



## Course guide

# 270162 - ASMI - Social and Environmental Issues Od Information Technologies

Last modified: 11/07/2025

**Unit in charge:** Barcelona School of Informatics  
**Teaching unit:** 747 - ESSI - Department of Service and Information System Engineering.

**Degree:** BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN DATA SCIENCE AND ENGINEERING (Syllabus 2017). (Optional subject).

**Academic year:** 2025    **ECTS Credits:** 6.0    **Languages:** Catalan

### LECTURER

**Coordinating lecturer:** MARÍA JOSÉ CASAÑ GUERRERO  
**Others:** Primer quadrimestre:  
MARC ALIER FORMENT - 10  
MARÍA JOSÉ CASAÑ GUERRERO - 10

### PRIOR SKILLS

Interest in computing, its impact and history

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

#### Specific:

CT3.6. To demonstrate knowledge about the ethical dimension of the company: in general, the social and corporative responsibility and, concretely, the civil and professional responsibilities of the informatics engineer.  
CT3.7. To demonstrate knowledge about the normative and regulation of informatics in a national, European and international scope.

#### General:

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.  
G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

### TEACHING METHODOLOGY

The specific organization of these 6 credits (four hours of class per week in a semester) aims to combine professorial lectures and practical work assessed throughout the course. It is necessary to work continuously throughout the semester, making class attendance essential.



## LEARNING OBJECTIVES OF THE SUBJECT

1. Knowledge about legal issues arising from the use of computing, and the legislation in force and its impact on professionals.
2. Ability to cope with ethical issues and codes of practice in the computing field, the impact of computing on the environment, and the issue of sustainable development in today's world.
3. Knowing how to make public presentations on the historic, social and environmental aspects of computing.
4. Knowing how to write essays on computing and its social and environmental impact.
5. Ability to study and analyze problems in a critical mood.
6. Ability to critically read texts on computing, its impact and history.
8. Ability to analyze the social and environmental impact of science and technology with particular reference to computing and problems of sustainable development.

## STUDY LOAD

| Type               | Hours | Percentage |
|--------------------|-------|------------|
| Hours large group  | 30,0  | 20.00      |
| Hours medium group | 30,0  | 20.00      |
| Self study         | 84,0  | 56.00      |
| Guided activities  | 6,0   | 4.00       |

**Total learning time:** 150 h

## CONTENTS

### Society and technological change

#### Description:

- 1.1 Science and technology
- 1.2 The process of technological change
- 1.3 The diffusion of technology
- 1.4 The technology and its creators
- 1.5 The organization and technological change

### Social aspects of computing

#### Description:

- 2.1 The acceleration of technological change and its effects
  - The multiplier factor of ICT
  - Moore's Law
  - Metcalfe's law
  - Law of Fracture (Negroponte)
  - Gartner's hype curve
  - Conway law
- 2.2 Some social and economic aspects of ICT
  - The future of work
  - Exponential organizations
  - Vigilance Capitalism
  - Social aspects of the application of machine learning algorithms



### ICT's environmental aspects

**Description:**

- 3.1 Computers and the Environment
- 3.2 The problem of computer waste
- 3.3 Computing and sustainability,

### The computing professional: ethics and duties

**Description:**

- 4.1 The IT profession
- 4.2 Why is it important to study ethics?
- 4.3 Ethics, moral, culture and values
- 4.4 Ethical theories
- 4.5 Ethics and professional ethics in computing
- 4.6 Deontological codes in computing

### Computing Law: the legislation affecting computing professionals

**Description:**

- 5.1 Computers and Law: fraud and computer crimes
- 5.2 The legal protection of personal data (LPDP)
- 5.3 The legal protection of software
- 5.4 Laws on Internet (LSSICE)

### General history of computing

**Description:**

- 6.1 The specificity of the history of computing
- 6.2 Historical Background
  - The mechanical calculators and analogue
  - Projects of C. Babbage
  - The tabs
- 6.3 The proto-electromechanical computers
- 6.4 The first electronic computer: the Von Neumann architecture
- 6.5 - The computers of the classical computer
- 6.6 - Evolution of technology and software
- 6.7 - Mini and micro
- 6.8 - History of the Internet
- 6.9 - History of artificial intelligence



## ACTIVITIES

### Development of theme 1: society and technology changes

**Description:**

In the lectures of the professor, students listen respectfully, take notes and ask questions to clarify doubts. In sessions in which some students do presentations, most students follow the same task when there are lectures by teacher; while students who are presenting the subject, had to prepare it, if necessary with help from the teacher, and expose the subject to the class with the aid of some presentation tools (Impress, Powerpoint, etc..), after having prepared also a text summary of the subject (both text and presentation, must be in possession of the teacher with, at least, one day in advance of the meeting presentation).

**Specific objectives:**

5, 8

**Related competencies :**

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

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

Self study: 2h

Theory classes: 4h

### Development of theme 2: Social aspects of Computing

**Description:**

In the lectures of the professor, students listen respectfully, take notes and ask questions to clarify doubts. In sessions in which some students do presentations, most students follow the same task when there are lectures by teacher; while students who are presenting the subject, had to prepare it, if necessary with help from the teacher, and expose the subject to the class with the aid of some presentation tools (Impress, Powerpoint, etc..), after having prepared also a text summary of the subject (both text and presentation, must be in possession of the teacher with, at least, one day in advance of the meeting presentation).

