The main language of instruction at Coimbra Institute of Engineering is Portuguese. However, some courses from degree and master programs can be offered in English and/or with a tutorial support in English.

The Master Course Engineering and Industrial Management is taught in Portuguese at the moment. Some of the subjects might have tutorial support in English.

The ECTS catalogue includes subject contents in English. Students can choose subjects from this Catalogue to the study plan proposal (Learning Agreement) to be analyzed carefully by the Departmental Coordinators and to be adjusted if necessary.

This ECTS catalogue contains information which is valid for this academic year. ISEC reserves the right to adjust the courses offered during the academic year and is not responsible for typing errors or printing mistakes.

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Chemical and Biological Eng. Department Coordinator
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Rua Pedro Nunes – Quinta da Nora
3030 – 199 Coimbra
PORTUGAL
Tel.: (+351) 239 790 330
davidd@isec.pt
## ECTS CATALOGUE

Code 6064200- MASTER Engineering and Industrial Management

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Course Unit: PRODUCT AND SERVICE DESIGN

Subject type: Compulsory  
Research Area: Management and Industrial Engineering

Year: 1  
Semester: 2  
ECTS: 6.0

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Total of Working Hours: 156

Lecturer:

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Responsible(s) Lecturer(s): Belmiro Duarte

Goals / Skills
Provide the students with the ability: (i) to set a product portfolio and design a strategy for product planning; (ii) to generate product and service concepts, select them and test them; and (iii) to search for robust solutions.

Program Contents
1. Product portfolio development processes - organization dependency aspects
2. Processes of development of product portfolio and organizations
3. Planning of product development - timing and strategies
4. Identification of customer needs - market research tools
5. Product specifications
6. Generation of concepts
7. Selection of concepts
8. Test of concepts
9. Robust design via Taguchi Methods - Introduction to experiments design
10. Estimation of production costs
Work Done
Development of the concept for a product or service following a systematic approach in groups of 4 to 6 students. The product or service to develop may be proposed by students.

Teaching Methodology
In classes the theoretical aspects of the methodology will be addressed using common teaching material. Some of the classes are dedicated to intermediate presentations of project components, and discussion of strategies to follow. At the end a summative presentation of the project will occur.

Bibliography

Evaluation Method
The assessment is done based on the intermediate presentations, final presentation, and writing material, with emphasis on the final report. No exam will be considered for assessment.

Conditions for Exam Admission
The students are required to attend at least 75% of the classes, and no student can be enrolled in the course after the third week as the work groups are already developing the projects.

Access Conditions and Attendance Excuse
Not applicable.

Conditions for Results Improvement
The students are allowed to improve the project and require a new assessment.

Date
11.02.2019

Signature from the lecturer responsible for the course

Im-13-78_A1
Program Contents

Course Unit

ENERGY MANAGEMENT

Subject type

Engineering Sciences  Research Area  Electrical Engineering

Year  1st  Semester  2nd  ECTS  6

Working Hours

Unaccompanied Working Hours

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Total of Working Hours  156

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Goals / Skills

The main aims of this course unit are:
- To familiarize students with the basic concepts of energy management
- To know the tariff legislation
- To learn the methodology, phases and expected outputs of energy audits in industry
- To learn about technologies and systems for improving energy efficiency
- To help students to develop the knowledge and analytical skills needed for a successful career in the energy sector, in terms of energy policy analysis and energy management

Program Contents

Lighting systems; Electric Motors; Compressed Air; Steam and Process Heating Systems; Heat Recovery. Renewables in Industry.

Work Done
Laboratory case studies

Teaching Methodology

Lectures, case-studies presentation, work/work Group, case-studies analysis.

Bibliography

- Teaching support material
- UE and Portuguese Legislation (energy field).
- R. Saidur, A review on electrical motors energy use and energy savings (2010).
- OECD/IEA. The multiple benefits of energy efficiency improvements (2012).

Evaluation Method
Final exam

Conditions for Exam Admission

Access Conditions and Attendance Excuse

Conditions for Results Improvement
According to the legislation

Date
06/02/2019

Signature from the lecturer responsible for the course

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Program Contents

Course Unit: DECISION SUPPORT METHODS

Subject type: Basic Science  Research Area: Mathematics

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Goals / Skills

To present the potential of decision support methods for linear, nonlinear and stochastic cases in the context of monitoring, research and operational management, with particular emphasis on formulation/troubleshooting decisions within the Industrial Engineering and Management, and also to introduce and work with the existent useful tools to obtain optimal solutions.

Program Contents


Im-13-78_A1
Work Done
One work (with written report and oral presentation) of application/research in the area of Decision Support Methods (30% weighting).

