240EO035 - Information Systems

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 732 - OE - Department of Management
Academic year: 2019
Degree: MASTER'S DEGREE IN MANAGEMENT ENGINEERING (Syllabus 2012). (Teaching unit Compulsory)
MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
MASTER'S DEGREE IN SUPPLY CHAIN, TRANSPORT AND MOBILITY MANAGEMENT (Syllabus 2014). (Teaching unit Optional)
ECTS credits: 6
Teaching languages: Spanish

Coordinator: RAMON SALVADOR VALLES
Others: RAMON SALVADOR VALLES

Degree competences to which the subject contributes

Basic:
CB9. (ENG) Que els estudiants sàpiguen comunicar les seves conclusions i coneixements (i darrers raonaments que els sostenint), a públics especialitzats i no especialitzats de manera clara i sense ambigüïtats.
CB10. (ENG) Que els estudiants poseeixin les habilitats d'aprenentatge que els permetin continuar estudiant d'una manera d'una forma que haurà de ser en gran mesura autodirigit o autonònom

Specific:
1. Manage activities with relevant content of projects and / or operations in the technology and the organization must interact effectively and efficiently.
2. Identify, analyze, diagnose, design and implement solutions in complex socio-technical systems.
3. CB4. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.
5. Apply theories and principles relating to technology and information systems in order to analyze complex situations and uncertainty, and make decisions using engineering tools.

Generical:
7. Know and understand the organization of a company and the sciences that define their activity, ability to understand business rules and relationships between planning, industrial and commercial strategies, quality and profit.

Transversal:

Teaching methodology

Lectures with active participation of students, where the teacher presents the theoretical and practical aspects of the subject.
Practical classes where students solve problems and assumptions, both individually and in groups, and teacher presents examples and answers questions.
Case method, where students, with teacher support, analyse the management and information systems applications in specific organizations, describe and assess the issues involved and the results obtained.

Learning objectives of the subject

At the end of the course students should be able to describe the environment of information systems (IS) as well as related information and communication technologies (ICT), and appreciate why information resources have to be managed in organizations. It should be described the knowledge and basic skills of discipline, using methodologies and
proprietary tools, and learning to learn in the context of matter.

<table>
<thead>
<tr>
<th>Study load</th>
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</thead>
<tbody>
<tr>
<td><strong>Total learning time:</strong> 150h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours large group:</td>
<td>27h</td>
<td>18.00%</td>
</tr>
<tr>
<td>Hours small group:</td>
<td>27h</td>
<td>18.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>96h</td>
<td>64.00%</td>
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</tbody>
</table>
## Content

### 1. Introduction to information systems

<table>
<thead>
<tr>
<th>Learning time: 19h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td>Practical classes: 3h</td>
</tr>
<tr>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

**Description:**
Concept of information system (IS) and its function. Information needs in organizations and the role of information system. Interaction between the information system and the organization. Categories of information systems. The information and communication technology (ICT). Impact of information systems and ICT in organizations. ICT and society.

**Related activities:**
Activity 1, 5, 6 and 7.

**Specific objectives:**
To describe the meaning of information system in the organisation.

### 2. Applications of information systems and technologies

<table>
<thead>
<tr>
<th>Learning time: 30h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td>Practical classes: 6h</td>
</tr>
<tr>
<td>Self study: 20h</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**
Activity 1, 5, 6 and 7.

**Specific objectives:**
To identify applications and technological solutions in organizations.
### 3. Strategic management for information systems and technologies

**Learning time:** 38h
- Theory classes: 9h
- Practical classes: 9h
- Self study: 20h

**Description:**
Strategy and ICT governance. The planning of IS and ICT. Evolution of the use of ICT and IS planning. Strategic Alignment of IS and ICT. Use of IS and ICT as a strategic resource. Organizational implications of the introduction of IS and ICT.

**Related activities:**
Activity 2, 3, 5 and 7.

**Specific objectives:**
To identify and describe information needs, and to manage IS and ICT at a strategic level.

### 4. Development and management of information systems

**Learning time:** 24h
- Theory classes: 6h
- Practical classes: 6h
- Self study: 12h

**Description:**

**Related activities:**
Activity 4, 5 and 7.

**Specific objectives:**
To identify and describe information needs, strategies and methods to developing and managing IS and ICT.

