COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Mechanical Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	MY2702	**SEMESTER**	8th
COURSE TITLE	Technology of Machining Processes		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and practice exercises	5	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	Special background
PREREQUISITE COURSES:	There are no prerequisite courses. It is recommended that students who are interested in attending the course have completed successfully the following course: Introduction to Manufacturing Processes.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://www.mie.uth.gr/?page_id=18435&lang=en

(2) LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The aim of the course is to systematically investigate the geometric and kinematic variants of a wide range of machining processes and related machine tools to optimize the machining system. Upon successful completion of the course students will be able to:

- Analyze, describe and scientifically and technologically optimize metal material cutting processes.
- Design and specify the parameters of Cutting Machines in accordance with modern cutting technologies and machine tools.
- Solve problems related to modern technological trends in the scientific field of cutting processes.

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?

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

- Search, analyze and synthesize data and information using the necessary technologies
- Independent Work
- Decision making
- Project planning and management
- Exercising criticism and self-criticism
- Promote free, creative and inductive thinking

(3) SYLLABUS

Analysis and design of machining operations with defined cutting edge geometry (turning, drilling, milling, planning, gear cutting, grooving). Analysis and design of machining operations with non-defined cutting edge geometry (grinding, honing, lapping, over-grinding). Machines for metal working (spectrum, subsystems, static and dynamic robustness, geometric precision). Vibration and Chatter in Machining Operations. Highspeed Machining. Hard Machining, Ultraprecision Machining. Machining Economics. Micro-cutting. Conventional Micro-machining operations. Abrasive Micro-machining Modern micro-computer technologies. Cutting with digital guidance machines (CNCs), Types of Machining Centers. Characteristics and Capabilities of Machining, Selection of Machining Centers. Methods of research and simulation of cutting technologies.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY ***Face-to-face, Distance learning, etc.***	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in teaching
TEACHING METHODS *The manner and methods of teaching are described in detail. 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.* *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*	

Activity	*Semester workload*
Lectures	56
Educational visits	4
Study and analysis of bibliography	40
Independent study	50
Course Total (25 hours of work per credit unit)	**150**

STUDENT PERFORMANCE EVALUATION ***Description of the evaluation procedure*** *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* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Final written examination (closed book)

(5) ATTACHED BIBLIOGRAPHY

Suggested bibliography:

- Kalpakjian S., Schmid S.R., Manufacturing Engineering and Technology, Pearson 2023.
- Davim P.J., Modern Machining Technology: A Practical Guide, Woodhead Publishing 2011.
- Grzesik W., Advanced machining processes of metallic material: Theory, modelling and applications, Elsevier 2016.
- El Hofy H. A., Fundamentals of Machining Processes: Conventional and Nonconventional Processes. Taylor & Francis Group, 2014

Related academic journals:

- Machining Science and Technology
- CIRP Journal of Manufacturing Science and Technology
- CIRP Annals - Manufacturing Technology