Πανεπιστήμιο Δυτικής Αττικής

Σχολή Μηχανικών

Τμήμα Μηχανολόγων Μηχανικών

Α11

Εσωτερικός κανονισμός λειτουργίας ΠΜΣ Προηγμένα Βιομηχανικά Συστήματα Παραγωγής
(παρ. 4, αρ. 79 του ν.4957/2022)

Απόφαση Συγκλήτου ΠΑΔΑ 19/10-12-2024 θέμα 33

MSc Advanced Product Design Engineering and Manufacturing

(ΠΜΣ Προηγμένα Βιομηχανικά Συστήματα Παραγωγής)

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Article 1: General Provisions

The Department of Mechanical Engineering of the University of West Attica, organizes and operates a Master of Science (MSc) Program titled "Advanced Product Design Engineering and Manufacturing", in accordance with the provisions of Law 4957/2022 (Government Gazette 141A'), as in effect. The program is delivered in English language. The MSc Program of the Mechanical Engineering Department is part of the objectives and the general mission of the University of West Attica (UniWA). It aims at the further advancement of scientific knowledge, the development of research and the high-level specialization of graduates in theoretical and applied areas of the field of Advanced Industrial Production Systems, which is core topic of the Department of Mechanical Engineering.

Article 2: Organization of Studies

The objective of the MSc Program is the postgraduate teaching, research and application of methods from state-of-the-art technologies in the related fields of modern Industrial Product Design, in combination with Manufacturing Management. The MSc is governed by scientific coherence, has a subject related to the scientific fields of the Department that organizes it and meets the requirements that guarantee a high level of study. During its establishment, emphasis will be placed on the subjects that are on a significant rise in the current period in the field of engineering, such as Additive and Subtractive Manufacturing, Artificial Intelligence (AI), new materials, Reverse Engineering (RE), Mechatronics and Robotics.

The aim of the MSc, which is addressed to Higher Education graduates, is to integrate modern methods with manufacturing. It offers specialization in the field of Industrial Production Systems aiming at:

- equipping engineers with all necessary skills on modern methods used in manufacturing
- to enhance the rational and effective approach to modern issues of industrial production
- to develop and expand the managerial skills of engineers for professional success in the private, public and academic sectors in all MSc topics

The MSc implements a combination of in-depth studies in state-of-the-art technologies (CAD/CAM/CAE, Additive Manufacturing, Artificial Intelligence, Reverse engineering, Mechanical Engineering, Robotics, new materials), combined with courses in Quality Management and Production Line Optimization, Project Management, Research Methods and Product Development and Production.

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

- Deepen their knowledge in specialized topics of the subject of Mechanical Engineering to promote knowledge, the development of research and the arts, as well as the satisfaction of the educational, research, social, cultural and developmental needs of the country,
- Expand and develop smooth partnerships at educational, research and, by extension, working level
- Analyze problems, compose solutions and evaluate comparatively alternative approaches in specialized fields of engineering,

- Develop problem-solving skills and the ability to apply these skills in developing innovative solutions for the actual needs of society.
- Have develope and actively demonstrate an awareness of the ethics and rules of research, of the personal, social, economic and environmental aspects and consequences and identify unresolved issues and related challenges.
- describe and present their work and its results in a proper, accurate and concise manner, in an individual or group context and in an oral, written or other supervisory way
- be inspired to produce and apply new ideas and new methodological approaches in the field of industrial production
- develop their research interests to continue their studies in the third cycle of doctoral studies in specialized fields within the field of Mechanical Engineering.

For the successful completion of the MSc and the award of the diploma, the student must complete a total of 90 ECTS credits, including all compulsory courses, elective compulsory courses and the Disserttion.

In the first semester, the students attend three (3) courses. The two courses aim to reinforce the basic knowledge required for the students to acquire the necessary background and application of CAD/CAE systems and Quality & Project Management in Industrial Production Systems. The third course aims to delve deeper into Robotics Systems and Intelligent Manufacturing Systems.

In the second semester, students attend three courses. Additive & Subtractive Manufacturing as well as Reverse Engineering Design are initially analysed. The courses so far synthesize a basic core of knowledge and skills for the integrated development and production of industrial products using modern tools and methodologies. In this semester, students are required to choose two out of three offered courses. The first one is on Mechatronic Design and Industrial Control applied to modern Industrial Production. The second course is on the AI in the field of engineering, through which students learn the practical application of AI through case studies. The third course is an in-depth study of CAD/CAE systems combined with Additive Manufacturing technologies.

In the third semester, PS are required to choose two out of three immersion modules. The first is on Mechanical Design and Industrial Control applied to modern Industrial Production. The second elective module focuses on AI in engineering applications through case studies. The third modules is an in-depth study of CAD/CAE systems combined with Additive Manufacturing technologies.

In the third semester, PS undertake, complete and submit the a Master's Dissertation (MScD), which is presented and examined by a three-member faculty committee.

Article 3: Number of Entrants, Criteria and Method of Selection

3.1 Number of Entrants

The maximum number of admissions to the MSc is set at sixty (60) per year and the minimum number of admissions is set at eight (8) per year. In the case of a tie, the number of admission to the MSc shall be increased in order to admit the last tied candidate.

3.2 Criteria and Method of Selection

I. Call for expression of interest

Candidates are informed by the call for expression of interest of the MSc, which is published on the websites of the MSc, the Department, the UNIWA and any other appropriate medium. The call for expressions of interest shall contain all relevant information (dates, place of submission of the application, necessary supporting documents to accompany it), as well as the criteria for evaluating the candidates' applications concerning the necessary supporting documents, the application procedure and the deadline for submission of applications.

The call for expressions of interest shall state:

1) the conditions for participation of MSc candidates in the selection process,

2) the categories of graduates and the number of applicants,

3) the selection procedure and criteria for the selection of MSc candidates,

4) the deadlines for submitting applications,

5) the supporting documents required,

6) any other detail deemed necessary to facilitate the selection process of the candidates for the selection of MSc students.

The applications and the required supporting documents shall be submitted to the MSc Secretariat, in paper or electronic form, within the deadline set in the call for expressions of interest and may be extended by decision of the Mechanical Engineering Department Assembly.

II. Candidate Evaluation Committee (CEC)

The selection of applicants is made by a three-member Candidate Evaluation Committee (CEC) which consists of faculty members of the Department of Mechanical Engineering.

The Committee has the following responsibilities:

i. Evaluation of all submitted supporting documents (the verification of the completeness of the supporting documents is carried out by the Secretariat of the MSc).
ii. verification of linguistic competence.
iii. conducting personal interviews.

The supporting documents for candidates are:

1. Application for admission to the MSc.
2. Copy of degree/diploma or certificate of completion of studies.
3. Academic Transcript.
4. A detailed curriculum vitae listing in detail the candidate’s qualifications and any research or professional activities.
5. Evidence of research or professional activity.
6. At least two (2) letters of recommendation.
7. Copy of additional qualifications (e.g. Master's degree).
8. Publications in peer-reviewed journals.
9. A two-sided copy of the identity card.

10. Copy of a certificate of English language proficiency. Proficiency is certified by a recognized qualification (e.g. a qualification from an educational institution in an English-speaking country or an English-language study Program, Advanced Certificate in English, TOEFL certificate with a score of at least 570 points, IELTS certificate with a score of 7.0 and above, State Certificate of Attainment in Languages (level C2)).
11. Additional qualifications, scholarships, special seminars, postgraduate degrees, supplementary education degrees, etc.

Graduates from English-speaking universities are exempted from the requirement to produce a language certificate. Knowledge of other foreign languages will be taken into account.

On completion of the evaluation procedures, the relevant CEC will draw up the list of successful and unsuccessful candidates in order of merit, according to the selection criteria and the weighting factors for each criterion. Successful candidates are those who have obtained a ranking in the order of merit up to the maximum number of students admitted. Candidates who have obtained a ranking in the order of merit above the maximum admission threshold are considered to be runners-up, with the right to enroll if the top-ranked candidates do not accept the place or do not enroll within the deadline.

In the event of a tie, all tied candidates will be admitted, provided that they do not exceed the maximum number of admissions set out in the call for expressions of interest. If the maximum number of admissions to the MSc is reached, the candidate with the highest degree will be admitted.

The final ranking of the candidates based on the list of criteria of the Program and the proposal for the selection of candidates based on this ranking are submitted to the Department Assembly for ratification.

III. Candidate selection criteria:

DESCRIPTION	**Weighting**
● Degree or diploma ● Grading in courses related to the academic subject of the PMS ● Diploma thesis, where this is provided for in the 1st study cycle	40%
Any writing and/or research activity of the candidate	10%
Research or professional experience of the candidate or documented employment in a relevant field or in a related subject	20%
Interview	30%
Total	100%

IV. Selection process

The required supporting documents must be submitted within the deadlines specified in the respective call for expressions of interest.
The MSc Secretariat receives the applications and the necessary supporting documents submitted by the MSc candidates, which are provided for in the call for expression of interest each time and compiles a list of MSc candidates, which it forwards to the CEC. The supporting documents

submitted by the candidates must have been submitted by the deadline, as provided for in the relevant call for expressions of interest. Late applications are not accepted.
The candidate evaluation process includes two stages:
In the first, applications are evaluated based on the completeness and validity of the required supporting documents submitted, which is a necessary condition for qualification to the next stage.
During the second stage of the process, the candidates are invited to an interview before the CEC. The aim is to establish which candidates are capable of effectively meeting the requirements of the MSc, taking into account motivation and interest, but also their overall composition and scientific competence in relation to the subject of the postgraduate Program.
Upon completion of the evaluation procedures, the CEC prepares a complete list of all candidates, ranks the candidates, makes the final selection and draws up the provisional list of successful candidates, which is validated by the DA. It is posted in accordance with the provisions on personal data protection, on the MSc website and in the announcements of the Department.
An objection against the provisional list of provisional students can be made within five (5) working days from the date of announcement of the lists. The objection must be specific and is finally judged by the Three-member Committee of faculty members of the Department who have undertaken a postgraduate project, which is defined by a decision of the DA.

