HELLENIC REPUBLIC
UNIVERSITY OF WEST ATTICA
SCHOOL OF ENGINEERING
DEPARTMENT OF BIOMEDICAL ENGINEERING

Courses offered in English for ERASMUS+ students

Academic Year 2025-2026

Autumn/Winter Semester

Table of Contents

LIST OF COURSES OFFERED IN ENGLISH – SUMMARY

	STUDY PROGRAM	CODE	COURSE TITLE	ECTS
AUTUMN/WINTER SEMESTER 2024-2025				
1	Biomedical Engineering	NMB.301	PROBABILITIES, BIOSTATISTICS AND SYSTEMS RELIABILITY	5
2	Biomedical Engineering	NMB.304	BIOLOGY	5
3	Biomedical Engineering	NMB.502	RADIODIAGNOSTIC IMAGING: PHYSICAL PRINCIPLES AND INSTRUMENTATION	4
4	Biomedical Engineering	NMB.504	BIOMATERIALS AND TISSUE ENGINEERING	6
5	Biomedical Engineering	NMB.702	MEDICAL SIGNAL PROCESSING	5
6	Biomedical Engineering	NMB.705	LASERS IN MEDICINE	2
7	Biomedical Engineering	NMB.901	NON-IONIZING RADIATION IMAGING SYSTEMS	2
8	Biomedical Engineering	NMB.904	MACHINE LEARNING	5

All the courses mentioned above are available exclusively to incoming Erasmus students from the Engineering Faculties, Schools, or Departments that have an active Erasmus agreement with the University of West Attica.

DISCLAIMER

Potential changes in the above list may occur throughout the academic year.

***Before including any of the listed courses in your learning agreement**, please contact the organizing professors for final confirmation. Contact information is provided on the following pages.*

Study Program: Biomedical Engineering

MB.301
PROBABILITIES, BIOSTATISTICS AND SYSTEMS RELIABILITY
SPIROS KOSTOPOULOS
skostopoulos@uniwa.gr
Associate Professor
3rd (autumn/winter)
Biostatistics - Introduction to statistics - Descriptive statistics - Introduction to Probability - Random variables, distributions and their parameters. - The main descete distributions. - The main continuous distributions. - Confidence Intervals - Non-parametric statistics
5

Course Code	NMB.304
Title	**BIOLOGY**
Teacher	EVANGELIA PATSAVOUDI
Contact	epatsavoudi@umiwa.gr
Level	Professor
Semester	3rd (autumn/winter)
Course contents	-Introduction to the rules governing the phenomenon of life (interaction with the environment, exchange of matter and energy,homogeneity diversity evolution) -Chemistry of living matter (composition, structure and function of small and large biological molecules, etc.) -The cell (structure and function of intracellular organelles, cell membranes, cell metabolism, cellular communication, cell cycle) - Basic concepts of genetics (gene, mutations, molecular basis of heredity, from gene to protein, regulation of gene expression) - Viruses, cancer - Biotechnology
ECTS	5

Course Code	NMB.502
Title	**RADIODIAGNOSTIC IMAGING: PHYSICAL PRINCIPLES AND INSTRUMENTATION**
Teacher	PANAGIOTIS LIAPARINOS
Contact	liapkin@uniwa.gr
Level	Professor
Semester	5th (autumn/winter)
Course contents	Interaction of radiation with biological tissues - Radiation emission - X-ray light - Detection systems - High voltage generators - Radiographic diagnostic features - Classical X-ray systems - Generic radiology diagnostic system - Special imaging techniques - Digital radiodiagnostics - Physical principles and computational radiology systems
ECTS	4

