



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

Courses offered in English for ERASMUS+ students

Academic Year 2019-2020

Table of Contents

COURSES OFFERED IN ENGLISH – SUMMARY	3
COURSE CONTENTS - WINTER SEMESTERS	4
1 st semester.....	4
3 rd semester	5
5 th semester	7
7 th semester	8
9 th semester	9
COURSE CONTENTS - SUMMER SEMESTERS	11
2 nd semester	11
4 th semester	12
6 th semester	14
8 th semester	16
10 th semester.....	18
CONTACT	19

COURSES OFFERED IN ENGLISH – SUMMARY

	SEMESTER	CODE	COURSE TITLE	ECTS
WINTER SEMESTERS				
1	1	105	ENGINEERING MECHANICS	2
2	1	106	INTRODUCTION TO COMPUTER PROGRAMMING PRINCIPLES (PROGRAMMING I)	5
3	3	301	PROBABILITIES, BIostatISTICS AND SYSTEMS RELIABILITY	5
4	3	304	BIOLOGY	5
5	3	306	DIGITAL SYSTEMS	5
6	5	502	RADIOLOGIC IMAGING: PHYSICAL PRINCIPLES AND INSTRUMENTATION	5
7	5	504	BIOMATERIALS AND TISSUE ENGINEERING	6
8	7	702	MEDICAL SIGNAL PROCESSING	5
9	7	703	PHYSICS OF NUCLEAR MEDICINE	4
10	9	901	NON IONIZING RADIATION IMAGING SYSTEMS	2
11	9	904	MACHINE LEARNING	5
12	9	906	OPTICAL MICROSCOPY AND ANALYSIS OF BIOLOGICAL IMAGES	5
13	9	907	DECISION SUPPORT SYSTEMS IN MEDICINE AND BIOLOGY	5
14	9	909	METHODS OF BIOMEDICAL TECHNOLOGY ASSESSMENT	2
15	9	911	PRACTICAL TRAINING	4
SUMMER SEMESTERS				
16	2	204	TECHNICAL DRAWING	3
17	2	205	COMPUTER PROGRAMMING METHODS IN MEDICINE (PROGRAMMING II)	5
18	4	402	BIOMECHANICS	3
19	4	403	PHYSIOLOGY	4
20	4	406	MECHANICAL AND MACHINE ENGINEERING	5
21	4	407	OPTOELECTRONICS	4
22	6	604	MATHEMATICAL MODELING OF BIOLOGICAL AND PHYSIOLOGICAL PROCESSES	4
23	6	605	DESIGN AND CONSTRUCTION OF BIOMEDICAL DEVICES	4
24	6	607	MEDICAL INSTRUMENTATION	4
25	6	608	AUTOMATED CONTROL SYSTEMS	4
26	8	801	RADIATION PROTECTION QUALITY ASSURANCE AND CONTROL	6
27	8	803	MEDICAL IMAGE PROCESSING	5
28	8	805	PATTERN RECOGNITION	4
29	8	807	IMAGE FORMATION SCIENCE	4
30	8	809	BIOMEDICAL MEMS & NEMS	4
31	10	1001	DIPLOMA THESIS	30

Important: Potential changes in the above list may occur throughout the academic year. To verify that the course you have selected will be delivered in English, please send an e-mail to a/ the professor of the course and b/ the academic ERASMUS+ coordinator of the Department (contact details are provided in the following pages).

WINTER SEMESTERS

Beginning of October – End of January / beginning of February

1st semester

Course Code	MB.105
Title:	ENGINEERING MECHANICS
Teacher:	DIMITRIS GLOTSOS
Contact:	dimglo@uniwa.gr
Level	Associate Professor
Semester	1 st (winter)
Course contents	<ul style="list-style-type: none">• Mechanics, fundamental concepts, force, vectors, system coordinates, calculus of vectors• Concept of moment, static equilibrium• Force and moment diagrams• Structural elements and loads• Stress, strain, tension, compression, shear, bending, elasticity, factor of safety• Stress and deformation diagrams• Technical mechanics and the human body: muscle-joints-skeletal system and movement, breathing mechanics and pressures in the lungs, cardiovascular mechanics and pressures in the heart and vessels, hearing mechanics and pressures in the ear
Number of Credits	2