Students prepare and study a case study with the help, if necessary, of the teacher, and deliver the answers to questions proposed by the teacher.

**Specific objectives:**

3, 5, 6, 8

**Related competencies :**

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

**Full-or-part-time:** 28h

Self study: 18h

Theory classes: 6h

Practical classes: 4h



### Development of Theme 3: Environmental aspects of the infotecnologies

#### Description:

In the lectures of the professor, students listen respectfully, take notes and ask questions to clarify doubts. In sessions in which some students do presentations, most students follow the same task when there are lectures by teacher; while students who are presenting the subject, had to prepare it, if necessary with help from the teacher, and expose the subject to the class with the aid of some presentation tools (Impress, Powerpoint, etc..), after having prepared also a text summary of the subject (both text and presentation, must be in possession of the teacher with, at least, one day in advance of the meeting presentation).

Students prepare and study a case study with the help, if necessary, of the teacher, and deliver the answers to questions proposed by the teacher.

#### Specific objectives:

2, 3, 5, 6, 8

#### Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

#### Full-or-part-time: 14h

Self study: 8h

Theory classes: 4h

Practical classes: 2h

### Development of item 4: The profession: ethics and professional responsibility

#### Description:

In the lectures of the professor, students listen respectfully, take notes and ask questions to clarify doubts. In sessions in which some students do presentations, most students follow the same task when there are lectures by teacher; while students who are presenting the subject, had to prepare it, if necessary with help from the teacher, and expose the subject to the class with the aid of some presentation tools (Impress, Powerpoint, etc..), after having prepared also a text summary of the subject (both text and presentation, must be in possession of the teacher with, at least, one day in advance of the meeting presentation).

Students prepare and study a case study with the help, if necessary, of the teacher, and deliver the answers to questions proposed by the teacher.

#### Specific objectives:

2, 3, 5, 8

#### Related competencies :

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

#### Full-or-part-time: 22h

Self study: 12h

Theory classes: 6h

Practical classes: 4h



### Development of item 5: Computer Law: laws affecting computer professionals

**Description:**

In the lectures of the professor, students listen respectfully, take notes and ask questions to clarify doubts. In sessions in which some students do presentations, most students follow the same task when there are lectures by teacher; while students who are presenting the subject, had to prepare it, if necessary with help from the teacher, and expose the subject to the class with the aid of some presentation tools (Impress, Powerpoint, etc..), after having prepared also a text summary of the subject (both text and presentation, must be in possession of the teacher with, at least, one day in advance of the meeting presentation).

**Specific objectives:**

1, 3, 5, 6, 8

**Related competencies :**

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

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

Self study: 10h

Theory classes: 4h

Practical classes: 4h

### Development of item 6: General History of computing

**Description:**

While some students are making presentations or the teaching staff is explaining, most students continue listening respectfully and taking notes. They can also contribute to the topic that is being discussed.

**Specific objectives:**

3, 5, 6, 8

**Related competencies :**

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

**Full-or-part-time:** 28h

Self study: 20h

Theory classes: 4h

Practical classes: 4h



### Book report about the units of the program

**Description:**

Reading, study and presentation by student

**Specific objectives:**

4, 5, 6, 8

**Related competencies :**

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

G4. EFFECTIVE ORAL AND WRITTEN communication: To communicate with other people knowledge, procedures, results and ideas orally and in a written way. To participate in discussions about topics related to the activity of a technical informatics engineer.

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

Self study: 12h

Practical classes: 6h

### Vision and discussion about some ad hoc documentaries

**Description:**

Visualization of the documentary, discussion in small groups, writing down each group with the ideas that are highly suggestive or main for the documentary. Each group must present a document delivering the list of the main ideas suggested by the documentary. Individually, each student will submit a document with his critical opinion on the documentary.

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

Practical classes: 6h

### Final exam

**Description:**

Final exam

**Specific objectives:**

1, 2, 5, 6, 8

**Related competencies :**

G2. SUSTAINABILITY AND SOCIAL COMPROMISE: to know and understand the complexity of the economic and social phenomena typical of the welfare society. To be capable of analyse and evaluate the social and environmental impact.

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

Self study: 8h

Guided activities: 2h



## GRADING SYSTEM

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The final mark of this course is calculated following one of the next methods:

1) Final Mark = CA

or

2) Final Mark=  $\max(FE, (0.5*FE+0.5*CA))$

where CA= Continuous Assesment and FE =Final Exam

The CA mark is calculated as follows:

30% - grade from the history of computing bloc

30% - grade from the social, environmental, and legal aspects block

30% - grade from the ethics deliverables

10% - active participation in classes during the course

To be evaluated by CA (and the final mark is calculated following method 1) Final Mark= CA), a student must have delivered a minimum of 75% of the deliverables from all the previous blocks.

In the event that in one of the parts of the continuous assesment the minimum required is not delivered, this part is considered not submitted and the corresponding mark will be zero.

In the case of not following CA, the student will have to do FE. Then, her final mark is calculated using 2), that is, Final Mark=  $\max(FE, (0.5*FE+0.5*CA))$

Transversal competences are assessed:

Sustainability and social commitment: based on specific topics already included in the syllabus on these aspects and, in addition, based on interventions/submissions in class debates.

Effective oral and written communication: based on the activities carried out by the student:

Written communication: the text of assignments such as cases, exercises, and reports.

Oral communication: with the presentations made in class by the students.

## BIBLIOGRAPHY

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