After the expiry of the objection period and the final decision of the objection committee, the final list of provisional students is posted according to the procedure for posting the provisional list.
The successful candidates are invited to respond in writing or electronically (email) within five (5) days from the posting of the final table as defined in the call for expressions of interest to accept their inclusion in the MSc Program and its operating conditions, as described in this regulation operation.

If there are refusals, the Secretariat informs the next candidates in the evaluation order from the final list of successful applicants.

V. Registration in the MSc
Successful applicants must register at the MSc secretariat by the deadlines set by the competent bodies in the call for expressions of interest. For reasons of extreme necessity, it is possible to register a postgraduate student after the deadline by decision of the CC after a reasoned request of the interested party. The admitted PS can be updated from the website of the Department and/or from the MSc Secretariat. Categories of Candidates

Article 4: Categories of Candidates

In the MSc, graduates or diploma holders of Tertiary Education Institutions of the country or of similar Institutions abroad are accepted in accordance with the provisions of the current legislation. In particular, the MSc accepts, after selection, graduates or diploma holders of Departments of Technology and Sciences or graduates of other related Departments of Higher Education Institutions (HEIs) of the country or abroad, with proven knowledge of the English

language. Exceptionally, Graduates of other specialties who demonstrate an appropriate level of Technology knowledge may be accepted.
Final students of Departments can also submit an application, provided that they have presented the Certificate of Completion of their Studies before the date of validation of the list of successful candidates. In this case, a copy of their degree or diploma is provided before the start date of the Program.
Also, students of foreign Institutions which are not yet included in the National Register of Recognized Institutions abroad of the Interdisciplinary Organization for the Recognition of Academic Titles and Information (DOATAP) may also submit an application. In the event that a Foreign Foundation is not posted on the DOATAP website, the Department applies the procedure in accordance with what is defined in paragraph 4 of article 304 of Law 4957/2022.
Otherwise, the student will be deleted, without any claim from the student for a refund of the money that may have been deposited.
The competent Secretariat of the Department checks whether the institution awarding the title of a foreign institution belongs to the National Register of Recognized Institutions abroad and whether the type of this title belongs to the National Register of Types of Study Titles of Recognized Institutions posted on the DOATAP website.

Article 5: Duration of Studies - Suspension of Studies

5.1 Duration of Studies

The duration of studies leading to the award of the Master's degree is defined in four (4) academic semesters for part-time students and two (2) academic semesters for full-time students, which includes the time for the preparation of the MScD.

The maximum time allowed for the completion of studies is set at eight (8) academic semesters, following a reasoned application by the student and approval by the Department of Mechanical Engineering. At the end of the eighth academic semester and if the graduation obligations have not been fulfilled, the Departmental Assembly proceeds to withdrawal after a recommendation of the AC.

Η χρονική διάρκεια φοίτησης στο ΠΜΣ που οδηγεί στη λήψη Δ.Μ.Σ. ορίζεται σε τέσσερα (4) ακαδημαϊκά εξάμηνα για φοιτητές μερικής φοίτησης και δύο (2) ακαδημαϊκά εξάμηνα για πλήρους φοίτησης, στα οποία περιλαμβάνεται και ο χρόνος εκπόνησης της ΜΔΕ.

5.2 Suspension of Studies

The PS can reasoned request suspension of studies, which is granted by the AC for an entire academic semester. Regardless of the time of submission of the application, the suspension shall start from the beginning of the next academic semester. The semesters of student suspension do not count towards the maximum period of regular study. Suspension may not exceed two (2) semesters in total.

Article 6: Curriculum

The curriculum of the MSc is equivalent to ninety (90) ECTS credits. Each course corresponds to a specific number of credits. During their studies, the student is required:

a. to successfully complete a total of six (6) modules; and

b. to complete a Postgraduate Dissertation

The standard curriculum is as follows:

Co	Module Title	S	T	ECTS
M1-01	**Advanced Engineering Design (CAD/CAE)**	1	C	10
M1-02	**Quality Engineering & Project Management**	1	C	10
M1-03	**Robotics and Smart Manufacturing**	1	C	10
M1-04	**Additive and Subtractive Manufacturing & Reverse Engineering**	2	C	10
M1-05	**Dissertation**	3	C	30
	Total ECTS of compulsory modules			***70***
	Compulsory choice two modules (between M2-1,M2-2,M2-3)			
M2-01	**Mechatronic Design & Industrial Control**	2	O	10
M2-02	**AI - Applications in Engineering**	2	O	10
M2-03	**Advanced CAD/CAE Methods**	2	O	10
	Total ECTS of optional modules			***20***
	Overall ECTS Total			***90***

Key:

Co: Module Code S: Semester T:Module Type C:Compulsory O:Optional

Advanced Engineering Design (CAD/CAE)

1. GENERAL

SCHOOL	Engineering		
DEPARTMENT	Mechanical Engineering		
LEVEL OF STUDY	Postgraduate		
Course Unit Code	**M1-01**	**SEMESTER OF STUDY**	**1st**
Course Title	Advanced Engineering Design (CAD/CAE)		
Coursework **Breakdown**		**TEACHING WEEKLY HOURS**	**ECTS CREDITS**
Lectures and Seminars		3	10
Course Unit Type	Compulsory		
PREREQUISITES	No		
Language of Instruction/Exams:	English		

COURSE DELIVERED TO ERASMUS STUDENTS	No
Module web page (URL)	https://apedm.uniwa.gr/en/modules/ https://moodle.uniwa.gr/course/

2. Learning Outcomes

Learning Outcomes
Upon successful completion of the module, students will be able to: 1. Know the basic principles of operation of all types of modern 3D-CAD modelers and be able to select the appropriate one according to the required use. 2. Create complex three-dimensional solid models that include a variety of components and assemblies. 3. Develop a good understanding of various assembly techniques and the use of geometric assembly constraints. 4. Understand and apply finite element analysis (FEA) on structures to solve engineering design problems. 5. Comprehend ways of computational analysis of mechanical structures with analytical methods and the Finite Element Method, as well as the basic principles of operation of modern Computer Aided Engineering (CAE) systems. 6. Analyze and evaluate in depth the results of calculations 7. Understand the possibilities and range of information offered by modern software for solving problems by using Finite Element Method.
General Skills
• Develop a fundamental understanding of 3D solid modelling in the context of CAD-based design. • Develop an understanding of current and future supporting technologies for design and analysis in the context of engineering design. • To provide students with practical and theoretical knowledge of analytical tools that extend the functionality of Computer Aided Design (CAD). • To use CAE techniques to solve a range of engineering design problems and apply appropriate design techniques for a wide range of products. • Adaptation of understanding the methodology of design/modelling of mechanical components using CAD. • Decision-making on the modelling of components and assemblies. • Adapt understanding of the methodology of design and modelling, of mechanical components using CAE systems. • Calculation of mechanical components • Promotion of free, creative and inductive thinking • Independent work - Teamwork

3. Course Contents

- Principles of Engineering Design
- Principles of 3D CAD modelling
- Advanced 3D modelling features
- Assembly principles using geometrical constraints
- Technical drawings – Rules and strategies
- Product development process - Integration of CAD and CAE
- Structure analysis through Finite Element Method
- Physical problem transformation to Finite Element Analysis model
- Applications of Finite Element Modelling and Analysis in industrial case studies
- Analysis and evaluation of results

4. TEACHING METHODS - Assessment

Mode of DeliverY	Face-to-face, Distance learning
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Commercial /free/open-source software - Audio-visual material and multimedia applications- Moodle, E-class

TEACHING METHODS

Method description	***Semester Workload***
Lectures	40
Guided Pre-Reading	20
Assignments	70
Individual and group study, including work on specific software.	140
TOTAL	**270**

ASSESSMENT METHODS

Evaluation method	***Evaluation category***	***Weighting %***	***Learning outcomes***
Essay (3000 words) with Presentation and peer assessment "Modelling and Assembly of a complex product using CAD"	Group Assignment	50%	1, 2 & 3
Essay (3000 words) with Presentation and peer assessment "Analysis of Structures using Finite Element Method"	Group Assignment	50%	4, 5, 6 & 7

5. Resources

- Simmons C H and Maguire D E. (2012) Manual of engineering drawing, ISBN: 978-0080966526
- Singiresu S Rao. (2005), the Finite Element Method in Engineering, ISBN: 0 7506 7828 3
- Zeid, I. (2005) Mastering CAD/CAM, ISBN: 9780072976816.
- McMahon C & Browne J, CADCAM: Principles, Practice and Manufacturing Management, 2000, ISBN: 0201565021
- Faux, I.D. and Pratt, M.J. (1982) Computational Geometry for Design and Manufacture, ISBN: 978-0470270691
- Kuang-Hua Chang (2014). Product Design Modeling using CAD/CAE. ISBN: 978-0123985132

Quality Engineering & Project Management

1. GENERAL

SCHOOL	Engineering

DEPARTMENT	Mechanical Engineering		
LEVEL OF STUDY	Postgraduate		
Course Unit Code	**M1-02**	**SEMESTER OF STUDY**	**1st**
Course Title	Quality Engineering & Project Management		
Coursework **Breakdown**		**TEACHING WEEKLY HOURS**	**ECTS CREDITS**
Lectures and Seminars		3	10
Course Unit Type	Compulsory		
PREREQUISITES	No		
Language of Instruction/Exams:	English		
COURSE DELIVERED TO ERASMUS STUDENTS	No		
Module web page (URL)	https://apedm.uniwa.gr/en/modules/ https://moodle.uniwa.gr/course/		

2. Learning Outcomes

Learning Outcomes
Upon successful completion of the module, students will be able to: 1. Recognize the National, European and International authorities that are responsible and control quality issues in the field of mechanical engineering 2. Demonstrate knowledge of Quality Management Systems principles, ISO 9001 standards facilitating informed discussions on quality management concepts. 3. Utilise practical tools and techniques, like process management and strategic quality planning, enabling effective implementation of quality enhancement strategies within organisational processes. 4. Employ risk management strategies, fostering a process-driven mindset, and aligning quality objectives with strategic decision-making, thus promoting continuous quality enhancement within organisations. 5. Know and be able to use basic principles of project management 6. Be able to manage a project, develop its implementation and monitoring plan and develop and monitor its time and economic scheduling 7. Know the available software tools to fully support the manage and monitoring a project
General Skills
• Fundamental principles of TQM, including the ISO 9001 standards, allowing students to understand basic concepts of quality management. • Introduction to hands-on tools and techniques, such as process management and strategic quality planning, enabling students to enhance quality in organisational processes and contribute to continuous improvement • Development of basic quantitative tools applicable to Quality Management Systems • Search, analysis and integration of data and information, including the use of the necessary technologies • Adaptation to new scenarios • Decision-making • Autonomous work • Teamwork • Generating new research ideas • Project planning and management • Working in a multidisciplinary environment • Career development orientation

3. Course Contents

- Introduction to the concept of Quality.
- Presentation of modern quality control methods with special emphasis on the techniques of statistical quality control, quality acceptance testing, production process control and quality improvement in the design phase.
- Application of Failure Mode and Effects Analysis (FMEA) methodology.