### 5. Evaluation of information systems investments

**Learning time:** 30h
- Theory classes: 5h
- Practical classes: 5h
- Self study: 20h

**Description:**

**Related activities:**
Activity 4, 5 and 7.

**Specific objectives:**
To evaluate the feasibility of IS and ICT projects.
### Planning of activities

<table>
<thead>
<tr>
<th>ACTIVITY 1. USING ICT AND IS IN ORGANISATIONS</th>
<th>Hours: 18h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Laboratory classes: 9h</td>
</tr>
<tr>
<td>Analysis of three cases of organizations to see how they use IS and ICT. Identifying technologies, their application to the development of information systems, the design of the processes and the impact on the organization.</td>
<td>Self study: 9h</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
<td>-------------</td>
</tr>
<tr>
<td>Description of cases and objectives, along with a guide of the activities to be performed and the slides of the course.</td>
<td></td>
</tr>
<tr>
<td><strong>Descriptions of the assignments due and their relation to the assessment:</strong></td>
<td></td>
</tr>
<tr>
<td>Individually written report, together with the resolution of questions raised during the sessions, in which cases are discussed.</td>
<td></td>
</tr>
<tr>
<td><strong>Specific objectives:</strong></td>
<td>-------------</td>
</tr>
<tr>
<td>To identify the role of IS in the organisation, and the implications that IS and ICT have.</td>
<td></td>
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<table>
<thead>
<tr>
<th>ACTIVITY 2. ICT OUTSOURCING</th>
<th>Hours: 6h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Laboratory classes: 3h</td>
</tr>
<tr>
<td>Analysis of a company that has outsourced all or part of the ICT area to determine: the outsourcing model between the company and the supplier, the service quality indicators and constraints.</td>
<td>Self study: 3h</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
<td>-------------</td>
</tr>
<tr>
<td>Description of cases, sheet with the description of the objectives, and a guide of things to do and the transparencies of the subject.</td>
<td></td>
</tr>
<tr>
<td><strong>Descriptions of the assignments due and their relation to the assessment:</strong></td>
<td></td>
</tr>
<tr>
<td>Individual report with the result of the analysis.</td>
<td></td>
</tr>
<tr>
<td><strong>Specific objectives:</strong></td>
<td>-------------</td>
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<tr>
<td>To describe the practices of ICT outsourcing by firms.</td>
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<table>
<thead>
<tr>
<th>ACTIVITY 3. IS/ICT STRATEGIC PLANNING</th>
<th>Hours: 18h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Laboratory classes: 6h</td>
</tr>
<tr>
<td>Application of a procedure for strategic planning of IS and ICT in a company, to prepare a plan for the strategic development of information technology and systems.</td>
<td>Self study: 12h</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
<td>-------------</td>
</tr>
<tr>
<td>Description of a case study with the guidance of the activities to be performed and the slides of the course.</td>
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</tr>
<tr>
<td><strong>Descriptions of the assignments due and their relation to the assessment:</strong></td>
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<tr>
<td>Reports at the group level with the proposed solution.</td>
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</table>
ACTIVITY 4. PROJECT DEVELOPMENT AND FEASIBILITY STUDY.

**Description:**
To perform two exercises on systems development, calculating return on investment and total cost of ownership for ICT solutions in an enterprise. It should be proposed a software solution from a particular provider and justify the choice.

**Support materials:**
Description of the exercises and objectives, as well as guides to conduct activities and course slides.

**Descriptions of the assignments due and their relation to the assessment:**
Individual or group report, as indicated, with the proposed solution and results.

**Specific objectives:**
To identify key strategic opportunities for ICT in a company, designing strategic actions based on IS / ICT, and proposing projects to be developed.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Laboratory classes: 5h</th>
<th>Self study: 10h</th>
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<tbody>
<tr>
<td>15h</td>
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ACTIVITY 5. ANALYSIS OF AN ICT APPLICATION.

**Description:**
Work done during the entire course consisting of a description and analysis of an innovative application of information technology and electronic communication in a particular case, describing the processes, technologies and the impact on the company.

**Support materials:**
Description of the objectives and the guidelines of the activities to be performed as well as the slides of the course are used.

**Descriptions of the assignments due and their relation to the assessment:**
Written report, together with an exhibition and defence, of the case resolution on the part of the group.

**Specific objectives:**
To describe the process of IS development and management as well as to determine the value of an IS solution for a company.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Laboratory classes: 4h</th>
<th>Self study: 25h</th>
</tr>
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<tbody>
<tr>
<td>29h</td>
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ACTIVITY 6. MID-TERM EXAM

**Description:**
Individual test and in writing on the contents of the topics 1 and 2.

**Support materials:**
Written text of the final test questions

<table>
<thead>
<tr>
<th>Hours</th>
<th>Laboratory classes: 1h</th>
<th>Self study: 9h</th>
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<tbody>
<tr>
<td>10h</td>
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</table>
ACTIVITY 7. FINAL EXAM

Description:
Individual test and in writing on the whole matter treated in the subject.

Support materials:
Written text of the final test questions.

Descriptions of the assignments due and their relation to the assessment:
On having finished the test programmed by the ETSEIB the answers will be delivered.

Specific objectives:
To value the degree that has been reached the assimilation of the concepts, principles and basic foundations, as well as the methods related to the topics treated in the subject.

Qualification system

The final mark is the weighted sum of:
\[ N_{\text{final}} = 0.6 \times N_{\text{ef}} + 0.2 \times N_{\text{pb}} + 0.1 \times N_{\text{tc}} + 0.1 \times N_{\text{pr}} \]
There is a partial test set, for items 1 and 2, under the following conditions: If \( N_{\text{pp}} \) is greater than \( N_{\text{ef}} \), then \( N_{\text{pp}} \) will be considered according to its weight.

The final mark including re-evaluation the weighted sum of:
\[ N_{\text{final}} = 0.6 \times N_{\text{er}} + 0.2 \times N_{\text{pb}} + 0.1 \times N_{\text{tc}} + 0.1 \times N_{\text{pr}} \]

\( N_{\text{final}} \): Final mark
\( N_{\text{ef}} \): Final exam mark
\( N_{\text{pp}} \): Mid-term exam mark
\( N_{\text{tc}} \): Activity 5 report mark
\( N_{\text{pb}} \): Exercises mark
\( N_{\text{pr}} \): Exhibition mark
\( N_{\text{er}} \): Re-evaluation mark

The final examination consists of a test with questions that have multiple response options, but only one valid, plus two exercises and / or essay questions. The approximate duration is two hours.

Regulations for carrying out activities

It is not admitted any reference materials during examinations. Examination tests are conducted in accordance with the timetable provided by the Centre.
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**Bibliography**

**Basic:**


**Complementary:**


**Others resources:**

Lectures slides.
Description of case studies, exercices and guides.