Course Code	MB.106
Title:	INTRODUCTION TO COMPUTER PROGRAMMING PRINCIPLES (PROGRAMMING I)
Teacher:	DIONISIS CAVOURAS
Contact:	cavouras@uniwa.gr
Level	Professor Emeritus
Semester	1 st (winter)
Course contents	Introduction to computers, algorithms, programming languages, program structure, variables (integer, double, strings, characters, logic), operators (arithmetic, comparative, logic), Input-Output, Control statements (if, for, switch, while), vectors, arrays, string arrays, functions, 2-d and 3-d graphics
Number of Credits	3

3rd semester

Course Code	MB.301
Title:	PROBABILITIES, BIOSTATISTICS AND SYSTEMS RELIABILITY
Teacher:	SPIROS KOSTOPOULOS
Contact:	skostopoulos@uniwa.gr
Level	Assistant Professor
Semester	3 rd (winter)
Course contents	<p>Biostatistics</p> <ul style="list-style-type: none"> - Introduction to statistics - Descriptive statistics - Introduction to Probability - Random variables, (sq. M), distributions sq. and their parameters. - The main distinct one-dimensional distributions. - The main continuous one-dimensional distributions. - Confidence Intervals - Non-parametric statistics (X2 - Customization check, X2 - Independence check X2 - Homogeneity test - Applications) - Dependency – Correlation - Linear regression – Applications - System reliability - Survival function - Kaplan Meier estimator <p>Introduction to Probability of Systems Reliability and Survival Analysis</p> <ol style="list-style-type: none"> 1. Fortune experiments - Sample spaces and contingencies. 2. The concept of probability. 3. Reserved probability - Independence 4. Random variables, (sq. M), distributions sq. and their parameters. 5. The main distinct one-dimensional distributions. 6. The main continuous one-dimensional distributions. 7. Average value of random variable 8. System reliability 9. Reliability function 10. Survival function 11. Hazard Function 12. Kaplan Meier estimator 13. Analogical risk models
Number of Credits	5

Course Code	MB.304
Title:	BIOLOGY
Teacher:	EVANGELIA PATSAVOUDI
Contact:	epatsavoudi@uniwa.gr
Level	Professor
Semester	3 rd (winter)
Course contents	<ol style="list-style-type: none"> 1. Introduction to the rules governing life phenomena (interactions with the environment, exchange of matter, homogeneity diversity, evolution) 2. Chemistry of living matter (composition, structure and function of small and large biological molecules, etc.) 3. The cell (structure and function of intracellular organelles, cell membranes, cellular metabolism, cellular communication, cell cycle) 4. Basic concepts of genetics (gene, mutations, molecular basis of inheritance, from gene to protein, regulation of gene expression) 5. Viruses, cancer, biotechnology
Number of Credits	5

Course Code	MB.306
Title:	DIGITAL SYSTEMS
Teacher:	SPIROS KOSTOPOULOS
Contact:	skostopoulos@uniwa.gr
Level	Assistant Professor
Semester	3 rd (winter)
Course contents	<ul style="list-style-type: none"> • Introductory principles of digital systems • Numerical systems and codes • Logic analysis • Boolean Algebra and logical simplification • Combined logic analysis • Combined logic functions • Flip-Flop, Timers • Registers • Counters • Storage
Number of Credits	5

5th semester

course Code	MB.502
Title:	RADIODIAGNOSTIC IMAGING: PHYSICAL PRINCIPLES AND INSTRUMENTATION
Teacher:	PANAGIOTIS LIAPARINOS
Contact:	liapkin@uniwa.gr
Level	Assistant Professor
Semester	5 th (winter)
Course contents	<p>Interaction of radiation with biological tissues</p> <ul style="list-style-type: none"> - 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
Number of Credits	6

Course Code	MB.504
Title:	BIOMATERIALS AND TISSUE ENGINEERING
Teacher:	MARIA KALLERGI
Contact:	kallergi@uniwa.gr
Level	Associate Professor
Semester	5 th (winter)
Course contents	<ul style="list-style-type: none"> • Introduction to the fields of biomaterials and tissue engineering, historical review • Physicochemical properties and structure • Crystal structures and crystal defects • Mechanical properties and stress/strain curves • Physical and chemical properties of biomaterials • Surface characterization methods • Cells and tissues, features and methods of reproduction • Metallic biomaterials, properties and applications • Ceramic biomaterials, properties and applications • Polymeric biomaterials, properties and applications
Number of Credits	8