Course Code	NMB.504
Title	**BIOMATERIALS AND TISSUE ENGINEERING**
Teacher	EVANGELIA PANTATOSAKI
Contact	epantatosaki@uniwa.gr
Level	Assistant Professor
Semester	5th (autumn/winter)
Course contents	• Introduction to the fields of biomaterials and tissue engineering, historical review • Crystal structures and defects • Physicochemical and mechanical properties of materials and biomaterials • Surface chemistry of materials and biomaterials • Metallic biomaterials, properties and applications • Ceramic biomaterials, properties and applications • Polymeric biomaterials, properties and applications • Advanced biomaterials and nano-biomaterials, properties and applications • Biomaterials of biological origin, properties and applications • Composites, properties and applications • Novel biomaterials for new in vitro diagnostics, targeted therapeutics, gene vaccines and immunotherapies • Interactions of biomaterials with blood, proteins, cells and tissues • Introduction to the structure and mechanics of cells and tissues • Structure and properties of scaffolds for tissue growth and regeneration • Basic principles in bioprocess engineering and bioreactor technology • Bioreactors in tissue engineering The course includes laboratory practice of two hours per week; laboratory work comprises experimental and computational exercises to study the structure and physicochemical and mechanical properties of biomaterials.
ECTS	6

Course Code	NMB.702
Title	**MEDICAL SIGNAL PROCESSING**
Teacher	DIONISIS CAVOURAS
Contact	cavouras@uniwa.gr
Level	Professor Emeritus
Semester	7th (autumn/winter)
Course contents	Medical Signals and Signal Properties Time/Spatial domain processing (Convolution, Correlation, Filtering) Frequency domain processing (1-D and 2-D Digital filters designed in the frequency domain: Ideal Filters, Butterworth filters, Gaussian Filters, Exponential Filters, Computed Tomography Filters, Restoration filters) FIR and IIR filters design and application to 1-D and 2-D signals Displaying 1-D and 2-D signals, Digital signal-quality enhancing methods, 2-D Filtering Methods, Tomographic Reconstruction Methods
ECTS	5

Course Code	NMB.705
Title	**LASERS IN MEDICINE**
Teacher	IOANNIS VALAIS
Contact	valais@uniwa.gr
Level	Professor
Semester	7th (autumn/winter)
Course contents	Fiber optics: Principles of operation and applications in medical technology. Laser: Principles of operation, optical cavities, applications in medicine. Effect of Laser beam on tissues Laser treatment induced phenomena Laser emission wavelengths interactions.

	Laser beam drive systems and categorization. Principles of operation of laser systems and applications in medicine and biology. Classification of Medical Lasers. Beam and system quality controls.Risks and means of protection.
ECTS	2

Course Code	NMB.901
Title	**NON-IONIZING RADIATION IMAGING SYSTEMS**
Teacher	NEKTARIOS KALYVAS
Contact	nkalyvas@uniwa.gr
Level	Professor
Semester	9th (autumn/winter)
Course contents	1. Magnetism of elementary particles. Nuclear Magnetic Resonance effect. Imaging techniques: Gradient fields, K-space and magnetic resonance imaging, pulse sequences, contrast enhancement agents. Magnetic Resonance Imaging Systems: Superconducting Magnets, Permanent Magnets, Radio Frequency Coils, Gradient Coils, etc. Installation and Quality Control of Magnetic Resonance Imaging System. Image quality in Magnetic Resonance, Protection from Electromagnetic Fields. 2. Ultrasound interaction with biological tissues. Piezoelectric effect and piezoelectric transducers. Ultrasonic mechanical and electronic scanning transducers. Doppler effect, Color Flow Display. General Assembly of Ultrasound Systems. Image quality in Ultrasound.
ECTS	2

Course Code	NMB.904
Title	**MACHINE LEARNING**
Teacher	DIONISIS CAVOURAS
Contact	cavouras@uniwa.gr
Level	Professor Emeritus
Semester	9th (autumn/winter)
Course contents	Introduction to Machine Learning Data pre-processing, Statistics, Regression Supervised Learning, Unsupervised Learning, Deep Learning, Transfer Learning, Reinforcement Learning Deployment of Machine Learning Models using real data
ECTS	5

Contact

Erasmus office:

https://erasmus.uniwa.gr/en/erasmus-studies/contact/

Ms. Berna Sekercioglu

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For academic inquires:

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e -mail: liapkin@uniwa.gr