COURSE OUTLINE

(1) OVERVIEW

SCHOOL	MARITIME & INDUSTRY		
DEPARTMENT	INDUSTRIAL MANAGEMENT & TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	TETEX04	SEMESTER	4
COURSE TITLE	BIOTECHNOLOGY		

DISCRETE TEACHING ACTIVITIES *In cases where ECTS credits are awarded to distinct components of the course (e.g., Lectures, Laboratory Exercises, etc.), please indicate them separately. If the credits are awarded as a whole for the entire course, please state the weekly teaching hours and the total number of credits*	WEEKLY TEACHING HOURS	ECTS
Lectures	4	5.5
Please add additional rows if needed. A detailed description of the teaching organization and instructional methods is provided in Section (4).		

COURSE TYPE *core (C), core elective (CE), elective (E) - background, specialization, skill development*	E - Specialization
PREREQUISITE COURSES:	None.
LANGUAGE OF TEACHING AND EXAMINATIONS:	Greek (English for ERASMUS students)
THIS COURSE IS AVAILABLE TO ERASMUS STUDENTS	Yes
COURSE WEBPAGE (URL)	

(2) LEARNING OUTCOMES

Learning Outcomes

The learning outcomes of the course are described, specifying the particular knowledge, skills, and competencies at the appropriate level that students will acquire upon successful completion of the course.

Please refer to Appendix A

- *Description of the Level of Learning Outcomes for each study cycle according to the Qualifications Framework of the European Higher Education Area.*
- *Descriptive Indicators of Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B.*
- *Concise Guide for Writing Learning Outcomes*

This course explores the rapidly evolving field of biotechnology, focusing on both its scientific foundations and modern technological applications. Particular emphasis is placed on industrial and environmental biotechnology, as well as the societal impacts of biotechnological advancements. Through the study of innovative products and processes, the course highlights the interplay between science and technology and their role in driving economic and social development.

The course also addresses critical issues such as bioethics, biosafety, and policy governance. Special focus is given to cutting-edge areas such as biomimicry, blue biotechnology, and applications in habitat restoration—emphasizing biotechnology's role as a catalyst for green and sustainable development.

Upon successful completion of the course, students will be able to:

- Understand the contribution of modern biotechnology to scientific and technological progress.
- Identify commercial applications and innovative products resulting from biotechnological research across various sectors (health, environment, agri-food, industry).
- Explain the principles of biomimicry and their relevance to the design of new technologies.
- Analyze applications of blue biotechnology and the potential it offers in harnessing marine biological resources.
- Apply biotechnological principles to habitat restoration and environmental resilience.
- Analyze bioethical, biosafety, and regulatory issues related to the production and application of biotechnological products.
- Identify and assess the challenges of biotechnology commercialization, balancing innovation with investment risk.

General Competences

Taking into account the general competences that a graduate should have acquired (as listed in the Diploma Supplement and outlined below), which of

these competences does the course aim to develop?	
Searching, analyzing, and synthesizing data and information, using the necessary technologies *Adaptation to new situations* *Decision making* *Autonomous work* *Teamwork* *Working in an international environment* *Working in an interdisciplinary environment* *Generation of new research ideas*	*Project design and management* *Respect for diversity and multiculturalism* *Respect for the natural environment* *Demonstration of social, professional, and ethical responsibility and sensitivity to gender issues* *Exercising critical and self-critical thinking* *Promotion of free, creative, and inductive thinking* *…* *Other competences: …*

- Searching, analyzing, and synthesizing data and information, using the necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous work
- Teamwork
- Respect for diversity and multiculturalism
- Respect for the natural environment
- Demonstration of social, professional, and ethical responsibility and sensitivity to gender issues
- Exercising critical and self-critical thinking
- Promotion of free, creative, and inductive thinking

(3) COURSE CONTENT

The course covers the following topics:

Week	Topics
1	The biotechnology industry
2	The biotechnology domain
3-4	Biomimicry and technology
5	Applications of biotechnology in healthcare
6-7	Applications of biotechnology in the agri-food domain
8	Blue biotechnology
9-10	Applications of biotechnology in ecosystem restoration
11	Bioethics
12-13	Revision. Project presentation.