- Fundamentals of Quality Management System, understanding the ways it affects an organization.
- In-depth understanding of ISO 9001 standards,
- Evaluation of different approaches to Quality Management Systems.
- Process Management and Identification of critical processes
- Strategic quality planning
- The art of informed decision making and effective risk management
- Models, methodologies and application tools in quality management
- The project concept and basic principles of project management
- The concept of the network. Project scheduling. The Critical Path Method (CPM) Examples - Applications.
- Project scheduling - Gantt chart.
- Basic project budget. Project cost analysis. Project duration reduction.
- Project management software tools.

4. TEACHING METHODS - Assessment

Mode of DeliverY	Face-to-face, Distance learning			
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Commercial /free/open-source software - Audio-visual material and multimedia applications- Moodle, E-class			
TEACHING METHODS	***Method description***		***Semester Workload***	
	Lectures		40	
	Guided Pre-Reading		20	
	Assignments		70	
	Individual and group study, including work on specific software.		140	
	TOTAL		**270**	
ASSESSMENT METHODS	***Evaluation method***	***Evaluation category***	***Weighting %***	***Learning outcomes***
	Essay (3000 words) with Presentation and peer assessment "Case study on Quality"	Group Assignment	50%	1, 2, 3 & 4
	Essay (3000 words) "Case study on Project Management"	Individual Assignment	30%	5, 6 & 7
	Examination "Written or online examination on module topics"	Written Examination	20%	1, 2, 3, 4, 5, 6 & 7

5. Resources

- Defeo, J.A. Juran's Quality Handbook: The complete guide to performance excellence, 7th ed. McGraw-Hill, 2016.
- George, M.L., Maxey, J., Rowlands, D. and Price, M. The lean six sigma pocket toolbook, 1st ed. McGraw-Hill, 2004.
- Shewhart, W.A. Statistical method from the viewpoint of quality control, 1st ed. Dover, 1986.
- Box, G.E.P., Hunter, W.G. and Hunter, J.S. Statistics for experimenters – design, innovation, and discovery, Wiley, 2005.
- Montgomery, D.C. Introduction to statistical quality control, 8th ed. Wiley, 2020.
- Taguchi, G., Chowdhury, S. and Wu, Y. Taguchi's quality engineering handbook, 1st ed. Wiley-Interscience, 2004.
- Deming, D.E. Out of crisis, MIT Press, 1982.

- Pyzdek, T., Keller, P. The Six Sigma handbook, McGraw-Hill, 2018.
- Crosby, P.B. Quality is free: The art of making quality certain, Mentor, 1980.
- Liker, J.K. The Toyota way: 14 management principles from the world's greatest manufacturer, McGraw-Hill, 2020.

Industrial Robotics and Smart Manufacturing

1. GENERAL

SCHOOL	Engineering			
DEPARTMENT	Mechanical Engineering			
LEVEL OF STUDY	Postgraduate			
Course Unit Code	**M1-03**	**SEMESTER OF STUDY**	**1st**	
Course Title	Industrial Robotics and Smart Manufacturing			
Coursework	**Breakdown**		**TEACHING WEEKLY HOURS**	**ECTS CREDITS**
Lectures and Seminars			3	10
Course Unit Type	Compulsory			
PREREQUISITES	No			
Language of Instruction/Exams:	English			
COURSE DELIVERED TO ERASMUS STUDENTS	No			
Module web page (URL)	https://apedm.uniwa.gr/en/modules/ https://moodle.uniwa.gr/course/			

2. Learning Outcomes

Learning Outcomes
Upon successful completion of the module, students will be able to: 1. Develop mechanical designs for robotic systems and analyze their operation in smart manufacturing environments. 2. Understand and design AGV systems, focusing on their mechanical components and role in automated production systems. 3. Apply advanced control strategies, including adaptive and predictive control, for the optimization of robotics and AGVs. 4. Design and evaluate robotic workflows in interconnected smart systems to enhance automation, flexibility, and productivity. 5. Utilize AI and data analytics to optimize the performance and adaptability of robotic systems in smart factories. 6. Recognise the fundamentals operational types of industry, identify the resources of production and be able to map the inputs and outputs of an industrial - production system in general 7. Apply production planning strategies
General Skills
• To provide a deep understanding of the design, dynamics, and control of industrial robots in the context of smart manufacturing. • To integrate Industry 4.0 principles relevant to mechanical systems, focusing on automation, robotic kinematics, and mechanical control strategies. • To enhance the knowledge of robotic mechanics, including joints, actuators, and control algorithms that optimize mechanical efficiency in smart factories. • To apply model-based control techniques and advanced robotic simulations to design intelligent mechanical systems for manufacturing automation • Decision-making on Industrial Robotic Systems • Adapting perception to AGV system design methodology • Design and management of production units and facilities • Working in a multidisciplinary environment • Promotion of free, creative and inductive thinking • Independent work - Teamwork

3. Course Contents

- Automation in Smart Manufacturing Systems - Introduction to Robotics in Industry 4.0 - Mechanical Design of Robotic Systems for Smart Manufacturing Systems - Robotic Kinematics and Motion Planning - Dynamic Modelling and Control of Robotic Systems

- Task Planning and Robotic Automation in Smart Manufacturing Mechanical task planning:
- Simulation and Optimization of Robotic Systems
- Introduction to AGVs in Smart Manufacturing
- AGV Navigation and Mechanical Design
- Task Planning and Coordination of AGVs
- Simulation and Optimization of AGV Systems
- AI and Machine Learning in Robotics
- Predictive Maintenance and Optimization in Smart Robotics
- Fundamentals of Production Management, The resources of production.
- Production Planning: Basic parameters in production planning, the problem hierarchy of production planning, Strategic planning, long and medium-term planning
- Production management and control systems

4. TEACHING METHODS - Assessment

Mode of DeliverY	Face-to-face, Distance learning
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Commercial /free/open-source software - Audio-visual material and multimedia applications- Moodle, E-class

TEACHING METHODS

Method description	***Semester Workload***
Lectures	40
Guided Pre-Reading	20
Assignments	70
Individual and group study, including work on specific software.	140
TOTAL	**270**

ASSESSMENT METHODS

Evaluation method	***Evaluation category***	***Weighting %***	***Learning outcomes***
Essay (3000 words) "Mechanical design and analysis tasks focusing on robot kinematics, dynamics, and control for smart manufacturing"	Individual Assignment	30%	1, 4 & 5
Essay (3000 words) with Presentation and peer assessment "Design a robotic system, focusing on mechanical efficiency and control optimization for automated manufacturing"	Group Assignment	50%	1, 2, 3, 4,5 ,6 & 7
Examination "Written or online	Written Examination	20%	1, 2, 3, 4,5 ,6 & 7

	examination on module topics"			

5. Resources

- A.Wasver, (2022), Robotics: Design, Construction and Applications, ISBN: 978-1647283377
- S.Y Nof, (1999), Handbook of Industrial Robotics, 2nd Edition, ISBN: 978-0-471-17783-8
- M.Soroush, M.Baldea, T.F.Edgar, (2020), Smart Manufacturing: Concepts and Methods, ISBN: 978-0128200278

Additive and Subtractive Manufacturing & Reverse Engineering

1. GENERAL

SCHOOL	Engineering		
DEPARTMENT	Mechanical Engineering		
LEVEL OF STUDY	Postgraduate		
Course Unit Code	**M1-04**	**SEMESTER OF STUDY**	**2nd**
Course Title	Additive and Subtractive Manufacturing & Reverse Engineering		
Coursework **Breakdown**		**TEACHING WEEKLY HOURS**	**ECTS CREDITS**
Lectures and Seminars		3	10
Course Unit Type	Compulsory		
PREREQUISITES	No		
Language of Instruction/Exams:	English		
COURSE DELIVERED TO ERASMUS STUDENTS	No		
Module web page (URL)	https://apedm.uniwa.gr/en/modules/ https://moodle.uniwa.gr/course/		