7th semester

Course Code	MB.702
Title:	MEDICAL SIGNAL PROCESSING
Teacher:	DIONISIS CAVOURAS
Contact:	cavouras@uniwa.gr
Level	Professor Emeritus
Semester	7th (winter)
Course contents	Analogue to Digital conversion of signals • Signals and systems: discrete time signals, signal properties(convolution/correlation) • Frequency domain processing: discrete Fourier transform, frequency domain filters (low pass, high pass, band-pass, band-reject), filtering in the Frequency Domain, Wavelet Transform, Z-transform, digital filter implementations (DFI, DFII, serial, parallel structures), digital filter design: Infinite Impulse Response (IIR), Finite Impulse Response (FIR).Applications of Digital Signal Processing in electrocardiography, electroencephalography, electromyography.
Number of Credits	5

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

9th semester

Course Code	MB.901
Title:	NON IONIZING RADIATION IMAGING SYSTEMS
Teacher:	NEKTARIOS KALYVAS
Contact:	nkalyvas@uniwa.gr
Level	Assistant Professor
Semester	9 th (winter)
Course contents	<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>
Number of Credits	2

Course Code	MB.904
Title:	MACHINE LEARNING
Teacher:	DIONISIS CAVOURAS
Contact:	cavouras@uniwa.gr
Level	Professor Emeritus
Semester	9 th (winter)
Course contents	Introduction to Machine Learning basics, supervised learning/regression/classification, unsupervised Learning/dimensionality reduction/clustering, reinforcement learning, deep learning/artificial Neural Networks/convolutional Neural Networks/
Number of Credits	5

Course Code	MB.906
Title:	OPTICAL MICROSCOPY AND ANALYSIS OF BIOLOGICAL IMAGES
Teacher:	DIMITRIS GLOTSOS
Contact:	dimglo@uniwa.gr
Level	Associate Professor
Semester	9 th (winter)
Course contents	<ul style="list-style-type: none"> • Introduction, light and color, human visual system, light and matter interaction, • Basic instrumentation of optical microscope, types of optical microscope • Lenses, filters, magnification, focus, diffraction, and resolution • Fluorescence microscopy, confocal microscopy, special systems, superresolution microscopy, hybrid systems • Applications of microscopy in medicine and biology, cytology, histopathology, preparation and processing of samples • Digitization of images, analysis of biological images, morphometry, texture, architecture, extraction of features, feature interpretation, computer-aided decision support systems • Image Degradation Model, Image Restoration / Deconvolution • Examples of processing and analysis of biological images (histopathology, cytology, fluorescence, microarrays, proteomics, FISH, FRAP, in vitro and in vivo, etc.)
Number of Credits	5

Course Code	MB.907
Title:	DECISION SUPPORT SYSTEMS
Teacher:	DIMITRIS GLOTSOS
Contact:	dimglo@uniwa.gr
Level	Associate Professor
Semester	9th (winter)
Course contents	<ul style="list-style-type: none"> • Introduction, historical review, diagnostic errors, necessity of decision support systems in medicine and biology • Decision making processes in medicine and biology • Decision support system structure, collection, processing, analysis of medical data, optimization and decision-making, reliability assessment • Design and implementation of decision support systems, standardization, machine learning, artificial intelligence, internet, telemedicine, health information systems • Examples of decision support systems in medicine and biology (early diagnosis of melanoma, grade malignancy in brain cancer, benign and malignant differentiation in breast cancer, recognition of biomarkers in proteomic spectra, gene expression study, etc.) • Commercial systems, legal issues and bioethics issues
Number of Credits	5

Course Code	MB.909
Title:	METHODS OF BIOMEDICAL TECHNOLOGY ASSESSMENT
Teacher:	MARIA KALLERGI
Contact:	kallergi@uniwa.gr
Level	Associate Professor
Semester	9th (winter)
Course contents	<ul style="list-style-type: none"> •Definitions and goals of medical technology assessment (MTA) •Methods of MTA (cost-benefit analysis, cost-utility analysis, cost-effectiveness analysis, cost-minimization analysis, budget impact analysis, and other economic analyses) •Parameters of MTA (quality adjusted life years, disability adjusted life years, etc) •Links between MTA, medical technology management, and medical technology regulation •MTA international •Strategies for MTA
Number of Credits	2