Teaching Methodology
The teaching methodologies are the followings: Lectures by the teacher; Practical exercises by students (whenever possible applied to Industrial Engineering and Management).

Bibliography
- Management Decision Making, George E. Monahan, Cambridge Univ. Press, 2000
- Material de apoio às aulas (textos e exercícios práticos) (available in moodle).

Evaluation Method
Evaluation consists of one written exam (70% weighting), with a minimum of 7 values out of 14, and one work with written report and oral presentation (30% weighting). Alternatively, the evaluation can be made through a final written exam (100%).

Conditions for Exam Admission
The student must be officially enrolled in the course unit (Secretaria Virtual).

Access Conditions and Attendance Excuse
Not applicable.

Conditions for Results Improvement
Rules of REACTA

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Course Unit: MANUFACTURING TECHNOLOGIES

Subject type: Specialty Sciences
Research Area: Mechanical Engineering

Year: 1  Semester: 1  ECTS: 6

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Total of Working Hours: 160

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Responsible(s) Lecturer(s): João Miguel Maia Carrapichano

Goals / Skills

To know the main forming processes by plastic deformation, the main technologies used and the products obtained; to know the casting process, the main technologies used and the products obtained; to know the main technologies used in the manufacture of prototypes.

To select tools and cutting parameters for machining operations; to build manually CNC programs for basic milling operations; to use Computer Aided Manufacturing software programs to create CNC programs for advanced machining operations; to use measuring devices.

Program Contents


Additive Manufacturing Technologies. Exposition of the main additive manufacturing systems used in the production of components associated with mechanical systems.

Reverse Engineering. From the physical model to the 3D CAD file - generation conceptual models from physical models. Digitization of mechanical components; 3D scanning and 2D profiles. Different types of digitizers and main applications; Using a Roland Laser Scanner, model LPX 600. The Roland EZ Studio program and the selection of scanning parameters. The Geomagic Software and its connection to Solidworks. The Mimics Software and its application in the context of
segmentation of radiological images. Experimental execution of an application example.
CAD/CAM technologies. CAD/CAM methodology to create a machining program. Machining strategies used in CAM programs. Post-processing and execution of manufacturing mechanical parts.

Work Done
In the theoretical-practical classes will be carried out demonstrative works related to different technologies of manufacture. The following demonstrations of practical work are highlighted: use of CAD / CAM technology to create machining cycles; manufacture of mechanical components in CNC machine tools; manufacture of components in additive manufacturing equipment; dimensional characterization of mechanical components; characterization of the roughness of mechanical components; reverse engineering - from physical model to 3D geometry; reverse engineering - from radiological examination to 3D model; use of model production technologies in medical context.

Teaching Methodology
Theoretical classes use the lecture method, were main contents are transmitted at those theory classes used expositive techniques by PowerPoint support. At theoretical-practical classes students take contact with the main tasks and operations that take place in a machining center and elaborate programs in CNC language, either manually or using CAM software. Different mechanical measuring instruments are used. The evaluation of the theoretical and theoretical-practical components is carried out by individual or group work, involving technologies available in ISEC. Guest specialist can be invited to expose some parts of the program contents.

Bibliography
L. Veiga da Cunha - Desenho Técnico, Fundação Calouste Gulbenkian, 2000
Mastercam, Geomagic, Mimics tutorials
Manuais e tutoriais do Software
LASCOE, O.D. - Handbook of Fabrication Processes, ASM International Metals Park, Ohio
CHIIVERINI, Vicente - Tecnologia Mecânica, Vol II, Makron Books86042
Supporting texts (by course unit teachers).

Evaluation Method
Final written exam grade (0-20) according to official school calendar (50% to theoretical lessons and 50% to theoretical-practical instructions and developments). Students coming from undergraduate courses who have demonstrated in-depth part of the contents taught in the theoretical-practical classes, may be exempted from the corresponding classes. To Erasmus student’s progress assessment can be established by lectures as complementary meetings in English language, to develop parallel written project work in a predefined subject, with individual final presentation and discussion.

Conditions for Exam Admission
According to general rules used in the school.

Access Conditions and Attendance Excuse
Without conditions.

Conditions for Results Improvement
Improving grades or retaking exams is allowed, according to general rules of the course and used in the school.

Date
09.10.2018

Signature from the lecturer responsible for the course
Course Unit: PRODUCTION MANAGEMENT

Subject type: 
Research Area: Engineering and Industrial Management

Year: 1st  Semester: 1st  ECTS: 6

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Total of Working Hours: 156

Lecturer:

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Responsible(s) Lecturer(s): David José Rocha Domingues

Goals / Skills

In specific terms, it is intended that, with this curricular unit, the student master the knowledge and tools necessary for the planning, programming and control of operations, in order to optimize industrial management.

