

ECTS Information Package: Degree Programme

Mast

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# A - General Description

**Programme Title** - Mestrado em Engenharia Mecânica - Projecto e Produção Mecânica

**Qualification awarded** - Master

**Level of qualification** - VII

## Specific admission requirements

### General

According to the Portuguese Law, the following candidates are eligible for entry to the course of study leading to the *Mestre* degree:

- Holders of a *licenciado* degree or legally equivalent corresponding to the first cycle of higher education;
- Holders of a foreign higher degree awarded on completion of a first-cycle programme organised in the framework of the Bologna Process;
- Holders of a foreign higher degree which is deemed by the Technical-Scientific Committee of ESTT-IPT to meet the requirements of a *licenciado* degree.
- Holders of an academic, scientific or professional curriculum which is deemed by the Technical/Scientific Committee of ESTA-IPT as appropriate to access the programme.

### Specific

To be qualified for entry in a programme leading to the master's degree applicants must fulfil the following requirements:

- a) Hold a higher degree or legally equivalent qualification in Mechanical Engineering or related areas;
- b) Hold a foreign higher degree in one of the abovementioned areas awarded upon completion of a first-cycle programme from a foreign country engaged with the Bologna Process in Mechanical Engineering or related areas;
- c) Hold a foreign higher degree recognised by the Committee for the Recognition of Foreign Academic Qualifications in Mechanical Engineering or related areas.

## **Specific arrangements for recognition of prior learning (formal, non-formal and informal)**

### General

Granting of credits from prior learning is regulated by the Portuguese Law taking into account the level of credits and the field of study where they have been earned and is subject to the recognition of ESTA-IPT Technical/Scientific Committee.

- Training undertaken in the context of other higher education programmes of study from national or foreign HE establishments or organised in the framework of the Bologna Process or other prior learning can be credited towards the present programme of study;
- Credits earned from postgraduate studies can also be credited towards this programme of study;
- Professional experience or other training, different from the abovementioned ones, can also be credited towards this programme of study.

### Specific

Accreditation of prior learning from candidates holding a licenciado degree in mechanical engineering or similar degrees taken prior to the Bologna reform with a duration equivalent to 300 ECTS credits (5 years of study) is formally analysed on a case-to-case basis.

## **Qualification requirements and regulations:**

The master's degree in Mechanical Engineering - Mechanical Project and Production are governed by the Portuguese Law and applicable programme regulations set out by the Abrantes School of Technology (ESTA).

In order to complete the master's degree it is necessary to accumulate 120 ECTS credits distributed throughout 4 curricular semesters as according to the course curriculum.

One ECTS credit corresponds to a 27-hour workload.

## **Profile of the program:**

The general aims of this master's degree are to equip the students with the relevant skills and competences in such areas as product development methodologies, processing technologies, material technologies, mechanical behaviour of materials and process automation and control.

Main specific skills:

- Develop a mechanical project throughout its various stages;
- Carry out computer analyses that enable problem analysis and resolution;
- Apply experimental methods for problem analysis and resolution;
- Predict and identify possible causes of failure in mechanical systems;
- Design and manufacture products and equipment using new and traditional technologies;
- Be able to gather useful information by exploring engineering databases;
- Contact with experts of different areas of knowledge.

**Key learning outcomes:**

The master's degree in Mechanical Engineering - Mechanical Project and Production aims to equip students with relevant skills and competences in such areas as product development methodologies, processing technologies, material technologies, mechanical behaviour of materials and process automation and control according to the provisions of Decree-Law No74/2006 dated 24 March et seq.

**Occupational profiles of graduates with examples:**

Holders of the Master's Degree in Mechanical Engineering - Mechanical Project and Production will be able to serve as:

- Directors;
- Project Managers/Leaders,
- Engineers in a wide range of departments in areas such as project, production, planning, testing, research, development, etc.

They will also be able to serve as Engineers/Technicians in a wide range of areas:

- Consultancy;
- Building;
- Automation;
- Energetic Systems;
- Renewable Energies;
- etc.