Course Code	MB.911
Title:	PRACTICAL TRAINING
Teacher:	All Labs of the department
Contact:	Candidates must contact the Professors of the department and agree upon the subject of the Practical Training (http://www.bme.teiath.gr/en_staff.html)
Level	-
Semester	8th (summer)
Course contents	<p>The practical training should provide the student with</p> <ul style="list-style-type: none"> • basic knowledge of engineering and biomedical sciences • the ability to specialize into a specific subject of biomedical engineering, design experiments and/or conduct research • the ability to work with specialized scientists on the field of biomedical engineering
Number of Credits	8

SUMMER SEMESTERS

End of February / beginning of March – End of June / beginning of July

2nd semester

Course Code	MB.204
Title:	TECHNICAL DRAWING
Teacher:	SPIROS KOSTOPOULOS
Contact:	skostopoulos@uniwa.gr
Level	Assistant Professor
Semester	2 nd (summer)
Course contents	<ul style="list-style-type: none"> • Introduction to technical drawing • Basic design regulations and instruments • Design of views from the axonometric representation by the method of rectangular projections • General dimensioning criteria • Cross sections and flat sections. Screw and thread design • Mechanical fittings, sections. • Computer Aided Design (CAD) • Introduction to Electrical and Electronic Design • Internal Electrical Installation Design Rules • Symbols (lines, switches, switchboards, relays, electronic symbols), • Design of electric machines • Design of electrical installations • Design of Printed Circuits with PCs
Number of Credits	3

Course Code	MB.205
Title:	COMPUTER PROGRAMMING METHODS IN MEDICINE (PROGRAMMING II)
Teacher:	DIONISIS CAVOURAS
Contact:	cavouras@uniwa.gr
Level	Professor Emeritus
Semester	2 nd (summer)
Course contents	Multidimensional arrays, recursive functions, structures, file write/append/read procedures, classification, introduction to bio-signal processing, introduction to basic principles of medical image processing, program optimization.
Number of Credits	3

4th semester

Course Code	MB.402
Title:	BIOMECHANICS
Teacher:	MARIA KALLERGI
Contact:	kallergi@uniwa.gr
Level	Associate Professor
Semester	4 th (summer)
Course contents	<ul style="list-style-type: none"> • Introduction to biomechanics of human movement • Fundamental principles and qualitative analysis • Anatomical concepts • Mechanics of the musculoskeletal system • Linear and angular kinematics • Linear and angular kinetics • Fluid biomechanics • Review of primary fields of biomechanics, i.e., sports, ergonomics, and clinical • Examples of applications of biomechanics in physical education, sports medicine and rehabilitation, strength and conditioning, coaching
Number of Credits	3

Course Code	MB.403
Title:	PHYSIOLOGY
Teacher:	EVANGELIA PATSAVOUDI
Contact:	epatsavoudi@uniwa.gr
Level	Professor
Semester	4 th (summer)
Course contents	<p>Introduction and familiarization of students with basic knowledge about the functioning of human systems. More specifically:</p> <ol style="list-style-type: none"> 1. Cellular organization 2. Blood 3. Immune System 4. Nerves - Muscles 5. Organization of Central and Autonomic Nervous System 6. Respiratory system 7. Cardiovascular System 8. Digestive System 9. Kidneys 10. Hormones (endocrine)
Number of Credits	4

Course Code	MB.406
Title:	MECHANICAL AND MACHINE ENGINEERING
Teacher:	DIMITRIS GLOTSOS
Contact:	dimglo@uniwa.gr
Level	Associate Professor
Semester	4 th (summer)
Course contents	<ul style="list-style-type: none"> • Metrology, units of measurement • Measurement of dimensions, errors, tolerances • Measurement reliability, standards

	<ul style="list-style-type: none"> • Introduction to Machining Technology, Machine Forming, Machine Tools, Lathe, Drill, Milling Machine, Screw etc • Resistance to materials, stresses • Basic principles of simple machine operation • Connections, nozzles, screw connections, wedges, welds • Spindles, rotors, couplings, support bearings • Drive systems, rotary drive, gearboxes • Basic machine types, fundamental principles and operation
Number of Credits	5

Course Code	MB.407
Title:	OPTOELECTRONICS
Teacher:	IOANNIS VALAIS
Contact:	valais@uniwa.gr
Level	Professor
Semester	4 th (summer)