The aim is to develop the ability to understand and apply complex models describing the planning and scheduling of production operations, as well as the following generic competences:

- ability to apply the knowledge gained in solving new problems with increasing complexity;
- capacity for lifelong learning on an autonomous basis;
- Oral and written communication skills for different audiences.
Program Contents

1. Production and Operations Strategy
   The Decision Process
   From Enterprise Strategy to Functional Strategies
   Competitive Priorities in Operations Strategy
   From Strategy Models to Operations Strategy

2. Flexibility
   Aspects Involved in Flexibility
   Global Determinants and Framework for Flexibility
   Direct Determinants of Flexibility
   Flexibility, Planning and Programming

3. Capacity
   Capacity Concepts and Calculation
   Capacity Planning
   Theory of Constraints
   Capacity in Services

4. Implementation of productive facilities
   Basic Layout Settings
   Rational Procedure for Preparing a layout (SLP)
   Quantitative Methods in Layout Determination
   Assembly Lines
   Deployment and Material Handling

5. Aggregate production planning
   The aggregate planning process, variables and costs
   Basic techniques of aggregate production planning: adjustment of production by looking for changes in labor, extraordinary labor or dead time, inventory changes and subcontracting (simple and optimized)
   Advanced models of aggregate planning:
   Holt's linear decision rule, Bowman's transport model, Goal Programming model, Virgin heuristic model, search decision rule, parametric production planning, heuristic model of production levels, and integrated production-marketing-finance model.

6. Inventory management
   Characteristics, costs and classification of stocks.
   Supply models with continuous demand:
   economical lot with instant replacement, with continuous replacement, with quantity discounts and with rupture
   Supply models with discrete demand:
   periodic ordering, Silver-Meal, Periodic Amount (IPPA) and Wagner-Within algorithms.
   Stochastic supply models and the security stock: random search and replacement period
   Supply models by cyclical review.
   Purchasing process: the buying cycle, trading and risk.

7. Schedule Operations
   Sequencing with heuristics: simple and combined heuristic rules, performance-criteria evaluation
   Complex heuristic algorithms
   Dynamic programming
   Methods of assignment: the Hungarian method
   Programming with finite capacity
   Programming in Continuous Environments:
   Johnson algorithm, simple and global weighted flow rate

8. Materials Requirement Planning MRP / Just-In-Time
   Materials Requirement Planning (MRP)
   Capacity Programming
   MRP and Programming Heuristics
   Just-In-Time
   Approach Lean and JIT
   Kanban and Visual Production Control Systems
   Sequencing in JIT environment

Work Done
Evaluation Method
Two alternatives of assessment methodology are available: distributed and by final exam.
In the distributed evaluation there are two tests, with weighting of 2x40% and a set of cases discussed in class with a weighting of 20%.

Conditions for Exam Admission
Acc regulatory terms

Access Conditions and Attendance Excuse
Not applicable

Conditions for Results Improvement
By exam

Date
12-Oct-2018

Signature from the lecturer responsible for the course

Signature of Teacher:
Program Contents

Course Unit  MARKET RESEARCH AND DATA ANALYSIS

Subject type  Research Area  MATHEMATICS

Year 1st  Semester 1st  ECTS 6

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Total of Working Hours 156

Lecturer

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Goals / Skills

Goals
It is intended that the student acquire the necessary bases to participate in market studies and perform data analysis, using computational tools using the software / programming language R.

Skills
- Acquisition of the essential "language" associated with Data Analysis and Market Studies that allows students to independently develop their future professional projects as well as the ability to integrate multidisciplinary teams involving specialists and clients.
- Know how to write basic code using the R language and interpret the results obtained

Program Contents
2. Data analysis using multivariate statistical techniques using software / R language, including multiple regression and principal component analysis.
Work Done
Carrying out 4 practical works of data analysis, using software R.

Teaching Methodology

Theoretical classes of exposition of the programmatic contents. Laboratory classes to solve theoretical-practical exercises, mainly using statistical software.

Bibliography
- Class notes
- Ross, S. - Introduction to Probability and Statistics for Engineers and Scientists, Elsevier
- Ryan, T. - Modern Engineering Statistics, Wiley
- Hill, M. & Hill, A. - Questionnaires, Sisabo Editions
- Reis, E. - Applied Multivariate Statistics, Sisabo Editions

Evaluation Method
Distributed Assessment or Final Exam Evaluation. The Distributed Evaluation consists in the accomplishment of four practical works of data analysis, each of them quoted to 5 values. The final classification will be the sum of the notes of the works, provided that the note of each one is greater than or equal to 2.5 values.