2. Learning Outcomes

Learning Outcomes
Upon successful completion of the module, students will be able to: 1. Organize state-of-the-art methodologies and tools, using the CAD model to produce the equivalent AM model, mesh cloud processing and surface modelling 2. Create AM models based on their manufacturability in additive manufacturing, aiming in improving their mechanical properties based on their use 3. Demonstrate good knowledge of additive manufacturing (AM) and its application to tool design and validation. Use of the department's state-of-the-art DED multimetal 3D printer, as well as our FDM/FFF/SLS/SLA technology printers. 4. Understand and apply additive machining principles, practices and tools for product research, development and evaluation 5. Critically analyze and optimize machining simulations using an industrial CAD/CAE/CAM package 6. Demonstrate a good understanding of metal removal methods on complex free-form surfaces using multi-axis CNC programming and post-processing. 7. Solve subtractive machining problems and apply methodologies to optimize cutting tool paths using CAM software 8. Understand and apply reverse engineering principles, practices and tools for product research, development and evaluation 9. Select and apply appropriate free-form surface modelling techniques from cloud data points derived from professional scanners (in our laboratories) for reverse engineering. 10. Analyze the social, economic and environmental impact on additive manufacturing and reverse engineering design.
General Skills
• Develop a fundamental understanding of additive and subtractive manufacturing technologies in the Industrial Manufacturing process. • Develop an understanding of current and future trends and developments in Industry. • To provide students with hands-on and theoretical knowledge of tools that extend the functionality of CAD. • To provide students with hands-on and theoretical knowledge of AM, CAM & RE tools and use corresponding techniques to solve a range of engineering design problems in Manufacturing. • Decision making • Teamwork • Exercise of criticism and self-criticism • Promotion of free, creative and deductive thinking • Demonstrate critical analysis in a concise, clear and objective manner • Formulating strategies for successful research using appropriate methods

3. Course Contents

- Definition and evolution of Additive Manufacturing.
- Overview of the seven processes in Additive Manufacturing according to ASTM F42 (VAT Photopolymerisation / Material Jetting / Binder Jetting / Material Extrusion / Powder Bed Fusion / Sheet Lamination / Directed Energy Deposition). Analysis of the individual technologies used, with reference to the benefits and limitations in their use.
- Materials and mechanical properties of parts manufactured by AM.
- Integrated process from CAD modelling, costing, to the optimal AM production process selection for a given application.
- Design for Additive Manufacturing-DfAM
- Commercial and research use of Additive Manufacturing technologies. Analysis of commercial systems in the field of additive manufacturing (Software & Hardware). Case studies. Future trends and developments.
- Numerical control of CNC machine tools and their integration in the industrial environment
- Machining simulation techniques for machining operations using CAM. Determination of tool geometry and machining operations (drilling, profiling, volume removal and multi-axis surface machining).
- Tool compensation, machine set-up and machining time optimisation.
- Machining toolpath data and numerical control (NC) code generation from CAD model geometry.
- Integrated machine simulation, verification and conflict avoidance.
- Introduction to reverse engineering design using 3D scanner operation to create curves, surfaces using point cloud.
- Additive manufacturing: Analysis and understanding of all current methods, materials used and their applications.
- Machining toolpath data and numerical control (NC) and program development based on a CAD model.
- Integrated machine simulation, verification and crash prevention.
- Introduction to reverse engineering design using 3D scanner operation to create curves, surfaces using point cloud.

4. TEACHING METHODS - Assessment

<table>
<tr><td>Mode of DeliverY</td><td colspan="4">Face-to-face, Distance learning</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</td><td colspan="4">Commercial /free/open-source software - Audio-visual material and multimedia applications- Moodle, E-class</td></tr>
<tr><td>TEACHING METHODS</td><td colspan="4"><table>
<tr><th>Method description</th><th>Semester Workload</th></tr>
<tr><td>Lectures</td><td>40</td></tr>
<tr><td>Guided Pre-Reading</td><td>20</td></tr>
<tr><td>Assignments</td><td>70</td></tr>
<tr><td>Individual and group study, including work on specific software.</td><td>140</td></tr>
<tr><td>TOTAL</td><td>270</td></tr>
</table></td></tr>
<tr><td>ASSESSMENT METHODS</td><td colspan="4"><table>
<tr><th>Evaluation method</th><th>Evaluation category</th><th>Weighting %</th><th>Learning outcomes</th></tr>
<tr><td>Essay (3000 words) with Presentation and peer assessment "Integrated reconstruction of components using RE technologies up to its manufacture</td><td>Group Assignment</td><td>50%</td><td>1, 2, 3, 4, 8, 9 & 10</td></tr>
</table></td></tr>
</table>

	using AM technologies"			
	Report (3000 words) with Presentation and peer assessment "Development and analysis of CAM models"	Group Assignment	30%	5, 6 & 7
	Examination "Written or online examination on module topics"	Written Examination	20%	1, 2, 3, 4, 5, 6, 7, 8, 9 & 10

5. Resources

- Fitzpatrick M, Machining and CNC technology, 2005, ISBN 0078250900.
- Schey J.A, Introduction to manufacturing processes, 2007, ISBN: 0311366000.
- McMahon C & Browne J, CADCAM: Principles, Practice and Manufacturing Management, 2000, ISBN: 0201565021
- Fuh J.Y.H, Computer-aided injection mould design and manufacture, 2004, ISBN: 0824753143.
- Ian Gibson , David Rosen , Brent Stucker , Mahyar Khorasani: Additive Manufacturing Technologies, 2021, ISBN: 978-3-030-56129-1
- Raja V., Fernandes K.J., Reverse Engineering: An Industrial Perspective, 2008, ISBN: 978-1-84996-660-3

Mechatronic Design & Industrial Control

1. GENERAL

SCHOOL	Engineering		
DEPARTMENT	Mechanical Engineering		
LEVEL OF STUDY	Postgraduate		
Course Unit Code	**M2-01**	**SEMESTER OF STUDY**	**2nd**
Course Title	Mechatronic Design & Industrial Control		
Coursework **Breakdown**		**TEACHING WEEKLY HOURS**	**ECTS CREDITS**
Lectures and Seminars		3	10
Course Unit Type	Optional Compulsory		
PREREQUISITES	No		
Language of Instruction/Exams:	English		
COURSE DELIVERED TO ERASMUS STUDENTS	No		
Module web page (URL)	https://apedm.uniwa.gr/en/modules/ https://moodle.uniwa.gr/course/		

2. Learning Outcomes

Learning Outcomes
Upon successful completion of the module, students will be able to: 1. Understand the topics of mechatronics through examples in mechatronics systems and their application in automation. 2. Identify, list and analyze the basic parts of a mechatronics system and its subsystems. 3. Articulate the form of a mechatronic system in the form of a structural diagram. 4. Use specialized software to analyze, simulate in real time and develop implementation of designed mechanisms. 5. Apply appropriate procedures to build dynamic models of robotic systems and design feedback control algorithms. 6. Understanding of PLC operation 7. Develop knowledge of PLC programming
General Skills
• Develop an understanding of the fundamentals of robotics, industrial inspection, automation and mechatronics systems, including mechanical design, sensors, actuators, computer vision, control strategies and software development. • Extend students' knowledge of analytical techniques for mechanism design and analysis with control design and optimization using advanced computer-aided methods. • Further develop the ability and skills in solving motion and control related problems. • Develop the knowledge required to integrate computer technology into a mechatronic product. • Ability to search, analyse and synthesise data and information, including the use of the necessary internet and literature research and networking technologies. • Ability to make decisions through the processing of solutions and through the processing of options for opposing tasks and exercises. • Ability to work independently through the development of individually executed tasks and exercises. • Ability to work in a team, through the performance of group work and exercises.

3. Course Contents

- Introduction to mechatronics and digital control
- Sensors and sensor interfacing, examples, industry related cases
- Actuators and actuator interfacing, examples, industry related cases
- Microcontroller structure and operation, operating system principles, examples
- Programming of microcontrollers for mechatronic integration: interfacing
- Real-time programming, multi-processing
- Device communication, UART, SPI, I2C, 1-Wire
- PLC hardware and operating system basics

- PLC programming languages - IEC61131

4. TEACHING METHODS - Assessment

Mode of DeliverY	Face-to-face, Distance learning
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Commercial /free/open-source software - Audio-visual material and multimedia applications- Moodle, E-class

TEACHING METHODS

Method description	***Semester Workload***
Lectures	40
Guided Pre-Reading	20
Assignments	70
Individual and group study, including work on specific software.	140
TOTAL	**270**

ASSESSMENT METHODS

Evaluation method	***Evaluation category***	***Weighting %***	***Learning outcomes***
Essay (3000 words) with Presentation and peer assessment "Design of a functional mechatronic system from concept to prototype"	Group Assignment	60%	1, 2, 3, 4 & 5
Essay (1500 words) "Case study analysis related to mechatronic applications"	Individual Assignment	40%	1, 2, 5, 6 & 7

5. Resources

- Craig, J. (2005). Introduction to robotics, ISBN: 9780131236295
- Negnevitsky, M. (2005), Artificial Intelligence: A Guide to Intelligent Systems, ISBN-10: 0321204662
- Wilkie, M. A. Johnson and M. R. Katebi, (2001), Control Engineering, Palgrave Publishers, ISBN 0-333-77129-X
- Ogata K. (2010), Modern Control Engineering, ISBN: 978-0136156734
- Dorf R. and Bishop, R. (2001) Modern Control Systems, ISBN: 978-0134407623

AI-Applications in Engineering

1. GENERAL

SCHOOL	Engineering		
DEPARTMENT	Mechanical Engineering		
LEVEL OF STUDY	Postgraduate		
Course Unit Code	**M2-02**	**SEMESTER OF STUDY**	**2nd**
Course Title	AI-Applications in Engineering		
Coursework **Breakdown**		**TEACHING WEEKLY HOURS**	**ECTS CREDITS**
Lectures and Seminars		3	10
Course Unit Type	Optional Compulsory		
PREREQUISITES	M1-03 Industrial Robotics and Smart Manufacturing		
Language of Instruction/Exams:	English		
COURSE DELIVERED TO ERASMUS STUDENTS	No		
Module web page (URL)	https://apedm.uniwa.gr/en/modules/ https://moodle.uniwa.gr/course/		

2. Learning Outcomes

Learning Outcomes
Upon successful completion of the module, students will be able to: 1. Understand fundamental AI concepts through the analysis of basic principles, algorithms and methodologies of artificial intelligence related to engineering applications. 2. Apply artificial intelligence techniques in the field of Engineering, using algorithms and AI tools to solve complex problems in the design and construction of mechanical structures. 3. Analyze and evaluate AI applications, taking into account factors such as accuracy, efficiency and scalability. 4. Develop innovative solutions that leverage AI technologies, such as smart robots or intelligent manufacturing systems. 5. Keep abreast of the latest trends, research and developments in AI and their possible applications in the field of Engineering
General Skills
• Develop a deep knowledge of the basic principles of artificial intelligence, such as machine learning algorithms and neural networks. • Explore and apply AI to engineering processes, such as product design. • Acquiring skills in AI-related tools • Encourage continuous learning and adaptation to new technologies and developments in the field of AI. • Decision-making • Teamwork • Exercising critical and self-critical thinking • Fostering free, creative and deductive thinking • Demonstrate critical analysis in a concise, clear and objective manner • Formulating strategies for successful research using appropriate methods • Develop an understanding of the fundamentals of robotics, industrial inspection, automation and mechatronics systems, including mechanical design, sensors, actuators, computer vision, control strategies and software development. • Extend students' knowledge of analytical techniques for mechanism design and analysis with control design and optimization using advanced computer-aided methods. • Further develop the ability and skills in solving motion and control related problems. • Develop the knowledge required to integrate computer technology into a mechatronic product. • Ability to search, analyse and synthesise data and information, including the use of the necessary internet and literature research and networking technologies. • Ability to make decisions through the processing of solutions and through the processing of options for opposing tasks and exercises.

