

## Course guide

### 240IOI34 - 240IOI34 - Information Systems

**Last modified:** 16/05/2023

**Unit in charge:** Barcelona School of Industrial Engineering  
**Teaching unit:** 732 - OE - Department of Management.

**Degree:** MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Optional subject).

**Academic year:** 2023    **ECTS Credits:** 4.5    **Languages:** Spanish

#### LECTURER

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**Coordinating lecturer:** RAMON SALVADOR VALLES

**Others:** RAMON SALVADOR VALLES

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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##### 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. Planning, organizing, implementing, leading and controlling engineering projects, especially projects of innovation (R + D + i) and process improvement.
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:

4. Acquire skills related to the design and management of complex organizations, including people management, financial aspects, production, project management, and allocation and distribution of resources for managers and management problems.
6. Acquire skills related to the design and management of complex organizations, including people management, financial aspects, production, project management, and allocation and distribution of resources for managers and management problems.
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.

#### TEACHING METHODOLOGY

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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

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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.

## STUDY LOAD

Type	Hours	Percentage
Hours medium group	27,0	24.00
Self study	72,0	64.00
Hours small group	13,5	12.00

**Total learning time:** 112.5 h

## CONTENTS

### 1. Introduction to information systems

**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.

**Specific objectives:**

To describe the meaning of information system in the organisation.

**Related activities:**

Activity 1, 5, 6 and 7.

**Full-or-part-time:** 19h

Theory classes: 6h

Practical classes: 3h

Self study : 10h

### 2. Applications of information systems and technologies

**Description:**

Information systems for: sales, logistics and production, human resources, administration and finance. Enterprise Resource Planning systems (ERP). Inter-organisational information systems. Electronic commerce. Decision support systems. Information systems for group work and knowledge management. Systems Integration.

**Specific objectives:**

To identify applications and technological solutions in organizations.

**Related activities:**

Activity 1, 5, 6 and 7.

**Full-or-part-time:** 30h

Theory classes: 4h

Practical classes: 6h

Self study : 20h

### 3. Strategic management for information systems and technologies

**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.

**Specific objectives:**

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

**Related activities:**

Activity 2, 3, 5 and 7.

**Full-or-part-time:** 38h

Theory classes: 9h

Practical classes: 9h

Self study : 20h

### 4. Development and management of information systems

**Description:**

Strategies for information systems development. The systems development life cycle. The structured analysis. Prototyping. Data and processes modelling. The implementation of IS and change analysis. The ICT governance. The ICT project management.

**Specific objectives:**

To identify and describe information needs, strategies and methods to developing and managing IS and ICT.

**Related activities:**

Activity 4, 5 and 7.

**Full-or-part-time:** 24h

Theory classes: 6h

Practical classes: 6h

Self study : 12h

### 5. Evaluation of information systems investments

**Description:**

The value of ICT. Methods of measuring information systems value. Cost - benefit analysis of information systems. Evaluation of costs and benefits. Methodology of analysis. Total cost of ownership (TCO). Optimal design of an IS. Analysis of risk. Assessing risk for a project. Project portfolio risk.

**Specific objectives:**

To evaluate the feasibility of IS and ICT projects.

**Related activities:**

Activity 4, 5 and 7.

**Full-or-part-time:** 30h

Theory classes: 5h

Practical classes: 5h

Self study : 20h

## ACTIVITIES

### ACTIVITY 1. USING ICT AND IS IN ORGANISATIONS

**Description:**

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.

**Specific objectives:**

To identify the role of IS in the organisation, and the implications that IS and ICT have.

**Material:**

Description of cases and objectives, along with a guide of the activities to be performed and the slides of the course.

**Delivery:**

Individually written report, together with the resolution of questions raised during the sessions, in which cases are discussed.

**Full-or-part-time:** 18h

Laboratory classes: 9h

Self study: 9h

### ACTIVITY 2. ICT OUTSOURCING

**Description:**

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.

**Specific objectives:**

To describe the practices of ICT outsourcing by firms.