The Final Exam Assessment (normal and appeal period) consists of a 20-item exam. The student is approved if he has a minimum final mark of 10 points.
In any of the assessment methods, if the grade is higher than 18 points, the student must undergo an additional test. Otherwise, the grade of 18 values will be assigned.

Conditions for Exam Admission
Access to the exam is allowed to all students duly enrolled in the course unit.

Access Conditions and Attendance Excuses

Conditions for Results Improvement
In accordance with the conditions in use in ISEC.

Date
03/10/2018

Signature from the lecturer responsible for the course
[Signature]
Course Unit
LOGISTICS AND DISTRIBUTION CHAINS

Subject type
Specialty Sciences  
Research Area  
Industrial Engineering and Management

Year  
1st  
Semester  
1st  
ECTS  6

Working Hours

Activity Type  
Theoretical Lectures  
Theoretical-Practical Lectures  
Practical-Laboratory Lectures  
Tutorial Orientation  

Working Hours Per Week  
2  
2  
2  

Total Hours  
28  
28  

Unaccompanied Working Hours

Activity Type  
Study  
Works / Group Works  
Project  
Evaluation  
Additional  

Total Hours  
56  
20  
6  

Total of Working Hours

Lecturer

Activity Type  
Theoretical Lectures  
Theoretical-Practical Lectures  
Practical-Laboratory Lectures  
Tutorial Orientation  

Name  
Silvino Dias Capitão  
Silvino Dias Capitão  
Silvino Dias Capitão  

Qualifications  
PhD  
PhD  

Category  
Coordinator  
Professor  
Coordinator  
Professor  

Goals / Skills
The objective of the curricular unit is to develop knowledge related to management of logistics chain (planning, transportation, warehousing and handling of goods), including management of services in the supply chain.

It also aims to raise the students’ awareness of the importance of issues related with supply chain management in an integrative perspective of all actors and flows involved in the chain, taking into account the requirements placed to logistics, management and monitoring decision-making process.

The curricular unit also intends to give the students a conceptual support that gives them a comprehensive view of the supply chain, the logistics function, the transport and distribution mechanisms, as well as an adequate perception of the proposed methodologies to plan and manage of the supply chain’s operation.

Program Contents
LOGISTICS AND SUPPLY CHAIN; Logistics and Logistics Management; The Supply Chain; Fundamental Aspects of a Logistics System; The Theory of Transition Costs and Network Theory; Logistic Attributes; Logistic Activities; The Value
TRANSPORT: Role of Transport in the Supply Chain; Relevant Factors in the Choice of Transport; Transport Systems; Logistics Platforms; Planning of Routes; Flow Models.

MANAGEMENT OF WAREHOUSES IN THE SUPPLY CHAIN: Typologies of Warehouses; Basic Warehousing Operations; Warehousing and Handling Systems; Design; Layout; Stock and purchase management.

INFORMATION AND COMMUNICATION TECHNOLOGY IN THE SUPPLY CHAIN: Basic Communication (EDI, barcode, RFID, order processing, ...); Warehouse and Inventory Management Systems; Fleet Management Systems; Routing and scheduling systems; Commerce Using the Internet (e-commerce); IT in Supply Chain Management.

SERVICES MANAGEMENT: The Nature of Services; Flow Management in Services; Location of Infrastructures.

DECISION MODELS IN THE SUPPLY CHAIN: Project of Supply Chains; Location problems (single equipment, multiple equipment, discrete location problems: simple location with and without capacity limits, p-median problem, coverage problem, p-center problem).

Work Done

Practical component:

• Analysis exercises of logistics and supply chain case studies
• Study and application of optimization models, from a perspective of integrated chain management: definition of routes; transport and trans-expedition; flow models; location problems

Groups of 2 students carry out a literature review (and when possible also describing a concrete case study) on logistics topics related to the curricular unit. The oral presentation and discussion of the written articles within the classroom is mandatory.

Teaching Methodology

Case studies: students carry out analysis of solutions in a professional context to solve complex problems;
Group learning: students work in groups to solve a particular problem and learn to work in a team in an efficient way;
Discussion: there is an exchange of ideas in groups of approximately 5 to 20 students;
Practical work: students develop solutions to practical problems or develop practical projects;
Written and oral presentation of reports: students present certain topics, reports or projects, in written and / or oral form;
Seminars: experts present certain topics followed by question and answer sessions.
Lecturing method; Problem solving; Learning by project development; Laboratory practice.