**Access to further studies:**

Not applicable

### Course structure diagram with credits

Course Title	Year	Semester	Credits
Composite Materials	1	S1	6
Mechanical Vibrations	1	S1	6
Metal Forming	1	S1	6
Numerical Simulation	1	S1	6
Surface Engineering	1	S1	6
Energy Management and Thermal Systems	1	S2	6
Equipment Design and Development	1	S2	6
Fracture Mechanics	1	S2	6
Industrial Robotics	1	S2	6
Production Management	1	S2	6
(optional) (*)	2	A	54
Seminar	2	S1	6

(\*) This course may not be available in certain academic years. Please confirm availability with the Erasmus coordinator.

## **Examination regulations, assessment and grading**

### General

Assessment of course units complies with the Academic Regulations in force at ESTA-IPT, except for the Dissertation, Project and Internship, to which apply the provisions set out in the regulations for the master's degrees offered by the ESTA-IPT.

- Dissertation, Project and Internship have only two assessment seasons and the students are free to choose only one.
- The assessment calendar for the Dissertation, Project and Internship is proposed by the Programme Coordinating Committee to the Technical/Scientific Committee at the beginning of each academic year.
- The general grade improvement scheme does not apply to the Dissertation, Project and Internship.

The overall grade of the master's programme is the arithmetic weighted average rounded off to the ones of the number of ECTS credits and the grades of the course units that form part of the programme of study.

The 10-20 mark expressed on a 0-20 scale is converted into its equivalent in the European grading scale with the awards Satisfactory, Good, Very Good or Excellent.

### Specific

Not applicable

## **Graduation requirements:**

Completion of this course of studies requires a pass in all its constituent modules, including the public defence of Dissertation, Project or Internship Report so as to achieve a total of 120 ECTS accumulated credits in accordance with general and specific assessment regulations.

## **Mode of study:**

Evening programme.

## **Program director or equivalente**

Director: Bruno Miguel Santana Chaparro

Erasmus coordinator: Maria Isabel Vaz Pitacas

ECTS coordinator: Maria Helena Morgado Monteiro

## B - Description of individual course units

<b>Course unit title</b>	Composite Materials
<b>Course unit code</b>	37461
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	First Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	Carlos Alexandre Campos Pais Coelho Docente a contratar 04 UD-Eng (2017/18)
<b>Learning outcomes of the course unit</b>	Students will learn about composite materials, its composition, manufacturing, analysis and design.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme components</b>	Not applicable
<b>Course contentes</b>	1. INTRODUCTION TO COMPOSITE MATERIALS 2. LAW OF MECHANICAL BEHAVIOUR OF A LAMINA 3. MECHANICAL BEHAVIOUR OF A LAMINA 4. MECHANICAL BEHAVIOUR OF A LAMINATE 5. STUDY OF STRUCTURAL ELEMENTS OF COMPOSITE MATERIALS
<b>Recommended or required Reading</b>	- Gay, D.(2001). <i>COMPOSITES MATERIALS: DESIGN AND APPLICATIONS</i> . : CRC Press - Jones, R.(1999). <i>MECHANICS OF COMPOSITE MATERIALS</i> . : Taylor & Francis - Marín, J. e París, F. e Cañas, J. (2006). <i>INTRODUCCION AL ANALISIS Y DISEÑO CON MATERIALS COMPUESTOS</i> . : Universidad de Sevilla, Escuela Superior de Ingenieros Industriales - Moura, M.(2005). <i>MATERIAIS COMPÓSITOS: MATERIAIS, FABRICO E COMPORTAMENTO MECÂNICO</i> . : Publindústria
<b>Planned learning activities and teaching methods</b>	Contents will be mainly delivered through lectures and practical (analytical, numerical and experimental) coursework.
<b>Assessment Methods and criteria</b>	Assessment comprises: continuous (class) and final assessment (exams).
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable

## B - Description of individual course units

<b>Course unit title</b>	Mechanical Vibrations
<b>Course unit code</b>	374616
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	First Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	António Jorge Martins de Araújo Gomes
<b>Learning outcomes of the course unit</b>	Students will be provided with knowledge of the mechanical vibration phenomenology. They will improve skills in the analysis and characterisation of oscillating motion in mechanical systems.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme componentes</b>	Not applicable
<b>Course contentes</b>	1 - Basics of mechanical vibration: Mechanical vibration, the phenomenology of mechanical vibration, vibration system, classification of vibration systems, vibration analysis procedures, harmonic motion. 2 - Single-degree-of-freedom systems: Differential equation of motion, free vibration, natural frequency, damping ratio, logarithmic decrement ...
<b>Recommended or required Reading</b>	- Rao, ,(2016). <i>Mechanical Vibrations</i> . (Vol. 1). Londres: Prentice Hall
<b>Planned learning activities and teaching methods</b>	Traditional lectures aided by audio-visual presentations. Frequent presentation of illustrative examples and problem-solving activities.
<b>Assessment Methods and criteria</b>	Assessment comprises: continuous (during class periods). Summative assessment includes final exams: Regular exam, re-sit and special exam.
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable



## B - Description of individual course units

<b>Course unit title</b>	Metal Forming
<b>Course unit code</b>	37464
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	First Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	Docente a contratar 04 UD-Eng (2017/18)
<b>Learning outcomes of the course unit</b>	This module explores subjects related with metal forming, equipment and technologies used as well as theoretical and practical issues.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme components</b>	Not applicable
<b>Course contents</b>	1. PLASTICITY 2. WORK HARDENING 3. PLASTIC INSTABILITY 4. TEMPERATURE AND STRAIN-RATE EFFECTS 5. TECHNOLOGY 6. NUMERICAL SIMULATION OF LARGE DEFORMATION PROCESSES
<b>Recommended or required Reading</b>	<ul style="list-style-type: none"> <li>- HOSFORD, W. e CADDELL, R. (2007). <i>METAL FORMING: MECHANICS AND METALLURGY</i>. : Cambridge University Press</li> <li>- BANABIC, D.(2007). <i>ADVANCED METHODS IN MATERIAL FORMING</i>. : Springer</li> <li>- KHAN, S.(1995). <i>CONTINUUM THEORY OF PLASTICITY</i>. : Wiley-Interscience</li> <li>- Rodrigues, J. e Martins, P. (2010). <i>Tecnologia Mecânica - Tecnologia da Deformação Plástica</i>. (Vol. I e II). Lisboa: Escolar Editora</li> </ul>
<b>Planned learning activities and teaching methods</b>	Students will be introduced to each topic in its theoretical dimension so as to consolidate concepts. Theoretical lectures will be complemented with exercises.
<b>Assessment Methods and criteria</b>	Assessment comprises: mid-term test and final exams.
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable

## B - Description of individual course units

<b>Course unit title</b>	Numerical Simulation
<b>Course unit code</b>	37463
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	First Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	Bruno Miguel Santana Chaparro
<b>Learning outcomes of the course unit</b>	This course aims to provide the basic concepts of the method of finite elements, the stages of its formulation and application to simple practical cases.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme componentes</b>	Not applicable
<b>Course contentes</b>	1. INTRODUCTION 2. INTRODUCTION TO FEM METHODS 3. SIMULATION OF MECHANICAL BEHAVIOUR 4. STUDY OF SPECIAL CASES 5. STUDY OF PRACTICAL CASES
<b>Recommended or required Reading</b>	<ul style="list-style-type: none"> <li>- Reddy, J.(2005). <i>AN INTRODUCTION TO THE FINITE ELEMENT METHOD</i>. : McGraw-Hill</li> <li>- Klaus-Bathe, J.(1996). <i>FINITE ELEMENT PROCEDURES</i>. : Prentice-Hall</li> <li>- Teixeira-Dias, F. e Cruz, J. e Valente, R. e Sousa, R. (2010). <i>Método dos Elementos Finitos</i>. Lisboa: Edições Técnicas e Profissionais (ETEP)</li> <li>- Hartmann, F. e Katz, C. (2004). <i>STRUCTURAL ANALYSIS WITH FINITE ELEMENTS</i>. : Springer</li> </ul>
<b>Planned learning activities and teaching methods</b>	Lectures supported by data show. Frequent presentation of illustrative examples and problem-solving activities.
<b>Assessment Methods and criteria</b>	Assessment comprises: continuous (during class periods) and summative Assessment is based based on the works done during the classes and a final FEM project.
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable

## B - Description of individual course units

<b>Course unit title</b>	Surface Engineering
<b>Course unit code</b>	37465
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	First Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	Isabel Maria Duarte Pinheiro Nogueira
<b>Learning outcomes of the course unit</b>	On completion of this unit students should understand the key concepts on Tribology including surface topography, wear, solid-solid interaction, lubrication, lubricants and lubrication regimes. They should also understand the various types of surfaces and their characteristics.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme components</b>	Not applicable
<b>Course contents</b>	1. INTRODUCTION TO SURFACE ENGINEERING 2. SOLID SURFACES 3. CONTACT MECHANICS 4. FRICTION 5. WEAR 6. RHEOLOGY AND LUBRICATION 7. SURFACE TREATMENT
<b>Recommended or required Reading</b>	<ul style="list-style-type: none"> <li>- Silva, F.(1995). <i>TRIBOLOGIA</i>. : Fundação Calouste Gulbenkian</li> <li>- Davim, J.(2011). <i>TRIBOLOGY FOR ENGINEERS: A PRACTICAL GUIDE</i>. : Woodhead Publishing</li> <li>- Neale, M.(1993). <i>A TRIBOLOGY HANDBOOK</i>. : SAE/Butterworth</li> <li>- Shigley, J.(2004). <i>MECHANICAL ENGINEERING DESIGN</i>. :</li> </ul>
<b>Planned learning activities and teaching methods</b>	Subject content will be taught through lectures. Topics will be presented with practical and simple examples and exercises in order that students consolidate the concepts.
<b>Assessment Methods and criteria</b>	Assessment will include: Mid-term tests, final exam and re-sits: written test/exam (50%) and coursework (50%). Both components are compulsory.
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable

## B - Description of individual course units

<b>Course unit title</b>	Energy Management and Thermal Systems
<b>Course unit code</b>	374610
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	Second Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	Flávio Rodrigues Fernandes Chaves
<b>Learning outcomes of the course unit</b>	Management, investment project evaluation, technical solution analysis, primary and secondary energy consumption, energy saving. Energetic auditing Theoretical and practical skills in renewable energy production.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme components</b>	Not applicable
<b>Course contents</b>	1. Fundamentals 2. Thermal power stations with boiler 3. Thermal power stations with chiller 4. Water systems 5. Air treatment systems 6. Thermal and photovoltaic solar systems 7. Air conditioning and AVAC units 8. Control and use of natural light and artificial lighting 9. Autonomous energy consumption systems and components 10. Energetic auditing
<b>Recommended or required Reading</b>	- Cabral, J.(2008). <i>GESTÃO DA MANUTENÇÃO DE EQUIPAMENTOS, INSTALAÇÕES E EDIFÍCIOS</i> . : - Duffie, J. e Beckman, W. (2006). <i>SOLAR ENGINEERING OF THERMAL PROCESSES</i> . : John Wiley & Sons Inc - Kalogirou, S.(2009). <i>SOLAR ENERGY ENGINEERING: PROCESSES AND SYSTEMS</i> . : Elsevier Inc - ,.(2009). <i>AUDITORIAS ENERGÉTICAS, A NOVA REGULAMENTAÇÃO E A SUA EXECUÇÃO</i> . :
<b>Planned learning activities and teaching methods</b>	Teaching methods include mainly lectures but some of them focus on practical aspects of the subject matter complemented by coursework in energy auditing.
<b>Assessment Methods and criteria</b>	Assessment includes a closed-book theoretical/practical written test covering all subject matter, based on the handouts supplied and regulations as well as practical coursework. Final grade= Written test (50%) + coursework (50%)
<b>Language of Instruction</b>	Portuguese   <b>Mentoring in English</b>
<b>Work placement(s)</b>	Not applicable