**Material:**

Description of cases, sheet with the description of the objectives, and a guide of things to do and the transparencies of the subject.

**Delivery:**

Individual report with the result of the analysis.

**Full-or-part-time:** 6h

Laboratory classes: 3h

Self study: 3h

### ACTIVITY 3. IS/ICT STRATEGIC PLANNING

**Description:**

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.

**Specific objectives:**

Identify key strategic opportunities for ICT in a company, designing strategic actions based on IS / ICT, and proposing projects to be developed.

**Material:**

Description of a case study with the guidance of the activities to be performed and the slides of the course.

**Delivery:**

Reports at the group level with the proposed solution.

**Full-or-part-time:** 18h

Laboratory classes: 6h

Self study: 12h

#### 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.

**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.

**Material:**

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

**Delivery:**

Individual or group report, as indicated, with the proposed solution and results.

**Full-or-part-time:** 15h

Laboratory classes: 5h

Self study: 10h

#### 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.

**Specific objectives:**

To apply concepts developed during the academic period, in a practical, real case, of the nearby environment.

**Material:**

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

**Delivery:**

Written report, together with an exhibition and defence, of the case resolution on the part of the group.

**Full-or-part-time:** 29h

Laboratory classes: 4h

Self study: 25h

#### ACTIVITY 6. MID-TERM EXAM

**Description:**

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

**Specific objectives:**

To value the degree of assimilation of the concepts related to the basic aspects of IS, ICT and their use, in order to allow the self-evaluation of the student, and the follow-up of the teacher.

**Material:**

Written text of the final test questions

**Delivery:**

On having finished the test programmed by the ETSEIB the answers will be delivered.

**Full-or-part-time:** 10h

Laboratory classes: 1h

Self study: 9h

## ACTIVITY 7. FINAL EXAM

**Description:**

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

**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.

**Material:**

Written text of the final test questions.

**Delivery:**

On having finished the test programmed by the ETSEIB the answers will be delivered.

**Full-or-part-time:** 24h

Laboratory classes: 2h

Self study: 22h

## GRADING SYSTEM

The final mark is the weighted sum of:

$$N_{\text{final}} = 0,6 N_{\text{ef}} + 0,2 N_{\text{pb}} + 0,1 N_{\text{tc}} + 0,1 N_{\text{pr}}$$

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:

$$N_{\text{final}} = 0,6 N_{\text{er}} + 0,2 N_{\text{pb}} + 0,1 N_{\text{tc}} + 0,1 N_{\text{pr}}$$

$N_{\text{final}}$ : 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.

## EXAMINATION RULES.

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

## BIBLIOGRAPHY

**Basic:**

- Andreu, Rafael et al. Estrategia y sistemas de información. 1a ed. Madrid: McGraw-Hill, 1996. ISBN 8448105087.
- Salvador, R.; Guimet, J. Sistemes d'informació [on line]. 2a ed. Barcelona: Edicions UPC, 2003 [Consultation: 09/09/2022]. Available on: <https://upcommons.upc.edu/handle/2099.3/36263>. ISBN 8483015684.
- Salvador Vallés, Ramon. Notas de sistemas de información en las organizaciones. Barcelona: Imatge, 2012.

**Complementary:**

- O'Brien, James A et al. Sistemas de información gerencial. 3a ed. México: McGraw-Hill, 2006. ISBN 9701056302.
- Applegate, Lynda M et al. Corporate information strategy and management : text and cases. 8th ed. New York: McGraw-Hill, 2009.



ISBN 9780071263191.

- Laudon, Kenneth C. Sistemas de información gerencial [on line]. 14a ed. México: Pearson - Prentice Hall, 2016 [Consultation: 22/04/2020]. Available on: [http://www.ingebook.com/ib/NPcd/IB\\_BooksVis?cod\\_primaria=1000187&codigo\\_libro=6944](http://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6944). ISBN 9786073236966.

## RESOURCES

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### **Other resources:**

Lectures slides.

Description of case studies, exercises and guides.