Course contents	<ul style="list-style-type: none"> • Introduction to the interactions of light with matter. • Photoelectric effect. Photoconductivity. • Light detectors. • Optical components: LEDs, liquid crystals (principles of operation and applications), • Phototransistors and photodiodes. • Optical fibers: Principles of operation and applications in medical technology. • Laser: Principles of operation, optical cavities, applications in medicine. • Special photometry issues. • Laser Safety: Risks, Hazards and control measures
Number of Credits	5

6th semester

Course Code	MB.604
Title:	MATHEMATICAL MODELING OF BIOLOGICAL AND PHYSIOLOGICAL PROCESSES
Teacher:	MARIA KALLERGI
Contact:	kallergi@uniwa.gr
Level	Associate Professor
Semester	6 th (summer)
Course contents	<ul style="list-style-type: none"> • Introduction to the modeling of biological and physiological systems, use of computational tools (EXCEL, MATLAB, others) • Types of biological / physiological models – examples • Introduction to descriptive statistics and basic parameters for the analysis of biomedical data • Design of experiments and clinical studies • Use of differential equations to describe physiological phenomena • Principles and models of pharmacokinetics • Analog models for biological and physiological systems
Number of Credits	4

Course Code	MB.605
Title:	DESIGN AND CONSTRUCTION OF BIOMEDICAL DEVICES
Teacher:	IOANNIS VALAIS
Contact:	valais@uniwa.gr
Level	Professor
Semester	7 th (winter)
Course contents	<p>Theory</p> <p>Theoretical description of the basic electrical and electronic components used in medical devices. Production and measurement of analogue and digital signals Introduction to Electronics and Microcontrollers Architecture and Microcontroller Subsystems Microcontroller circuits and device connectivity Input-Output Devices Signal acquisition and processing by sensors Microcontroller Programming and Application Programs Microcontroller platforms and connectivity issues</p> <p>Laboratory</p> <p>A complete study of a specific device, containing 1) the theoretical approach to the signal that the device will detect, the electronic schematic, the technical description, the design of the electronic board to be used, and the design of the housing. Introduction to the use of microcontrollers in medical devices, basics and programming examples Simulation of device operation and programming of the embedded microcontroller. Construction of the device, based on the study. Testing, and delivering the device in full and safe mode, in its housing, supplied by its user and maintenance manual</p>
Number of Credits	4

Course Code	MB.607
Title:	MEDICAL INSTRUMENTATION
Teacher:	DIMITRIS GLOTSOS
Contact:	dimglo@uniwa.gr
Level	Associate Professor
Semester	6 th (summer)

Course contents	<ul style="list-style-type: none"> • Medical Devices and Systems, Terminology, Domestic and International Standardization • Basic structure of medical systems, design principles • Sensors, Bio-Signals • Biomedical electronics, amplifiers, filters, signal conditioning • Microcontrollers and Microprocessors in medical systems • Instrumentation in vital function monitoring systems (temperature, pressure, flow, ECG, EEG, EMG) • Oximetry instrumentation • Instrumentation in in vitro diagnostics • Instrumentation in medical imaging • Instrumentation on special medical devices • Patient safety
Number of Credits	4

Course Code	MB.608
Title:	AUTOMATED CONTROL SYSTEMS
Teacher:	MARIA KALLERGI
Contact:	kallergi@uniwa.gr
Level	Associate Professor
Semester	6 th (summer)
Course contents	<ul style="list-style-type: none"> • History and review of automated control. • Principles of control without and with feedback. • Laplace transform. • Transfer functions. • Block diagrams and algebra of block diagrams as applied to control systems. Characteristics of control systems. • System sensitivity measures and classification of feedback systems. • Time response and stability theory, Routh-Hurwitz criterion. • Basics of root locus analysis. • Design and development of basic control circuits. • Design and development of analog PID controller. • Use of integrated PID for controlling flow, pressure, and temperature.
Number of Credits	4