- Ability to work independently through the development of individually executed tasks and exercises.
- Ability to work in a team, through the performance of group work and exercises.

3. Course Contents

- History and evolution of artificial intelligence
- Milestones in AI development Fundamental concepts, definitions and scope of AI Differences between AI, machine learning, and deep learning
- Programming basics, Introduction to AI programming languages, AI environments and development tools
- Deep learning and neural networks
- Artificial neural networks, Structure and function of neural networks
- Training and optimization techniques
- Neural networks (CNN, RNN) and applications
- Forecasting modeling in production processes
- AI applications in industry, CAD systems, Mechatronics etc. – Case studies

4. TEACHING METHODS - Assessment

Mode of DeliverY	Face-to-face, Distance learning
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Commercial /free/open-source software - Audio-visual material and multimedia applications- Moodle, E-class

TEACHING METHODS

Method description	***Semester Workload***
Lectures	40
Guided Pre-Reading	20
Assignments	70
Individual and group study, including work on specific software.	140
TOTAL	**270**

ASSESSMENT METHODS

Evaluation method	***Evaluation category***	***Weighting %***	***Learning outcomes***
Essay (3000 words) with Presentation and peer assessment "Design of a functional mechatronic system from concept to prototype"	Group Assignment	60%	1, 2, 3, 4 & 5
Essay (1500 words) "Case study analysis related to mechatronic applications"	Individual Assignment	40%	1, 2, 5, 6 & 7

5. Resources

- Craig, J. (2005). Introduction to robotics, ISBN: 9780131236295
- Negnevitsky, M. (2005), Artificial Intelligence: A Guide to Intelligent Systems, ISBN-10: 0321204662
- Wilkie, M. A. Johnson and M. R. Katebi, (2001), Control Engineering, Palgrave Publishers, ISBN 0-333-77129-X
- Ogata K. (2010), Modern Control Engineering, ISBN: 978-0136156734
- Dorf R. and Bishop, R. (2001) Modern Control Systems, ISBN: 978-0134407623

Advanced CAD/CAE Methods

1. GENERAL

SCHOOL	Engineering		
DEPARTMENT	Mechanical Engineering		
LEVEL OF STUDY	Postgraduate		
Course Unit Code	**M2-03**	**SEMESTER OF STUDY**	**2nd**
Course Title	Advanced CAD/CAE Methods		
Coursework **Breakdown**		**TEACHING WEEKLY HOURS**	**ECTS CREDITS**
Lectures and Seminars		3	10
Course Unit Type	Optional Compulsory		
PREREQUISITES	M1-01 Advanced Engineering Design (CAD/CAE) M1-04 Additive and Subtractive Manufacturing & Reverse Engineering		
Language of Instruction/Exams:	English		
COURSE DELIVERED TO ERASMUS STUDENTS	No		
Module web page (URL)	https://apedm.uniwa.gr/en/modules/ https://moodle.uniwa.gr/course/		

2. Learning Outcomes

Learning Outcomes
Upon successful completion of the module, students will be able to: 1. Know basic principles in automating CAD/CAE systems through the programming interface 2. Create integrated solutions for the improvement of engineering structures 3. Develop a good understanding of various programming techniques of modern CAD/CAE systems through the embedded programming interface. 4. Understand and apply the concepts of TO and GD methods to solve engineering design problems and their integration to manufacturing methods 5. Analyse and evaluate in depth the results of TO & GD calculations and solutions 6. Understands the capabilities and range of solutions offered by modern problem solving software using API, TO & DG tools 7. Select the most appropriate solution according to the problem they are required to solve in order to produce the optimal product
General Skills
• Develop an understanding of current and future trends in the use of GD, TO and CAD API technologies. • To provide students with practical and theoretical knowledge of tools that extend the automation of CAD systems. • To provide students with a practical and theoretical knowledge of GD and TO tools and use corresponding techniques to solve a range of engineering design problems in Industry. • Calculation of mechanical components • Theoretical knowledge related to the fields of API, TO & GD • Search, analysis and synthesis of data and information related to API, TO & GD applications • Practical ability to apply API, TO & GD tools • Promotion of free, creative and inductive thinking • Independent work - Teamwork

3. Course Contents

- Introduction to programming languages CAD systems and the use of the API. - Process automation in CAD systems - Extend automation by integrating CAD with other applications - Create integrated tools using CAD APIs - Understand the process and philosophy behind Generative Design. - Basic algorithms and application examples. - Analysis of real applications and designs created with Generative Design.

- Introduction to the basic concepts and objectives of Topology Optimization
- Acquaintance with the methods and mathematical models for Topology Optimization.
- Use of software and tools to implement topological optimization in CAD models.
- How AI technologies affect design and production.
- Modelling of parts based on their manufacturability (Design for Additive Manufacturing-DfAM).
- Exploring the impact of Generative Design and topological optimization on the contemporary industry.

4. TEACHING METHODS - Assessment

Mode of DeliverY	Face-to-face, Distance learning
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Commercial /free/open-source software - Audio-visual material and multimedia applications- Moodle, E-class

TEACHING METHODS

Method description	***Semester Workload***
Lectures	40
Guided Pre-Reading	20
Assignments	70
Individual and group study, including work on specific software.	140
TOTAL	**270**

ASSESSMENT METHODS

Evaluation method	***Evaluation category***	***Weighting %***	***Learning outcomes***
Essay (3000 words) with Presentation and peer assessment "Design and development of an integrated application for automation of CAD processes"	Group Assignment	50%	1, 2, 3 & 7
Essay (3000 words) with Presentation and peer assessment "Product improvement study using TO & GD technologies"	Group Assignment	50%	2, 4, 5, 6 & 7

5. Resources

- Benliang Zhu, Xianmin Zhang, 2018, Topology Optimization of Compliant Mechanisms, ISBN: 9789811304316
- Kouriatis N., 2021, GEOMETRIC PRINCIPLES IN GENERATIVE DESIGN, ISBN 978-960-418-844-4
- Sioshansi Ramteen, Conejo Antonio, 2017, Optimization in Engineering: Models and Algorithms, ISBN: 9783319567679

Dissertation

1. GENERAL

SCHOOL	Engineering		
DEPARTMENT	Mechanical Engineering		
LEVEL OF STUDY	Postgraduate		
Course Unit Code	**M1-05**	**SEMESTER OF STUDY**	**3rd**
Course Title	Dissertation		
Coursework **Breakdown**		**TEACHING WEEKLY HOURS**	**ECTS CREDITS**
Lectures and Seminars		2	30
Course Unit Type	Compulsory		
PREREQUISITES	No		
Language of Instruction/Exams:	English		
COURSE DELIVERED TO ERASMUS STUDENTS	No		
Module web page (URL)	https://apedm.uniwa.gr/en/modules/ https://moodle.uniwa.gr/course/		

2. Learning Outcomes

Learning Outcomes
Upon successful completion of the module, students will be able to: 1. Formulate a research problem, clearly articulating the objectives of the proposed research methodology, developing and clarifying a valid hypothesis 2. Conduct a thorough literature search in order to develop a comprehensive and sufficiently in-depth appreciation of the chosen research area 3. Demonstrate the ability to devise a sound methodology to advance the project in a systematic manner 4. Demonstrate the ability to apply the research results to relevant disciplines and problems. 5. Demonstrate critical analysis skills consistent with Master's level work and express hypotheses, analyses and conclusions in a clear, concise and objective manner. 6. Gain the ability to present project results in a concise, coherent and structured manner. 7. Acquire the ability to present the results of the project in a concise, coherent and structured manner.
General Skills
• Develop an understanding of the key elements and skills required to handle a complex project and how to break it down into smaller tasks for timely delivery. • Develop research skills and expertise in a specific area of engineering. • Conduct relevant research and literature review, experimentation and analysis to propose feasible solutions to specific industrial problems, identify the risks associated with a project and how to achieve defined objectives within resource constraints. • Developing project presentation and publicity skills through formal reporting, oral presentation and preparation of a scientific conference paper. • Synthesis of information from different sources. • Problem-solving skills in adapting research plans • Autonomous work - Group work • Decision making • Exercising criticism and self-criticism • Promoting free, creative and deductive thinking • Demonstrate critical analysis in a concise, clear and objective manner • Formulating strategies for successful research using appropriate methods

3. Course Contents

- Analysis of research methods.
- Planning research: contingencies and limitations.
- Presentation of research findings (written and oral) and assessment of its impact.
- Writing up research and document editing.

- Drawing conclusions and forming independent judgement.
- Research data analysis using qualitative and quantitative methods.
- Data identification and collection.
- Research strategy and design of a methodology.