The course includes lectures, independent study, individual and group assignments of limited scope, participation in experiential activities, case studies, presentations, as well as other educational activities that promote active learning and the development of critical thinking. Furthermore, articles, audiovisual lecture material, web links to useful resources, exercises, and software are uploaded in electronic format on the eClass platform.

(4) TEACHING and LEARNING METHODS - ASSESSMENT

TEACHING MODE *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	• Face-to-face in a classroom • Distance teaching & learning (if required)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in Teaching, Laboratory Education, Communication with students*	**Teaching**: Lectures using modern audiovisual equipment, learning support through the eClass electronic platform, synchronous distance teaching via MS Teams. **Communication with students**: face-to-face during office hours, email, eClass platform, MS Teams tools
Organization of Teaching *A detailed description of the teaching methods and approach is provided.*	

Activity	Semester Workload
Lectures	52
Projects	26

Lectures, seminars, laboratory exercises, fieldwork, study and analysis of literature, tutorials, internships (placements), clinical practice, artistic workshops, interactive teaching, educational visits, project work, writing assignments, artistic creation, etc. *The student's study hours for each learning activity, as well as the hours of independent study, are specified in accordance with the principles of ECTS*	Study of bibliography	16
	Self-study of lecture material	40
	Oral presentation/ assessment of the projects	1
	Consultation Support	0.5
	Exams (written)	2
	Course Total	**137.5**

STUDENT ASSESSMENT *Description of the assessment process* *Language of assessment, assessment methods, formative or summative evaluation, multiple-choice tests, short-answer questions, essay questions, problem-solving, written assignments, reports, oral examinations, public presentations, laboratory work, clinical patient examination, artistic interpretation, other(s)* *Explicitly state assessment criteria and information on whether and where these criteria are accessible to students are included.*	**Language of Assessment**: Greek (English for ERASMUS students) **Assessment Mode**: Face-to-face and/or distance learning (if required) **Assessment Methods**: The final course grade is determined as follows: • 50% from the written examination during the spring semester exam period, and, in case of failure, during the September resits • 40% from the grade of the assignments • 10% from participation in activities conducted during lectures During the September examination period, the final grade is calculated as 50% from the written exam and 50% from the assignment grade. The written exam includes multiple-choice and short-answer questions. It is conducted as a closed-book exam. **Students with Learning Difficulties**: Students with certified learning difficulties in reading and writing (as recognized by the competent authority) are assessed according to the procedures established by the Department. **Disclosure of Assessment Criteria**: The assessment criteria are communicated during the first class and are clearly stated on the course website and the eClass platform. The exam syllabus is announced on eClass following the final lecture of the semester. The exam answers are posted on eClass after the examinations take place. Students have the right to review their graded exams and receive explanations regarding their grades. In cases of further requests, the procedures outlined in the current Study Regulations apply.

(5) SUGGESTED BIBLIOGRAPHY

- Books:

- Renneberg, R., Berkling, V., Loroch, V., Süßbier, D. (2020). Biotechnology – Basic Principles and Applications, Broken Hill Publishers, ISBN: 9789925575381 [86053293] – in Greek
- Vagdatli, E. (2022). Fundamentals of Bioethics, Altintzis Publications, ISBN: 9789609465625 [112705493] – in Greek

- Journals:

- Biotechnology Advances
- Current Opinion in Biotechnology
- Drug Discovery Today
- Technovation
- Trends in Biotechnology

- Other educational material:

- Matei, F., Zirra, D. (2019). Introduction to Biotech Entrepreneurship: From Idea to Business, A European Perspective, Springer, ISBN: 9783030221430, open access: https://link.springer.com/book/10.1007/978-3-030-22141-6
- Lecture Notes and Supporting Material provided by the Instructor