8th semester

Course Code	MB.801
Title:	RADIATION PROTECTION QUALITY ASSURANCE AND CONTROL
Teacher:	GEORGE FOUNDOS
Contact:	gfoun@uniwa.gr
Level	Professor
Semester	8 th (summer)
Course contents	<ul style="list-style-type: none"> • Introduction to radiation physics • Radiation sources, Electromagnetic spectrum, Ionizing and non-ionizing radiation, Natural and Artificial sources, Ways of Exposure to Radiation • Radioactivity, Nuclear stability-instability, Radioisotopes • Types of Radiation (α, β, γ, neutrons, etc.) • Radiation-matter Interaction Shielding, Excitement, Ionization or Ionization Law of Exponential Fading, Law Inverse square of Distance. • Dosimetric Units, Absorbed, Equivalent, Active Dose, Skin Dose, DAP Size • Ionizing Radiation Detection, Gas Radiation Detectors, Scintillation Detectors, Detectors Thermoluminescence TLD • Detection of non-ionizing radiation. • Radiation Protection System, International-National Radiation Protection System, Legislation • Protection of exposed workers, Classification and delimitation of zones, Classification of exposed Workers protection measures, Worker exposure assessment • Principles of radiation protection in medical exposure, Medical reports, Optimization of medical reports. • Applied protection measures in Radiology, Nuclear Medicine, Radiotherapy, Legislation. • Influence of imaging parameters on medical image quality • Quality Assurance Programs and Quality Controls, Necessity • Protocols for quality control in Radiology, Nuclear Medicine, Radiotherapy. • How to Perform Quality Controls. • Legislation governing Quality Controls
Number of Credits	6

Course Code	MB.803
Title:	MEDICAL IMAGE PROCESSING
Teacher:	DIMITRIS GLOTSOS – DIONISIS CAVOURAS
Contact:	dimglo@uniwa.gr , cavouras@uniwa.gr
Level	Associate Professor , Professor Emeritus
Semester	8 th (summer)
Course contents	<ul style="list-style-type: none"> • Image formation, digitization • Compression and encoding • Image quality, upgrading and restoration, convolution-correlation, field filtering and frequency domain • Image segmentation • Tomographic reconstruction, three-dimensional imaging • Registration and fusion • Clinical applications in X-ray CT, nuclear medicine, MRI, ultrasound, microscopy, thermography, etc.
Number of Credits	5

Course Code	MB.805
Title:	PATTERN RECOGNITION
Teacher:	DIONISIS CAVOURAS
Contact:	cavouras@uniwa.gr
Level	Professor Emeritus
Semester	8 th (summer)

Course contents	Statistical analysis of medical signals and images, feature generation, feature selection methods, classification algorithms, ensemble classifier schemes, clustering, design and evaluation methods of pattern recognition systems, review of pattern recognition systems in medicine.
Number of Credits	4

Course Code	MB.807
Title:	IMAGE FORMATION SCIENCE
Teacher:	NEKTARIOS KALYVAS
Contact:	nkalyvas@uniwa.gr
Level	Assistant Professor
Semester	8 th (summer)

Course contents	I. Theory of linear systems and mathematical formalization of information and noise transmission in the field and spatial frequencies II. Implementation of the theory of information and noise transmission in Radiology, Nuclear Medicine, Magnetic Resonance Imaging and Ultrasound III. Human observer and subjective image perception. IV. Artifacts in imaging systems. V. Virtual reality and image creation, holography.
Number of Credits	4

Course Code	MB.809
Title:	BIOMEDICAL MEMS & NEMS
Teacher:	MARIA KALLERGI
Contact:	kallergi@uniwa.gr
Level	Associate Professor
Semester	8th (summer)

Course contents	<ul style="list-style-type: none"> • Introduction and definitions of micro and nano electromechanical engineering • MEMS and NEMS basic principles • Top-down and bottom-up development methods • MEMS and NEMS characterization methods • Physics of microfluids and nanofluorescents • Lab on a chip (LOC) characteristics and design • Biomedical applications, implantable and external LOC, laboratory, hospital, and personal systems, combinations with SMARTPHONE APPS
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Number of Credits	4
Course Code	MB.805

10th semester

Course Code	MB.1001
Title:	DIPLOMA THESIS
Teacher:	All Professors of the department
Contact:	Candidates must contact the Professors of the department and agree upon the subject of the Project Thesis (http://www.bme.teiath.gr/en_staff.html)
Level	-
Semester	10 th (summer)
Course contents	<ul style="list-style-type: none">• Independent development of a small project in the field of biomedical engineering, including literature reviews, software programming, hardware design, and experimental work• Presentation of the findings of the project in both oral and written formats, writing the Bachelor Thesis and Public Defense of the Thesis
Number of Credits	30

Contact

For academic inquires:

Dimitris Glotsos, Associate Professor, Departmental ERASMUS+ Coordinator
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Location: [Campus 1](#)

For administrative inquiries:

Mr. Stefanos Peroulis
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