4. TEACHING METHODS - Assessment

Mode of DeliverY	Face-to-face, Distance learning
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Commercial /free/open-source software - Audio-visual material and multimedia applications- Moodle, E-class

TEACHING METHODS

Method description	***Semester Workload***
Lectures	10
Supervision of work	20
Research, design, planning, programming, construction, testing, etc. and preparation of deliverables.	770
TOTAL	**800**

ASSESSMENT METHODS

Evaluation method	***Evaluation category***	***Weighting %***	***Learning outcomes***
Essay (1500 words) with presentation "Interim Report"	Individual Assignment	15%	1, 2, 3, 4, 6 & 7
Report (12.000-20.000 words) "Integrated Research and Solution Development in a field of the student's choice"	Individual Assignment	70%	1, 2, 3, 4 & 5
Presentation "Final Presentation of Dissertation"	Presentation	15%	1, 5, 6 & 7

5. Resources

- Jacqui Ewart , Kate Ames, (2021), Managing Your Academic Research Project, ISBN: 9789811591945
- Sharp, J.A., Peters J and Howard, K., (2012), The Management of A Student Research Project, ISBN: 9780566084904

Article 7: MSc Dissertation (MScD)

The PS is obliged to prepare and successfully support the MScD in the corresponding semester of studies referred to in this Internal Regulation. The subject of the MScD must be included in the scope of the Msc.

In particular, MScD drafting issues are defined by the MSc Regulation of MScD, which includes the following:

1. the educational purpose of MScD,

2. the stages of submitting the MScD,
3. the fields of research interest,
4. the stages of carrying out the MScD,
5. the procedure for changing the MScD title,
6. the good practices of writing the text and reading the MScD online or in print,
7. the study and finding of bibliographic sources,
8. the writing of research papers,
9. the MScD evaluation criteria,
10. the change of supervisor, etc.

Article 8: Organization of the MSc using synchronous and asynchronous distance learning methods

The educational process is organised through a combination of distance and in person (blended teaching and learning). The percentage of teaching hours delivered by means of modern distance learning will be in accordance with the provisions in effect.

All courses of the MSc and other educational activities may be carried out using " synchronous distance learning " if by their nature they do not involve practical, laboratory or clinical training of the students, for which the participation of the students in physical presence is required. 'Synchronous distance learning' is an educational method through technological means (videoconferencing environment) where the teacher and the students interact in a different place but at the same time with the possibility of two-way communication and real-time sharing of multimedia content (slides, videos, etc.).

The percentage of teaching using "Synchronous Distance Education" can be up to 100% of the credit hours of the MSc. For the needs of distance education will be used, the existing state-of-the-art electronic equipment, the MS TEAMS plstform and the eClass & moodle Electronic Classroom Management Systems of the University of West Attica. The MS-TEAMS system will be used for synchronous videoconferencing and virtual e-classroom sessions. The MS-TEAMS system supports:

- Visual and audio communication in real time using appropriate equipment (computer with camera, microphones, speakers, headphones) so that the instructor and students can have voice and visual communication while being in different rooms,
- application and document sharing
- electronic whiteboards sharing
- access to chat rooms both between teacher and students for collaborative exchange of views and joint work
- breakout sessions for the organisation of group activities.

The Electronic Class Management System of the University of West Attica is the central access point to all distance learning services. All modules of the MSc are hosted and their content is appropriately organized by the responsible professor per subject unit or lecture week and contains the slides, exercises, videos, tests, etc. as well as links to the corresponding synchronous distance learning

sessions of each module. Each module contains forums (for announcements to students by the teaching staff) and discussion & question solving forum in which all students can participate. Indicative tools provided to the lecturers through the eClass or moodle Electronic Classroom Management System are the following:

- Interactive content creation tools (H5P)
- Online quizzes
- Assignments (individual or group)
- Forums
- Chat
- Creation of collaborative websites (wikis)
- Blogs
- Questionnaires for data collection
- Calendar, gradebook, etc.

Article 9: Student assessment – Exams

At the beginning of each semester and before the start of the MSc courses, it is determined by a decision of the DA after a suggestion by CC and the academic calendar of the MSc is announced to the PSs. The MSc academic calendar lists the starting and ending dates of the semesters, holidays, as well as exam dates.

The CC draws up and announces in time the timetable of the examinations of each examination period no later than ten (10) days before the beginning of the examinations.

The evaluation of the students and their performance in the courses they are required to attend within the framework of the MSc is carried out by written or oral exams or by the preparation of assignments throughout the semester. The evaluation method is described in the outline of each course. The performance in each course is assessed by the lecturer(s) and graded using the applicable, for undergraduate students, grading scale. Specifically, the points given range from zero (0) to ten (10). Passing grades are five (5) and higher. In order to deal with emergency needs or circumstances resulting from force majeure, electronic means may be used for the evaluation of courses, provided that the integrity of the evaluation process is ensured.

The lecturers must take the required care for the examination of Students with Disability (SWD). Both SWD students and lecturers can contact the SWD Professors - Advisors of the Department.

Examinations for SWD are carried out in a climate of respect and acceptance of individuality.

In order for the PS to improve their performance, re-examination is possible in a single course, in which it has been successfully examined, in an examination period that includes the specific course.

If the student fails more than three (3) times in the same course, he may request, with his application to the Director of the MSc, to be evaluated by a three-member committee, which consists of teaching staff from the same or another Department of the UNIWA, with the same subject-knowledge or related to that of the subject to be examined, in which the professor of the subject cannot participate. If the Director of the MSc does not appoint the members of the committee within one (1) month from

the submission of the application, the student may request their appointment from the President of the Department.

Article 10: Student Rights and Obligations - Postgraduate Student Removal

10.1 Postgraduate Student Rights

PSs may use the existing infrastructure of the UNIWA which includes classrooms properly equipped with modern teaching aids and computers, the Library, and the facilities of the Department of Mechanical Engineering.

PSs who have no other medical and hospital care are entitled to full medical and hospital care in the National Health System (NHS) with coverage of the relevant costs by the National Health Service Provision Organization (EOPYY) pursuant to Article 33 of Law 4368 /2016 (A΄ 83), as amended and in force.

PSs are entitled to free meals based on their individual and family financial situation and their locality.

PSs can claim external funding of their studies from various Foundations or bodies of the public and private sector and Research Institutes.

PSs may be financially covered by funded research programs in which they participate. The relevant details are defined by a decision of the CC, after a proposal by the Director of the MSc.

PSs can participate in the student exchange programs (e.g. ERASMUS) of the University or in other research programs of foreign HEIs, within the framework of the Department's transnational agreements with similar institutions and enroll in them as guest students.

The Department of Mechanical Engineering is required to ensure mandatory accessibility to proposed programs and instruction or other accommodations for persons with disabilities and/or special educational needs. These facilities, in accordance with the applicable legislation, should be defined by the Department in detail (e.g. mode of examination, access to teaching areas, laboratories, etc.).

10.2 Obligations of Graduate Students

PSs have the following obligations:

- To attend the courses of the current curriculum without interruption.
- Submit the required assignments within the specified deadlines.
- Attend the prescribed examinations.
- Declare responsibly that the MScTh is not the product of plagiarism, either in whole or in part.
- Pay the prescribed fees as specified in the Internal Regulations of the MSc.
- Respect and comply with the Regulations of Postgraduate Studies, the decisions of the bodies of the MSc, of the Department and of the UNIWA, as well as respect and comply with the academic ethics.

They are required to participate and attend seminars, discussions, conferences/meetings with a subject related to the MSc, lectures or any other scientific event of the MSc. The PSs may perform adjunct teaching duties in first cycle Programs of study by decision of the competent body of the MSc. PSs shall issue an academic identity card through the Electronic Service for Acquiring Academic Identity of the Ministry of Education and Religious Affairs.

10.3 Postgraduate Student Deregistration

The deregistration of a PS is made after a relevant recommendation of the CC of the MSc to the DA and a relevant decision is taken. The decision shall be notified within 15 days to the PS concerned, and he/she shall have the right to submit an appeal within fifteen (15) days from the date of its issuance. The appeal shall be finally decided by the above-mentioned bodies.

The DA, following the recommendation of the CC, may decide to delete a PS on the following grounds:

1. Faulty fulfillment of the obligations of the PS, as described in the Internal Regulations of the UNIWA.
2. Failure to pay the prescribed tuition fees (in any case, a student who has not met his/her financial obligations is not entitled to receive either a certificate of completion of studies or the MSc).
3. Disciplinary misconduct, such as violation of academic ethics and, in general, any violation of the applicable legislation and the Internal Regulations of the UNIWA.
4. Request for deletion of the PS himself.
5. Has repeatedly failed the examination of a course or courses as specified in the Internal Regulations.
6. Has not renewed his enrollment or has not attended classes for two (2) consecutive semesters.
7. Has committed the offence of plagiarism or an offence falling under the law on intellectual property (Law 2121/1993).
8. For any other reason deemed necessary.

In case of permanent discontinuation of studies or deregistration of a PS for any reason, the fees already paid will not be refunded.

Article 11: Tuition fees

The tuition fees of the MSc, in total for each student, are four thousand euros (€4,000). The tuition fees may be differentiated between foreign students from other member states of the European Union and foreign students from third countries (Law 5094 /2024) and will be decided annually by the Coordinating Committee of the MSc, which will be indicated in the Call for Expression of Interest of the academic year of admission in question. In case of application and acceptance of Postgraduate Students, more than two months before the deadline for submission of applications each year, a reduction of the tuition fees by five hundred euros (€500) will be granted. Payment of tuition fees shall be made in four equal instalments of one thousand euros (€1,000), upon enrolment and at the end of each semester of study. In the event of withdrawal, the fees paid will not be refunded. Tuition fees are paid to the Special Research Funding Account of the University of West Attica, which is responsible for their management. Postgraduate students must pay all their financial obligations on time and must have paid all their financial obligations before the issue of the certificate of completion of studies and the award of the Master's degree. In case of exceeding the maximum time limit of study (including extension of studies) and consequently, following a decision of the Coordinating Committee, Postgraduate Students may re-enrol and continue their studies for a maximum period of two (2) semesters. In this case, the payment of additional tuition fees, amounting to five hundred euros (€500) per semester, is foreseen, without the right to receive a scholarship. In case of non-

compliance with their financial obligations, it is possible, following a decision of the Coordinating Committee, to temporarily suspend or withdraw the Postgraduate Students from the Programme.