Bibliography


Evaluation Method

• Practical work

This project is mandatory and should be carried out in groups of 2 elements. The project will have a weight of 30% in the final grade.

• Exam

Written test at the end of the semester, weighing 70% in the final grade. Minimum grade of 8/20.

Conditions for Exam Admission

Only students who have delivered the mandatory project in the established dates can access the exam.
Access Conditions and Attendance Excuse
Not applicable, except in the specific cases defined by law.

Conditions for Results Improvement
The student who enrolls for classification improvement will do the exam to 20 points (minimum 8 points).

The component of the classification obtained for practical work cannot be improved in the academic year in which the work is carried out.

Date
2018/20/08

Signature from the lecturer responsible for the course

[Signature]

Im-13-78_A1
## Ficha de Unidade Curricular

### Unidade Curricular

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### Natureza Curricular

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### Área Científica

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### Ano

| 2º |

### Semestre

| 1º/2º |

### ECTS

| 48 |

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### Objectivos / Competências

- Desenvolver a capacidade do aluno para planejar e organizar uma tese ou projecto ao longo de um ano lectivo, através da definição de objectivos parciais, bem definidos no tempo, com um cronograma pragmático, conducente à conclusão com sucesso de uma tese ou projecto;
- Facilitar ao aluno a oportunidade de demonstrar a sua autonomia e criatividade;
- Aplicar os conhecimentos e as técnicas adquiridas ao longo do curso;
- Completar a formação do aluno, com as competências necessárias à prossecução de uma carreira profissional de Engenharia e Gestão Industrial.

### Conteúdo Programático

**Três opções:**

1. Projecto de produto, processo, ou sistema numa organização externa ao ISEC, que pode incluir dois supervisores (um da empresa e o outro do ISEC);
2. Estágio (numa empresa), que se consubstancia num relatório de estágio;
3. Dissertação (I&D), que se consubstancia numa Tese de Mestrado.

### Trabalhos Realizados

Im-13-78_A2
**Metodologias de Ensino**
As metodologias de ensino a utilizar ao longo das diferentes fases do projeto, estágio ou dissertação deverão ser definidas pelos docentes orientadores, em correspondência com os objetivos pretendidos e o perfil do aluno.

**Bibliografia e Elementos de Estudo Facultados**
A bibliografia e outros elementos de estudo específicos para cada projecto, estágio ou dissertação serão indicados pelos respetivos docentes orientadores e ainda resultado da pesquisa realizada pelo aluno.

**Método de Avaliação**
Apresentação oral pública e discussão do relatório de projeto, relatório de estágio ou dissertação, com uma duração máxima de duas horas, perante um júri de três a cinco membros, incluindo os docentes orientadores.

**Condições de Acesso a Exame**

**Condições de Obtenção e Dispensa de Frequência**

**Condições de Melhoria de Classificação**

---

**Data**
12.10.2018

**Assinatura do Docente Responsável pela Unidade Curricular**

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ENTREPRENEURSHIP AND INDUSTRIAL PROPERTY

Research Area: Industrial Engineering and Management

Year 2  Semester 1  ECTS 6

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Total of Working Hours 156

Lecturer

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Responsible(s) Lecturer(s): José Luís Ferreira Martinsio

Goals / Skills

The overall objective of the course is to develop knowledge and skills in the area of Entrepreneurship and Industrial Property, backing up on classroom lessons and research in specific papers performed by students and guided by the teacher.

In order to successfully complete the curricular unit, students should be able to:
- Apply the acquired knowledge in solving specific problems of business life, supported by own arguments;
- Collect, select and interpret relevant information in the area of entrepreneurship, coupled with the capacity for analysis, synthesis and formulation of opinions;
- Collect, select and interpret relevant information in the field of Industrial Property, managing to interpret a patent application;
- Create a business plan and all necessary steps to create a new business, such as the legislative framework; fiscal framework and bureaucratic procedures;
- Evaluate different alternatives and justify the proposed solutions
- Communicate written and oral, in the context of group work.
Program Contents

Work Done
See evaluation method

Teaching Methodology
The lectures serve to present the subjects taught, as well as, the study materials. Workshops lessons serve to invite experts to give lectures on topics related to the course and also to carry out the business model, patent search, progress meetings with the teacher and clarification of the work progress.

