

COURSE CONTENT

(1) GENERAL INFO

SCHOOL	ENGINEERING		
DEPARTMENT	BIOMEDICAL ENGINEERING		
MSc PROGRAM	BIOMEDICAL ENGINEERING AND TECHNOLOGY		
STUDY LEVEL	POSTGRADUATE, MSc		
COURSE CODE	BMET209	SEMESTER	B
COURSE TITLE	Science, Technology, Society: Biomedical Engineering, Social Aspects, Ethics		
TEACHING		HOURS	ECTS
	LECTURES	26	5
COURSE TYPE	SPECIALIZATION		
COURSE REUIREMENTS:	-		
TEACHING AND EXAMINATION LANGUAGE:	ENGLISH		
IS THIS COURSE OFFER TO ERASMUS STUDENTS	YES (IN ENGLISH)		
COURSE WEBPAGE (URL)	https://eclass.uniwa.gr/courses/323/		

(2) LEARNING OUTCOMES

Learning outcomes
<p>Course Objectives: The course analyses the critical ethical and bioethical dimensions related to the development of technology in the field of biomedical engineering. Students will explore the history of ethics and bioethics, general ethical principles and theories, and the legal frameworks that shape practice in this field.</p> <p>Learning Outcomes: After the end of the course students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the evolution of ethical values and challenges in the field of bioethics. 2. Recognize and apply the key ethical principles and theories underlying biomedical engineering. 3. Understand the normative frameworks that shape bioethical practice. 4. Analyze the role of government, scientific societies, education, and health care institutions in biomedical engineering ethics. 5. Recognize the ethical challenges posed by technological advances. 6. Understand the need for ethics in practice, scientific research, data mining and industry in biomedical engineering. 7. Understand the importance of ethics and code of ethics in the professional practice of biomedical engineers. <p>Achievement of Course Objectives and Learning Outcomes: To achieve these objectives, the lectures will discuss issues related to the history of ethics, the basic principles of ethics, and legal frameworks. In the lectures, students will critically discuss further case studies and ethical dilemmas in the field of biomedical engineering.</p>
General abilities
<ul style="list-style-type: none"> • Search, analysis and synthesis of data and information • Adaptation to new situations • Decision making

- Working in an interdisciplinary environment
- Project planning and management
- Respect for diversity and multiculturalism
- Respect for the natural environment
- Demonstrating social, professional and ethical responsibility and sensitivity to gender issues
- Exercise of criticism and self-criticism
- Promotion of free, creative, productive and deductive thinking
- Ability to manage and transform complex and unpredictable work environments requiring new strategic approaches.

(3) COURSE CONTENT

"History of Ethics and Bioethics"

-Examination of the evolution of ethical values and challenges in the field of bioethics.

"General Principles and Theories of Ethics"

-Understanding the basic principles and theories that inform ethical thinking.

"Regulatory Frameworks"

-Examination of the legal frameworks governing bioethics and ethical practice.

"Technological Evolution and Ethical Boundaries"

-Examination of how technological advances affect ethical problems and constraints.

"Ethical Practices and Applications in Engineering Science"

-Applying ethical standards to practical issues in engineering.

-Understanding the role of ethics in various fields of application

-Specific ethical challenges in clinical engineering, clinical trials, development and maintenance of biomedical technologies.

"Patents in Biomedicine and Biomedical Engineering"

-Analysis of intellectual property rights.

"Code of Ethics for Biomedical Engineers"

-Examination of the ethical rules governing professionals in biomedical engineering.

(4) TEACHING AND LEARNING METHODS - EXAMINATIONS

COURSE DELIVERY	Physical presence, face to face at the auditorium	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The course is conducted with a projector (for the presentation of basic theory) and on the blackboard.	
TEACHING ORGANIZATION	Activity	Semester workload
	Teaching / lectures	26
	Lecture material study	30
	Unsupervised literature review and preparation of the final project	69
	Total	125
STUNDET EVALUATION	100% written or oral exam	

(5) SUGGESTED LITERATURE

Books, scientific articles and related scientific resources:

- [1] Beauchamp TL (1997). Comparative studies: Japan and America. In Kazumasa Hoshino (ed.). Japanese and Western bioethics, pp. 25-47. The Netherlands: Kluwer Academic Publishers.
- [2] Beauchamp TL (2003). A defense of the common morality. *Kennedy Inst Ethics J* 13(3):259-74.
- [3] Beauchamp TL, Childress JF (2009). Principles of biomedical ethics. 6th ed. Oxford: Oxford University Press.
- [4] National Society of Professional Engineers. (2007). "Ethics." Code of Ethics for Engineers. (online article). <http://www.nspe.org/resources/ethics/code-ethics>
- [5] Biomedical Engineering Society. (2004). "Ethics" Biomedical Engineering Society Code of Ethics.
- [6] Brey, P. (2009). 'Biomedical Engineering Ethics.' Eds. Berg-Olsen, J., Pedersen, S., Hendricks, V., A Companion to Philosophy of Technology. Blackwell.
- [7] Jong Yong Abdiel Foo, Stephen J. Wilson Andrew P. Bradley, Winston GweeDennis Kwok-Wing Tam. (2013). Ethics for Biomedical Engineers. Springer New York Heidelberg Dordrecht London, ISBN 978-1-4614-6912-4 ISBN 978-1-4614-6913-1 (eBook)
- [8] IEEE Engineering in Medicine and Biology Society (EMBS) (2011) IEEE EMBS code of ethics