Article 12: Master's Degree (MSc Award Certificate-MScAC)

The MScAC is a public document. The graduate of the MSc may be granted, before the award, a certificate of successful completion of the MSc and an analytical grade with the corresponding credit units (ECTS).

A Diploma Supplement is attached to the MSc, which is an explanatory document and does not replace the official degree or the detailed course evaluation. The Diploma Supplement is attached to the MScAC and provides information on the nature, level, general context, content and status of the studies successfully completed by the person named on the original of the diploma. The Annex does not make any evaluative judgements and there are no statements of equivalence or equivalence or proposals for the recognition of the MSc abroad. The Diploma Supplement is issued automatically and without any financial charge in Greek and in English, and must meet the authenticity requirements for the degree awarded. The date of issue of the Diploma Supplement does not necessarily coincide with the date of award of the degree, but can never be earlier than that date.

The grade of the MSc is calculated based on the grades of the courses and the MSc Dissertation.

More specifically, in each semester the student receives a grade in each course examined and if successfully assessed, is credited proportionally with the corresponding credits. The final grade of the MSc is derived from the assessment grade:

a) in the courses,

b) in the MSc dissertation

The grade of the MSc shall be obtained to two decimal places using the formula:

$$B=(B1*П1+B2*П2+……..+Bv*Пv)/(П1+П2+…..Пv)$$

where B1,B2....Bv are the grades of all courses that the MF has successfully taken and П1,П2....Пv are the credit units corresponding to each course.
Upgradable grades are five (5) and higher. The rating scale for evaluating the performance of the PSs is defined from zero (0) to ten (10) as follows:

- **Excellent**: from eight and fifty (8.50) to ten (10),
- **Very Good**: from six and fifty (6.50) to eight and forty-nine (8.49),
- **Well**: from five (5) to six and forty-nine (6.49) or
- **It is rejected**: from zero (0) to four and ninety-nine (4.99).

Article 13: Teaching Staff of MS Program

The teaching work of the MSc is assigned, following a decision of the CC, to the following categories of professors:

1. Members of the Department or other Departments of the UNIWA or other HEIs or Military HEIs, with additional employment beyond their legal obligations,
2. Emeritus Professors or retired faculty members of the Department or other Departments of the UNIWA or of other HEIs,
3. Associate professors,
4. Appointed lecturers,
5. Visiting professors or visiting researchers,
6. Researchers and special functional scientists of research and technological institutions of article 13A of Law No. 4310/2014 (A' 258) or other research centers and institutes of the country or abroad,
7. Scientists of recognized prestige, who have specialized knowledge and relevant experience in the subject of the MSc.

The assignment of the teaching work of the MSc is carried out by decision of the competent body, following the recommendation of the CC, if it exists, otherwise by the Director of the MSc or the Curriculum Committee of Studies (CCS) may assign ancillary teaching work to doctoral candidates of the Department or the Faculty, with a subject related to the provided ancillary teaching work of the MSc, under the supervision of a lecturer of the MSc, upon recommendation of the CC.

The right to supervise the Dissertation is held by the lecturers of the categories (α) to (στ) of paragraph 1, provided that they hold a doctoral degree. By the decision of the competent body of the MSc, the supervision of dissertations may be assigned to faculty members of the Department who have not undertaken teaching work in the MSc.

All categories of lecturers may be remunerated exclusively from the resources of the MSc. No remuneration or other benefits may be paid from the state budget or the public investment Program. The decision of the competent body of the MSc to award the teaching assignment shall determine the amount of the remuneration of each lecturer. In particular, lecturers who have the status of faculty members may be paid additionally for work they provide to the MSc, provided that they fulfil their minimum legal obligations as defined in par. 2 of article 155 of Law 4957/2022. The last subparagraph shall apply mutatis mutandis to the members of the ERC, the HQA and the HPEE, provided that they fulfil their minimum legal obligations.

The obligations of the lecturers include, among others, the definition and description of the course, the provision of relevant bibliography, the definition of the way of examining the course, the communication with the postgraduate students.

The MSc may, by decision of the CC and/or the CCS, apply the institution of the Academic Advisor.

The purpose of this institution is to provide advice to postgraduate students during their studies on academic issues in an individualized manner. The expected result is to facilitate postgraduate students in completing their studies while at the same time utilizing their particular skills and interests in the educational and research process. The Academic Advisor chooses how to approach and advise the students assigned to him/her in each academic year.

Article 14: Auxiliary teaching project of postgraduate students

By decision of the DA or the CCS of the MSc, it is possible to approve the participation of postgraduate students, doctoral candidates and postdoctoral fellows in the provision of supplementary teaching work in first or second cycle study programs.

The UNIWA may grant remunerative scholarships to postgraduate students with the obligation to support the educational process and provide auxiliary teaching work.

Auxiliary teaching work is defined as assisting the members of the Teaching and Research Staff in the exercise of their teaching duties, training students, conducting tutorials, laboratory exercises, supervising examinations and correcting exercises.

Article 15: Feasibility-Viability analysis

The present feasibility analysis aims in evaluating the conditions and prospects for the foundation of a new Postgraduate Programme in the field of Industrial Production Systems, within the Department of Mechanical Engineering, School of Engineering, University of West Attica.

1. Necessity of the establishment of the MSc and description of its objectives

The objective of the Postgraduate Studies Programme (MSc) is the postgraduate teaching, research and application of methods on state-of-the-art technologies in topics of Industrial Product Design, in combination with Manufacturing Management. During the start-up, emphasis will be placed on the disciplines that are on a significant rise in the current period in the field of Engineering, such as Additive and Subtractive Manufacturing, Artificial Intelligence-AI, New Construction Materials, Reverse Engineering-RE, Mechatronics and Robotics.

The aim of the MSc, which is addressed to graduates of Higher Education, is to integrate modern methods in the field of manufacturing technology with production. It offers specialization in the field of Industrial Production Systems, aiming to:

- equip engineers with the necessary skills to use modern methods in the manufacturing industry
- to enhance the rational and effective approach to modern issues of Industrial Production
- to develop and expand the managerial competencies of engineers for professional success in the private, public and academic sectors in the field of the XMPS.

The MSc implements a combination of immersion in the subject of engineering in cutting-edge technologies (CAD/CAM/CAE, Additive Manufacturing, Artificial Intelligence, Reverse engineering, Robotics, Mechatronics, New Materials for Construction) that is complemented by courses in Quality Management and Production Line Optimization, Modern Methods of Product and Production Research and Development.

By completing the MSc students will be able to:

- deepen their knowledge in specialized fields of Mechanical Engineering in order to promote knowledge, the development of research and the arts, as well as the satisfaction of the educational, research, social, cultural and developmental needs of the country,
- expand and develop harmonious partnerships at the educational, research and, by extension, working level
- to analyse problems, synthesise solutions and evaluate comparatively alternative approaches in specialised fields of the engineering discipline,

- develop problem-solving skills and the ability to apply these skills to developing innovative solutions for the practical needs of society.
- analyse problems, synthesise solutions and comparatively evaluate alternative approaches,
- have developed and actively demonstrate an awareness of the ethics and norms of research, of the individual, social, economic and environmental dimensions and consequences of its results, and to discern the open questions and challenges involved,
- describe and present in a correct, accurate and complete manner their work and its results, in an individual or group context and in an oral, written or other supervisory manner or medium,
- be inspired to produce and apply new theories and new methodological approaches
- to develop their research interests in order to continue their studies in the third cycle of doctoral studies in specialised fields within the discipline of Engineering.

The program is structured to provide students with knowledge of cutting-edge technologies, while enhancing their learning experience by providing hands-on training on the latest applications across the entire product development cycle. The program covers a wide range of topics from 3D solid modelling and the techniques required to develop the customisable capabilities of a CAD system using it as a product development platform, to gaining practical and theoretical knowledge of analytical computing tools using Finite Element Analysis (FEA) techniques. It also looks at the importance of modern materials in advanced manufacturing processes, as well as computer aided manufacturing (CAM) and the application of Additive Manufacturing technologies. The combination of the above with Mechatronics, Robotics and knowledge in the field of Artificial Intelligence with its practical applications in the field of Engineering, allows students to acquire the entrepreneurial, managerial and professional skills necessary to take on leadership roles in large engineering design, development and product manufacturing projects.

The curriculum is offered in three (3) academic semesters. The modules, consisting of compulsory and optional modules, are delivered in three-hour lectures of total 40 hours/module. Courses, examinations and all other educational and research activities are conducted in English.

Students are required to carry out their Dissertation on topics of theoretical or applied research relevant to the subject of their thesis or on topics in which they wish to go into greater depth with the cooperation of the supervising professor, who is responsible for the level of the thesis topic.

2. Market and Needs Analysis

Scientific and technological developments

The latest technological developments in the field of Engineering have led to an increased demand worldwide for qualified professionals and researchers with a level of cutting-edge technology knowledge and corresponding skills. The operation of the MSc aims to scientifically cover and deepen the current knowledge of the engineering manufacturer, with the aim of product development:

- CAD/CAM/CAE
- Additive Manufacturing
- Artificial Intelligence
- Reverse engineering
- Mechatronics Design
- Industrial Robotics

- New Construction Materials
- Quality Management and Production Line Optimisation
- Modern Methods of Research and Development of Products and Production

Labour market needs

Mainly through discussions with industry professionals, it was found that there is a significant need for skilled personnel with postgraduate knowledge in the area of integrated product development using modern research and production methods. This position is reinforced by the successful 22-year track record of a similarly targeted MSc, offered in partnership between PADA and Kingston University London. The present proposal is an update of the above MSc following the expiry of the interdisciplinary agreement with the British university and the inability to renew it due to the consequences of Brexit.