Bibliography
• Estratégia – Sucesso em Portugal, Adriano Freire, Editorial Verbo, 1997
• Marketing Management (8ª Ed), Philip Kotler, Prentice Hall International, 1994

Evaluation Method
To have a positive grade, students must accomplish with success five assignments during the semester:
- Organization of a public event – 15%
- Analysis and report of patents -20%
- Analysis and report on technology trends (report + presentation) – 10%
- Business Plan (report + presentation) – 25%
- Bibliographic search (report + presentation) – 30%

Average of 50% and minimum of 35% in each assessment component.

Conditions for Exam Admission
See evaluation method.

Access Conditions and Attendance Excuse
See evaluation method.

Conditions for Results Improvement
Those in current rules.

Date
17/10/2018

Signature from the lecturer responsible for the course
Program Contents

Course Unit  MAINTENANCE MANAGEMENT

Subject type  Research Area  Engineering and Industrial Management

Year 2  Semester 1  ECTS 6

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Total of Working Hours

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Responsible(s) Lecturer(s)  José Manuel Torres Farinha

Goals / Skills

Goals:
The overall goals of the Maintenance Management Course Unit are to give to the graduates a high level of competence in Maintenance Management, according to the state-of-the-art of this Knowledge Area. These overall objectives are achieved through the following specific objectives:

- To learn the tools of Management of Maintenance of Physical Assets that allow to optimize the costs of their life cycles, namely in operation;
- To learn the management tools that allow to optimize the acquisitions and substitutions of the Physical Assets;
- To learn the tools to diagnose the maintenance status that help to organize a maintenance department considering the following:
  - the basic organization of maintenance;
  - the costs-management tools;
  - the new management models.
- To learn how to use the maintenance standards that allow the certification of maintenance services and providers;
- To learn how to use dynamic modeling techniques that allow to solve complex problems of maintenance, namely for failure situations.

Skills:
The competences that the student should acquire in this Course Unit are the following:

- To know how to act in a Maintenance Department, at the high management level and related functions;
- To know how to dialogue with the various departments of the organization that interact with the maintenance department, namely at the level...
of preparation of documents and processes matched at the top level of the organization;
• To know how to develop a framework of indicators to support the maintenance management activity and of the organization in general, interlinked with the organization’s KPIs.
• To know how to ask for real solutions to the real problems of maintenance, at the level of the state of the art in this area of knowledge.

Program Contents
• THE NOWADAYS MAINTENANCE FUNCTION - Importance of the maintenance function in the management of the Life Cycle of the Physical Assets.
• DIAGNOSIS OF THE MAINTENANCE STATUS - Holistic Method of Diagnosis; Organization and analysis of information collected; Establishment of an action plan for improvements.
• ASSET MANAGEMENT STANDARDS - ISO 55000; ISO 55001; ISO 55002.

Work Done
• On each of the main topics of the Program Content will be carried out a practical work, with a maximum of two elements.

Teaching Methodology
• Theoretical exposition by the teacher;
• Resolution of exercises and analysis of practical cases by students;
• Presentation of case studies by students.

Bibliography
• STANDARDS ISO 55000; ISO 55001; ISO 55002.
• Artigos científicos indexados, designados SCOPUS e ISI.

Evaluation Method
• Elaboration of practical works, with a maximum of two elements, on each about the main topics of the Program Content.

Conditions for Exam Admission
• According to the evaluation methodology and the ISEC's rules (REATA).

Access Conditions and Attendance Excuse
• According to the evaluation methodology and the ISEC's rules (REATA).

Conditions for Results Improvement
• According to the evaluation methodology and the ISEC's rules (REATA).

Date
8, October 2018

Signature from the lecturer responsible for the course
Mestrado - MSc Industrial Engineering and Management

Program Contents

Course Unit: CORPORATE FINANCE

Subject type

Research Area: Industrial Engineering and Management

Year: 1  Semester: 2  ECTS: 6

Working Hours

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Total of Working Hours: 156

Lecturer

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Goals / Skills

The main goal of this course is to provide future industrial engineers with the essential knowledge to understand financial management of manufacturing companies. In this context, three main issues were selected: economic and financial performance analysis, budgeting and short and long terms financial planning.

At the end of this course, students should be able to: i) fully understand and combine the information contained in the different financial statements ii) analyze the different kind of information required to report and judge the overall economic and financial status of the company, iii) Build a company’s budget iv) prepare the medium and long term financial plan.

Program Contents

Work Done
- Financial plan
- Financial analysis report

Teaching Methododoly
The learning process begins with the presentation of the fundamental concepts by the lecturer, followed by the resolution of practical exercises, illustrating the concepts and techniques discussed. During the semester, students should do autonomously two assignments, including written reports and presentations.