## B - Description of individual course units

<b>Course unit title</b>	Equipment Design and Development
<b>Course unit code</b>	37466
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	Second Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	Bruno Miguel Santana Chaparro
<b>Learning outcomes of the course unit</b>	Students are expected to acquire equipment design and development skills. The course focuses on key technologies and theoretical and practical aspects so as to enable students to design mechanical equipment.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme componentes</b>	Not applicable
<b>Course contentes</b>	1. Product design 1.1. Mechanical Design 1.2. Electric Design 1.3. Electronic Design 2. Technical Production Data 3. Commissioning and Testing
<b>Recommended or required Reading</b>	- PIRES, N.(2012). <i>AUTOMAÇÃO INDUSTRIAL</i> . : ETEP - BOLTON, W.(2008). <i>MECHATRONICS: A MULTIDISCIPLINARY APPROACH</i> . : Prentice Hall - CARRYER, J. e OHLINE, M. e KENNY, T. (2010). <i>INTRODUCTION TO MECHATRONIC DESIGN</i> . : Prentice Hall
<b>Planned learning activities and teaching methods</b>	Each topic will be addressed in its theoretical and practical aspects. Problem solving will be used to reinforce the concepts.
<b>Assessment Methods and criteria</b>	Assessment includes practical coursework according to the assessment criteria set out in relevant regulations.
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable

## B - Description of individual course units

<b>Course unit title</b>	Fracture Mechanics
<b>Course unit code</b>	37467
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	Second Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	Jorge Manuel Afonso Antunes
<b>Learning outcomes of the course unit</b>	On completion of this course students should be able to solve fracture mechanics problems on mechanical design of parts and structural components and develop skills that will enable them to analyse sizing criteria.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme componentes</b>	Not applicable
<b>Course contentes</b>	1- Introduction. 2- Linear elastic fracture mechanics. 3- Concept of the integral J and CTOD. 4- Fatigue. 5- Creep. 6- Fitness for service concept.
<b>Recommended or required Reading</b>	- Branco, C.(1985). <i>MECÂNICA DOS MATERIAIS</i> . : Fundação Calouste Gulbenkian - Wulpi, D.(1999). <i>UNDERSTANDING HOW COMPONENTS FAIL</i> . : ASM - Morozov, N.(2000). <i>DYNAMICS OF FRACTURE</i> . : Springer
<b>Planned learning activities and teaching methods</b>	Conventional lectures and expository lessons. Theoretical/practical lessons involving case study discussions.
<b>Assessment Methods and criteria</b>	Practical assignment: written report (60%) + oral presentation (40%).
<b>Language of Instruction</b>	Portuguese   <b>Mentoring in English</b>
<b>Work placement(s)</b>	Not applicable

## B - Description of individual course units

<b>Course unit title</b>	Industrial Robotics
<b>Course unit code</b>	37468
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	Second Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	Bruno Miguel Santana Chaparro
<b>Learning outcomes of the course unit</b>	At the end of this course students should be able to choose the type of robot suitable for the desired application and understand any programming language of manipulators.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme components</b>	Not applicable
<b>Course contents</b>	1. INTRODUCTION TO ROBOTICS 2. INDUSTRIAL APPLICATIONS OF ROBOTS 3. STRUCTURE AND TYPES OF MANIPULATORS 4. COORDINATE SYSTEM 5. KINEMATICS OF MANIPULATORS 6. INVERSE KINEMATICS
<b>Recommended or required Reading</b>	- Santos, V.(2004). <i>Robótica Industrial</i> . (Vol. 1). (pp. 1-166). Aveiro: Universidade Aveiro - Rosário, J.(2010). <i>ROBÓTICA INDUSTRIAL I : MODELAGEM, UTILIZAÇÃO E PROGRAMAÇÃO</i> . : ão Paulo: Baraúnaú - Pires, N.(2002). <i>AUTOMAÇÃO INDUSTRIAL</i> . : ETEP
<b>Planned learning activities and teaching methods</b>	The learning methodologies are based on the lecture method of the syllabus and in a practical work (programming manipulators robot). The practical work is intended to allow an approach to the industrial environment.
<b>Assessment Methods and criteria</b>	The course evaluation consists of two forms: continuous assessment (assessment during the class period) and summative (final exams).
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable

## B - Description of individual course units

<b>Course unit title</b>	Production Management
<b>Course unit code</b>	37469
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	First Year
<b>Semester/Trimester when the course unit is delivered</b>	Second Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	António Jorge Martins de Araújo Gomes
<b>Learning outcomes of the course unit</b>	On completion of this course students should understand the basics of the production function in business. They should be able to analyse critically the operational performance and operational practices of a productive flow.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme components</b>	Not applicable
<b>Course contents</b>	1. PRODUCTION MANAGEMENT (CONCEPTS) 2. PRODUCTION TYPOLOGY 3. DEMAND FORECAST 4. STRATEGIC DECISIONS 5. AGGREGATE PLANNING 6. ADVANCED PRODUCTION MANAGEMENT
<b>Recommended or required Reading</b>	<ul style="list-style-type: none"> <li>- Courtois, A. e Pillet, M. e Martin, C. (1997). <i>GESTÃO DA PRODUÇÃO</i>. Lisboa: LIDEL</li> <li>- Stevenson, W.(2006). <i>PRODUCTION/OPERATIONS MANAGEMENT</i>. Boston: Irwin/McGraw-Hill</li> <li>- Chase, R. e Aquilano, N. e Jacobs, F. (2005). <i>PRODUCTION AND OPERATIONS MANAGEMENT FOR COMPETITIVE ADVANTAGE</i>. Boston: Irwin / McGraw-Hill</li> <li>- Heizer, J. e Render, B. (2006). <i>OPERATIONS MANAGEMENT</i>. New Jersey: Pearson/Prentice Hall</li> </ul>
<b>Planned learning activities and teaching methods</b>	Subject content will be taught through lectures. Topics will be presented with practical and simple examples and exercises in order that students consolidate the concepts.
<b>Assessment Methods and criteria</b>	- Continuous assessment: partial tests (40%) and group and individual coursework (60%). or - Final assessment: Final exam (40%) and group and individual coursework (60%).
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable



## B - Description of individual course units

<b>Course unit title</b>	(*)
<b>Course unit code</b>	374613
<b>Type of course unit</b>	Optional
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	Second Year
<b>Semester/Trimester when the course unit is delivered</b>	Annual
<b>Number of ECTS credits allocated</b>	54
<b>Name of Lecturer(s)</b>	
<b>Learning outcomes of the course unit</b>	Develop the ability to connect all the acquired knowledge in order to solve complex and multidisciplinary problems
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable
<b>Recommended optional programme componentes</b>	Not applicable
<b>Course contentes</b>	Project of Machinery and Equipments Technical drawings Project management
<b>Recommended or required Reading</b>	
<b>Planned learning activities and teaching methods</b>	Tutorial Orientation
<b>Assessment Methods and criteria</b>	Project with presentation and discussion
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable

(\*) This course may not be available in certain academic years. Please confirm availability with the Erasmus coordinator.

## B - Description of individual course units

<b>Course unit title</b>	Seminar
<b>Course unit code</b>	374615
<b>Type of course unit</b>	Compulsory
<b>Level of Course unit</b>	Second Cycle
<b>Year of Study</b>	Second Year
<b>Semester/Trimester when the course unit is delivered</b>	First Semester
<b>Number of ECTS credits allocated</b>	6
<b>Name of Lecturer(s)</b>	
<b>Learning outcomes of the course unit</b>	Seminar provides students with the opportunity to explore a wide range of mechanical engineering topics as well as other topics that are relevant to the professional life of students such as entrepreneurship, engineering ethics, etc.
<b>Mode of delivery</b>	Face-to-face
<b>Prerequisites and co-requisites</b>	Not applicable.
<b>Recommended optional programme componentes</b>	Not applicable.
<b>Course contentes</b>	The work plan will be defined at the beginning of each academic year by the dissertation/internship/project supervisors and the Programme Coordinating Committee.
<b>Recommended or required Reading</b>	
<b>Planned learning activities and teaching methods</b>	Sessions with guest speakers (engineers, experts and other renowned professionals) will be held to share knowledge and professional experience in mechanical engineering related areas.
<b>Assessment Methods and criteria</b>	Attendance to at least 50% of the planned seminars will be required. Students who fulfil this requirement will be assessed according to the quality of the activity report and oral presentation.
<b>Language of Instruction</b>	Portuguese
<b>Work placement(s)</b>	Not applicable.