Industries are applying innovative technologies such as CAD/CAM/CAE for advanced design and manufacturing processes, enabling more efficient and accurate product development. Additive manufacturing is revolutionising production, enabling complex geometry and customised products, while artificial intelligence is enhancing decision-making and automating complex tasks in engineering systems.

Reverse engineering is becoming essential for analysing and improving existing products, promoting innovation and competitive advantage. Mechatronic systems design and industrial robotics are at the forefront of automation, improving efficiency and productivity in production processes. The development of new building materials opens up opportunities to create stronger, lighter and more sustainable products, meeting the evolving demands of various industries.

Quality management and production line optimization are critical to maintaining high standards and production efficiency, ensuring that products meet customer expectations and regulatory requirements. Modern research and development methods are essential for continuous innovation, allowing engineers to explore new ideas and technologies that drive progress.

The specialised courses of the MSc in the above-mentioned subjects prepare professionals to meet the challenges of today's industries moving to cutting-edge technologies. This specialized training is vital to develop the expertise needed to drive innovation, improve products and processes, and contribute significantly to the advancement of engineering on a global scale.

3. Budget

The budget of the IMMS is planned to remain the same for the five-year period from the Academic Year 2024-2025 to 2028-2029. As for the expenses, the categories of operating expenses and the corresponding amounts-expected outputs are indicated in accordance with para. 4 of article 37 of Law No. 4485/2017 and the Ministerial Decision No. 216772/8.12.2017 (Β΄/4334) on "How to prepare the detailed operating budget and the sustainability report of the Postgraduate Studies Programmes".

For the preparation of Table B.1.2, it has been taken into account, as stipulated in Article 4 of Law No. 4485/2017 and the Ministry of Education 216772/8.12.2017 Β΄/4334. The revenue of the MSc is administered by the LRC and is allocated seventy percent (70%) to cover the operating costs of the programme and thirty (30%) to cover the operating costs of the Institution, with priority given to meeting the needs of the MSc's that operate without tuition fees.

It is noted that:

- Compensation expenses for regular teaching, technical and administrative staff of the Foundation are for work that exceeds their statutory obligations.
- The Foundation's operating costs have been calculated based on the maximum number of students admitted to the MSc per year and for a total of four thousand eight hundred euros (€4,000) per postgraduate student.

S/N	**Income - funding**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**	**2028-2029**
1	Tuition fees	€42.000	€168.000	€168.000	€168.000	€168.000
2	Donations, sponsorships and financial aid of all kinds	-	-	-	-	-
3	Bequests	-	-	-	-	-
4	Funds from research projects or programmes	-	-	-	-	-
5	UniWA resources	-	-	-	-	-
6	State budget or Public Investment Programme	-	-	-	-	-
Total		€42.000	€168.000	€168.000	€168.000	€168.000

S/N	**Έξοδα - κατηγορίες δαπανών**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**	**2028-2029**
1	Fees for administrative - technical support	€5.000	€20.000	€20.000	€20.000	€20.000
2	Fees for teaching staff	€20.400	€82.600	€82.600	€82.600	€82.600
3	Travel expenses	€500	€5.000	€5.000	€5.000	€5.000
4	Expenditure on equipment and infrastructure	€2.500	€5.000	€5.000	€5.000	€5.000
5	Expenditure on the award of scholarships	-	-	-	-	-
6	Other operating expenditure	€1.000	€5.000	€5.000	€5.000	€5.000
	Partial Total	€29.400	€117.600	€117.600	€117.600	€117.600
7	UniWA Operating expenses (30%) Special Account for Research Grants (SARG)	€12.600	€50.400	€50.400	€50.400	€50.400
Total		€42.000	€ 168.000	€ 168.000	€ 168.000	€ 168.000

Article 16: Funding- Financial Management of the P.M.S.

The program is funded by:

a) tuition fees.

b) donations, sponsorships and financial aid of any kind

c) legacies

d) funds from research projects or programmes

e) internal funding of the University of West Attica and

f) the state budget or the public investment program

The payment of the tuition fees is made by the student himself or by a third physical or legal person on behalf of the student.

The funds of the MSc are administered by the Special Account for Research Grands of the University of West Attica

The resources of the MSc are allocated as follows:

1. An amount corresponding to thirty percent (30%) of the total revenue from tuition fees is retained by the Special Account for Research Grants (SARG). This amount includes the percentage of the retention in favour of SARG for the financial management of the program. The revenue of the program of paragraphs b) to d) of the paragraph. 1 shall be subject to the same rate of deduction in favour of the Hellenic Republic as is applicable to revenue from the corresponding funding sources.
2. the remaining amount of the total revenue of the program (70%) shall be allocated to cover the operating costs of the MTF

Revenue budgeting methodology:

As for the revenues, the funding sources according to paragraphs 1 and 2 the article 84 of Law 4957/2022 and the corresponding amounts - expected inflows from each funding source are indicated.

Methodology for drawing up revenue budgets:

They are indicated in the budget of a full cycle of the MSc for the enrolled students of the given year.

The categories of operating costs and the corresponding amounts - expected outputs are indicated.

Income

Income-Funding		
1	Tuition fees	€ 168.000
2	Donations, sponsorships and financial aid of all kinds	-
3	Bequests	-
4	Funds from research projects or programmes	-
5	UniWA resources	-
6	State budget or Public Investment Programme	-
Total		**€ 168.000**

Expenses

Expense - categories of expenditure		
1	Fees for administrative - technical support	€ 20.000
2	Fees for teaching staff	€ 82.600
3	Travel expenses	€ 5.000
4	Expenditure on equipment and infrastructure	€ 5.000
5	Expenditure on the award of scholarships	-
6	Other operating expenditure	€ 5.000

Partial Total (70%)		**€ 117.600**
7	UniWA Operating expenses (30%) Special Account for Research Grants	€ 50.400
Total		**€ 168.000**

According to par. 2 of Article 85, of Law No. 4957/2022, a two percent (2%) is set as the maximum of the total annual revenues of the MSc that can be allocated to the project/program of par. 1 of the same article.

Article 17: Plagiarism

The postgraduate student is required to report in an appropriate manner if he/she has used the work and opinions of others. In addition, postgraduate students who have used the services and assistance of Artificial Intelligence (AI), in the preparation of work assigned to them within the framework of the MSc and/or Dissertation, should include in the introduction a "Statement on the use of generative AI and AI-assisted technologies in the writing process", stating which tool they have used and for what purpose.

Plagiarism is considered a serious academic offence. Plagiarism is the copying of someone else's work, as well as the use of someone else's work - published or not - without proper citation. The copying of any documentary material, even from the candidate's own studies, without proper reference, may lead to a decision by the Department to expel the candidate. In the above cases, the Department may decide to remove the candidate after he/she has been given the opportunity to express his/her views on the matter, either orally or in writing.

Any offence or breach of academic ethics shall be referred to the Department to address the problem. Offences of copying or plagiarism and, in general, any violation of the provisions on intellectual property by a postgraduate student when writing coursework or preparing a thesis are also considered as offences.

Article 18: Awarding of degrees - oaths

The PS who has successfully completed his/her postgraduate studies is sworn in at a public swearing-in ceremony, before the Rector or the Vice Rector as the 21

representative of the Rector and the President of the Department, which takes place after the end of each examination period, at a date and time determined by the Rector in collaboration with the Presidents of the Departments. The oath is not a component of successful completion of studies, but it is a necessary condition for the award of the degree. For reasons of force majeure (e.g. health reasons, residence or work abroad, military obligations) and with a request to the Secretariat of his/her Department, the graduate may request the award of the degree without participating in the swearing-in ceremony or request to participate in a subsequent swearing-in ceremony. Exemption from the requirement to attend a swearing-in ceremony shall be approved by the Chair of the Department. Prior to the swearing-in ceremony or exemption from it, graduates may be given a certificate of successful completion of their studies.

A degree awarded may be revoked or canceled if it is shown that the legal and institutional conditions for its award did not exist at the time it was awarded. The revocation or annulment is made following a decision of the DA, which is communicated to the Rector of the institution.

Article 19: MSc Website

The MSc has its website in Greek and English. The official website of the MSc is constantly updated and contains all the information and announcements of the programme and is the official information point for students.

Article 20: MSc Evaluation

At the end of each semester an evaluation of each module and instructor is carried out by the postgraduate students. The evaluation is done using a dedicated evaluation form/questionnaire completed by the graduate students. Modules are evaluated in regard to content, teaching style, teaching material and the degree of their relevance to the principles and philosophy of the postgraduate programme. Faculty members are evaluated at several levels, which may include, but are not limited to, evaluation of their knowledge and ability to deliver it to students, their preparation, use of up-to-date literature, willingness to answer questions, timely grading and feedback of assignments and written examinations, and meeting course teaching hours.

The annual internal evaluation of the MSc is carried out in cooperation with the Quality Assurance Unit (MODIP) of the University of West Attica in the scope of the internal evaluation of the Mechanical Engineering Department/Faculty of Engineering and in accordance with the corresponding process of the internal Quality Assurance System of the UniWA.

The external evaluation of the MSc is carried out in cooperation with the MODIP in the framework of their accreditation according to the procedure provided by the Hellenic Authority for Higher Education (HAHE).

In this context, the overall evaluation of the work performed by the MSc, the degree of fulfilment of the initial objectives , its sustainability, the absorption of graduates in the employment market, the degree of its contribution to research, its internal evaluation by postgraduate students, the feasibility of extending its operation, as well as other data on the quality of the work produced and its contribution to the national strategy for higher education.

Article 21: Other Provisions

Any matter that arises in the future that is not covered by the relevant legislation or this Regulation, will be dealt with by decisions of the competent bodies and where necessary by amending the Regulation.