COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Financial and Management Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	MH0106	SEMESTER	4th
COURSE TITLE	Chemical Technology		

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**
	3	4.5
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, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	

(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*

Main purpose of this course is to introduce students to issues such as unit systems, mass and energy balances, calculations in chemical technology, fluid flow, heat transfer, processing and use of water in the chemical industry, hygiene and safety in the chemical industry. After successful completing the course, students will be expected to be able to:

- Understand the basic principles of physical and chemical processes used in the production process as well as the rules that govern
- Understand processes such as catalysis, adsorption, precipitation and filtration

- Resolve application exercises in various systems of physical-chemical processes of industrial instrument
- Evaluate the efficiency of processes
- Understand the anti-pollution technology
- Understand issues regarding water technology

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 for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Project planning and management
Respect for the natural environment
Criticism and self-criticism

(3) SYLLABUS

There will be analysis of physical and chemical processes that occur in the production of goods and the understanding of the basic rules and principles that govern these processes. Particular attention is paid to certain processes, catalysis, adsorption, sedimentation and filtration. Examples and exercises of application in various industrial systems are given for the better understanding of the chemical and natural processes. Special topics on water technology are also presented.

Module Contents (Syllabus):

Introduction to Technical Calculations
Basic definitions
Mass Balances
Energy Balances
Chemical Equilibrium
Intermediate Examination
Chemical Kinetic
Physicochemical Processes
Heterogeneous Processes Catalysis
Drinking water and wastewater technology
Adsorption
Precipitation
Filtration

(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*	
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.*	Intermediateand final examinations at the end of the semester, which include questions (development), knowledge and understanding of the content of the course, and problem solving.

Activity	***Semester workload***
Lectures	39
Study and analysis of bibliography	98
Intermediate examination	3
Examinations	3
Course total	143

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Βασικές Αρχές και Υπολογισμοί στη Χημική Μηχανική (D. M. Himmelblau, J.B. Riggs, 2006)

Εισαγωγή στη Χημική Τεχνολογία (Ζαμπούλης, Δ., Ζουμπούλης Α., Μάτης Κ., Μαύρος, Π., 2009)

Χημική Τεχνολογία (Ζαμπούλης, Δ., Ζουμπούλης Α., Καραπάντσιος Θ., Μάτης Κ., Τριανταφυλλίδης Κ., 2013)

Βασικές Αρχές και Υπολογισμοί στη Χημική Μηχανική (D. M. Himmelblau, J.B. Riggs, 2017)

Μηχανική Χημικών Διεργασιών (J. M. Smith, 1997)

Notes

AdditionalReferences:

Περιβαλλοντική Μηχανική Ι - Διαχείριση Υδατικών Πόρων (Θ. Λέκκας, 1996)

Χημική Ισορροπία (Σ. Ι. Καρέκου, 1997)

- Related academic journals:

Journal of Chemical Technology and Biotechnology

Chemical Engineering Journal