Bibliography

- Franco, V. – “Temas de Contabilidade de Gestão - Os custos, os resultados e a informação para a Gestão”, Livros Horizonte
- Menezes, C. - Princípios de gestão financeira, Editorial Presença, 6ª ed., 1996
- Mota, António Gomes & et al. (1997). Gestão financeira: casos práticos. 2ª ed., Centro de Investigação de Mercados e Activos Financeiros

Evaluation Method
- Two assignments done during the semester (groups of 3 students)
  - Financial plan (20% + 10% presentation)
  - Financial analysis report (20%)
- Final Exam (50%).
- Average of 50% and minimum of 40% in each assessment component.

Conditions for Exam Admission
See Evaluation method

Access Conditions and Attendance Excuse
Those in the current rules.

Conditions for Results Improvement
Those in the current rules

Date
21/02/2019

Signature from the lecturer responsible for the course
Program Contents

Course Unit RISK EVALUATION AND MANAGEMENT

Subject type Compulsory Research Area Industrial Engineering and Management

Year 1st Semester 2nd ECTS 6.0

Working Hours

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<td>Study</td>
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<td>Theoretical-Practical Lectures</td>
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<td>Works / Group Works</td>
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<td>Practical-Laboratory Lectures</td>
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<td>Tutorial Orientation</td>
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<td>Evaluation</td>
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Lecturer

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<th>Name</th>
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<td>Theoretical Lectures</td>
<td>Jorge Alexandre Caldeira Gonçalves de Almeida</td>
<td>MSc / Specialist</td>
<td>Adjunct Prof.</td>
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<tr>
<td>Theoretical-Practical Lectures</td>
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<td>Practical-Laboratory Lectures</td>
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<tr>
<td>Tutorial Orientation</td>
<td>Jorge Alexandre Caldeira Gonçalves de Almeida</td>
<td>MSc / Specialist</td>
<td>Adjunct Prof.</td>
</tr>
</tbody>
</table>

Responsible(s) Lecturer(s) Jorge Alexandre Caldeira Gonçalves de Almeida

Goals / Skills

Goals

At the end of this Course Unit students should be able to:

• Structure complex decision problems
• Understand risk factors in a specific case and use the simulation to evaluate and weigh them
• Use different mathematical approaches to allocate resources and analyze problems
• Create and evaluate simple forecast models
• Making decisions in an environment of uncertainty
• Recognize where risk analysis can add value

Skills

Generic Competencies:

1- Create and develop the ability to interpret and master basic concepts of Risk Assessment and Management, to communicate topics of the area exposing ideas, problems, information and interconnection with the external environment.
2- Develop personal skills that allow students to learn independently.
3. Provide students with the ability to work in groups, developing interpersonal relationships as a way to improve their insertion in the labor market.
4- Instill the concern for the quality and rigor in the acquisition of the basic concepts of these areas of knowledge, concepts that will allow the development of decision-making capacities towards of uncertainty.

Specific Skills:
1- Develop knowledge and understanding skills in the areas of Risk Assessment and Management, based on the knowledge acquired in class, in the texts of the specialty and in research conducted by the students.
2. Provide students with the ability to apply the knowledge acquired to solve specific problems and concrete cases of their daily life, thus understanding the world in which they live.
3- Create the capacity to collect, select and interpret relevant information, combined with the ability to analyze, synthesize and formulate own opinions that will allow an active participation in solving problems in these areas of knowledge.

Program Contents
1. Uncertainty and Risk
   1.1. Definition of Uncertainty and Risk
   1.2. Elements of Uncertainty and Risk in the Structuring of Decisions and in Projects
   1.3. Nature and the Sources of Uncertainty
   1.4. Uncertainty and (the role of) Sensitivity Analysis
   1.5. Uncertainty and (the role of) Risk Management
2. Risk analysis
   2.1. Risk Modeling and Uncertainty.
3. Basic Probability Revision
   3.1. Subjective Probabilities
   3.2. Theoretical Probability Models
   3.3. Data-based Probability Models
4. Simulation
   4.1. Information Value
   4.2. Risk Attitudinal Modeling
   4.3. Use of Spreadsheet (Excel) and Programming Languages (Matlab and R) in Simulation.
5. Risk management
   5.1. Key Concepts
   5.2. Reasons for the use of formal risk management processes
   5.3. Risk Management Processes and its Information Base
   5.4. Risk Management Initiated at Different Stages of the Project Life Cycle
   5.5. Effective and Efficient Risk Management
   5.6. Risk Management in Contracts Perspective
   5.7. Organization for Risk Management
Bibliography

- MAKING HARD DECISIONS WITH DECISION TOOLS SUITE UPDATE EDITION/ Clemen, Robert; Reilly, Terry – South-Western College Pub., 2004.
- BASIC BUSINESS STATISTICS: concepts and applications / Levine, David M; Berenson, Mark L. -- Prentice-Hall, 1996.
- STATISTICS FOR BUSINESS AND ECONOMICS / Newbold, Paul; Carlson, William; Thorne, Betty; Prentice Hall (Pearson Studies)-2003

Evaluation Method

Assessment: there will be one practical group assignment (ten points/20) and a written test with a total weight of ten points/20.

