <ul style="list-style-type: none"> • The originality of the topic and its degree of difficulty • The student's understanding of the subject • The methodology applied in investigating the topic • The implementation • The presentation • The technical quality of the written thesis • The degree to which the thesis objectives were achieved 	

(5) RECOMMENDED BIBLIOGRAPHY

- Recommended bibliography:

N. J. Higham. Handbook of Writing for the Mathematical Sciences, 3rd Edition, SIAM, 2020.

The supervising faculty member suggests additional bibliography depending on the subject of the thesis

- Related Academic Journals: