



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

## **Courses offered in English for ERASMUS+ students**

**Academic Year 2024-2025**

Autumn/Winter Semester

## Table of Contents

<b>LIST OF COURSES OFFERED IN ENGLISH – SUMMARY .....</b>	<b>3</b>
<b>STUDY PROGRAM: BIOMEDICAL ENGINEERING .....</b>	<b>4</b>
<b>STUDY PROGRAM: BIOMEDICAL ENGINEERING AND TECHNOLOGY (MSC COURSES) .....</b>	<b>6</b>
<b>CONTACT .....</b>	<b>7</b>

# LIST OF COURSES OFFERED IN ENGLISH – SUMMARY

	STUDY PROGRAM	CODE	COURSE TITLE	ECTS
<b>AUTUMN/WINTER SEMESTER 2024-2025</b>				
1	Biomedical Engineering	NMB.502	RADIOLOGICAL IMAGING: PHYSICAL PRINCIPLES AND INSTRUMENTATION	5
2	Biomedical Engineering	NMB.703	PHYSICS OF NUCLEAR MEDICINE	4
3	Biomedical Engineering	NMB.705	LASERS IN MEDICINE	2
4	Biomedical Engineering	NMB.901	NON-IONIZING RADIATION IMAGING SYSTEMS	2
5	Biomedical Engineering and Technology (MSc)**	BMET105	BIOSTATISTICS	5
6	Biomedical Engineering and Technology (MSc)**	BMET106	MEDICAL SIGNAL AND IMAGE PROCESSING	5

**\*\*Courses are organized in intensive manner within 2-4 weeks period.  
Attendance to these courses is mandatory.**

## DISCLAIMER

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

***Before including any of the above courses in your learning agreement, please  
contact the organizing Professors of these courses for final confirmation  
(contact info is provided in the following pages).***

## Study Program: Biomedical Engineering

Course Code	NMB.502
<b>Title</b>	<b>RADIOLOGIC IMAGING: PHYSICAL PRINCIPLES AND INSTRUMENTATION</b>
Teacher	PANAGIOTIS LIAPARINOS
Contact	<a href="mailto:liapkin@uniwa.gr">liapkin@uniwa.gr</a>
Level	Associate Professor
Semester	5 <sup>th</sup> (autumn/winter)
<b>Course contents</b>	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	5

Course Code	NMB.703
<b>Title</b>	<b>PHYSICS OF NUCLEAR MEDICINE</b>
Teacher	GEORGE FOUNTOS
Contact	<a href="mailto:gfoun@uniwa.gr">gfoun@uniwa.gr</a>
Level	Professor
Semester	7 <sup>th</sup> (autumn/winter)
<b>Course contents</b>	<ul style="list-style-type: none"> <li>• Introduction to Nuclear Physics.</li> <li>• Radioactivity. Production of radioactive isotopes. Radiopharmaceuticals.</li> <li>• Radiation Detectors (Photon Counters): Scintillators, Photomultipliers.</li> <li>• Collimators. Electronic signal modulation, Pulse height analyzers.</li> <li>• Gamma-camera imaging systems and Single photon emission computed tomography systems (SPECT).</li> <li>• Annihilation phenomenon and Positron Emission Tomography (PET) Systems.</li> <li>• Special type imaging and measuring systems (analogue camera, solid-state camera, gamma counters, whole body counters, counters for measuring of functional parameters etc.).</li> <li>• Image quality in Nuclear Medicine.</li> <li>• Dosimetry and Radiation Protection in Nuclear Medicine.</li> <li>• Quality control protocols in Nuclear Medicine.</li> </ul>
ECTS	4

Course Code	NMB.705
<b>Title</b>	<b>LASERS IN MEDICINE</b>
Teacher	IOANNIS VALAIS
Contact	<a href="mailto:valais@uniwa.gr">valais@uniwa.gr</a>
Level	Professor
Semester	7 <sup>th</sup> (autumn/winter)
<b>Course contents</b>	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
<b>Title</b>	<b>NON-IONIZING RADIATION IMAGING SYSTEMS</b>
Teacher	NEKTARIOS KALYVAS
Contact	<a href="mailto:nkalyvas@uniwa.gr">nkalyvas@uniwa.gr</a>
Level	Professor
Semester	9 <sup>th</sup> (autumn/winter)
<b>Course contents</b>	<p>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.</p> <p>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.</p>
ECTS	2

## Study Program: MSc in Biomedical Engineering and Technology (MSc courses)

Course Code	BMET.105 ( <b>MSc course</b> )
<b>Title</b>	<b>BIOSTATISTICS</b>
Teacher	SPIROS KOSTOPOULOS
Contact	<a href="mailto:skostopoulos@uniwa.gr">skostopoulos@uniwa.gr</a>
Level	Associate Professor
Semester	1 <sup>st</sup> (autumn/winter)
<b>Course contents</b>	Introduction Descriptive statistics Diagnostic tests Probability Distributions – Random Variables Estimators – Confidence Intervals Hypothesis tests No parametric tests Correlation
ECTS	5

Course Code	BMET.106 ( <b>MSc course</b> )
<b>Title</b>	<b>MEDICAL SIGNAL AND IMAGE PROCESSING</b>
Teacher	CAOURAS DIONISIS
Contact	<a href="mailto:cavouras@uniwa.gr">cavouras@uniwa.gr</a>
Level	Professor Emeritus
Semester	1 <sup>st</sup> (autumn/winter)
<b>Course contents</b>	Introduction to Biomedical Digital Signal Processing (Bio_DSP) Time Domain Bio_DSP (Convolution/correlation) Frequency Domain Bio_DSP Filter Design and Implementation for Bio_DSP Introduction to Biomedical Image Processing (Bio_IP) Gray Scale modification Methods for Bio_IP Design and implementation of Spatial Domain Filters for Bio_IP Design and Implementation of Freq. Domain Filters for Bio_IP Tomographic reconstruction Methods 3-D rendering and display of Biomedical Images
ECTS	5

# Contact

## Erasmus office:

Mr. Stefanos Peroulis

<https://erasmus.uniwa.gr/en/erasmus-traineeship/contact-2/>

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Ms Fani Papoutsi

<https://erasmus.uniwa.gr/en/contact/>

e-mail: [erasmus.global@uniwa.gr](mailto:erasmus.global@uniwa.gr)

## For academic inquires:

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