Students must have at least 30% in all assessment elements (practical assignment and the written exam) in order to pass this course.

Conditions for Exam Admission

Students must be enrolled in the various examination periods (through moodle and through the academic service whenever applicable) and have at least 30% in all the evaluation elements (i.e. practical assignment) to grant access to the exam.

Access Conditions and Attendance Excuse

Those provided by the current legislation. There will be no compulsory attendance in theoretical and theoretical-practical classes, but students are advised to systematically follow classes, as an essential condition for school achievement and for the correct understanding of the subjects.

Conditions for Results Improvement

Those provided by the current legislation, and cannot be done in the Normal Season.

Date: 17.1.2019

Signature from the lecturer responsible for the course:
Course Unit Description

TECHNICAL ASSETS

Scientific Area: Industrial Engineering and Management

Year 1 Semester 2 ECTS 6

Contact Hours
Type of Activity Hour per Week Total of Hours
Theoretical 2 28
Theoretical-Practical 2 28
Practical / Laboratory
Tutorial guidance
Project

Self Working Hours
Type of Activity Total of Hours
Self-study 75
Homework / Group Work 25
Project
Evaluation 3
Other

Total Working Hours 159

Teachers
Type of Activity Name Qualifications Category
Theoretical Hugo David Nogueira Raposo PhD Equip. Prof. Adjunct
Theoretical-Practical Carlos Alberto da Rocha Lebres MSc Equip. Prof. Adjunct
Practical / Laboratory
Tutorial guidance
Project

Responsible Teacher Hugo David Nogueira Raposo

Learning Objectives / Outcomes and Competences

- Provide a systematic approach to the management of fixed assets or current assets of non-financial nature.
- Understanding the principles, concepts, methods, criteria and mechanisms related to the process of asset management.
- Plan and implement the strategic plan for the management of non-current assets.
- Understanding the operational dimensions, economic, financial and property decisions.
- Understanding the relevance of management accounting information in support of the asset management system and supporting decision making. Understand the concepts related to the appreciation and valuation of an asset.
- Understand and support investment decisions and financing instruments.

Study Plan

1. General Introduction
   Introduction to Asset Management. The Role of System Asset Management. Norms and Standards for Asset Management PAS-55 and ISO 5500x
   Family.
2. Acquisition, Development and Asset Management
3. Financial Analysis

Method of Teaching and Learning

The teaching methodologies use the lecture method, using the projection of slides, as well as deductive and inductive methods. The methodology also uses educational simulation processes. This means the teaching/learning process is performed in conditions close to business reality. Students will solve practical cases, which are similar to situations they will have in their professional life.
Bibliography

- Menezes, Caldeira - PRINCÍPIOS DE GESTÃO FINANCEIRA, Editorial Presença.
- Barros, Hélio – Análise de Projetos de Investimento, Edições Silabo, 4.ª Edição, 2002
  84882-750-9
- The slides used in the class will be available for downloading at the course website.

Conditions to attend the Course Unit

- According to the evaluation methodology and the general rules of ISEC.

Conditions to Access Examination

- According to the evaluation methodology and the general rules of ISEC.

Assessment Methodology

- The assessment integrates a final exam (45% “EX”), two individual written works (20% “RI”) and a group written works (35% “TG”).

\[ CF = 0.20 \times RI + 0.35 \times TG + 0.45 \times EX \]

- The evaluation of the course unit will be done by Final exam in the form of written test with a maximum duration of three hours.
- He passing of the course implies a minimum CF of 9.5 points.

Work done:

- A preliminary TG report must be submitted and submitted by April 15, 2019.
- TG must be delivered electronically and in paper form by May 13, 2019.
- The presentation and defense of the TG will begin on May 20, 2019.
- The first RI must be submitted by April 1, 2019 and the second RI until the last week of classes.

Conditions to Improve Classification

- According to the evaluation methodology and the general rules of ISEC.
- Individual and group written works.

Date

Feveruary, 05th 2019

Teacher responsible for the Unit Course

Hugo David Nogueira Raposo