Course guide
2707370 - RAI - Responsible Artificial Intelligence

Unit in charge:	Barcelona School of Informatics
Teaching unit:	723 - CS - Department of Computer Science.

Degree:	MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE (Syllabus 2017). (Optional subject).

Academic year: 2025 **ECTS Credits:** 3.0 **Languages:** English

LECTURER

Coordinating lecturer: CLAUDIO ULISES CORTÉS GARCÍA

Others:

PRIOR SKILLS

We require the student to be knowledgeable on:

* Processes for developing large and complex software systems
* Roles and technologies to help you control such projects
* Research-level issues in areas such as software engineering, information systems, simulation modelling, digital media and games, network computing and artificial intelligence.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEP3. Capacity for applying Artificial Intelligence techniques in technological and industrial environments to improve quality and productivity.
CEP4. Capability to design, write and report about computer science projects in the specific area of ??Artificial Intelligence.
CEP5. Capability to design new tools and new techniques of Artificial Intelligence in professional practice.
CEP7. Capability to respect the legal rules and deontology in professional practice.
CEP8. Capability to respect the surrounding environment and design and develop sustainable intelligent systems.

Generical:
CG1. Capability to plan, design and implement products, processes, services and facilities in all areas of Artificial Intelligence.

Transversal:
CT1. ENTREPRENEURSHIP AND INNOVATION: Capability to know and understand a business organization and the science that defines its activity; capability to understand the labor rules and the relations between planning, industrial and commercial strategies, quality and profit.
CT2. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.

CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

CT4. 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.

CT6. REASONING: Capability to evaluate and analyze on a reasoned and critical way about situations, projects, proposals, reports and scientific-technical surveys. Capability to argue the reasons that explain or justify such situations, proposals, etc..

TEACHING METHODOLOGY

There it will be invited speakers from the industry --at least 4-- and up to 7 case studies of Artificial Intelligence Industrial applications.
The format will be a seminar with direct participation and reporting tasks.

LEARNING OBJECTIVES OF THE SUBJECT

1.To identify the AI technologies, tools, architectures, and algorithms best suited for industrial applications, ensuring that these solutions rigorously uphold the principles of Responsible Artificial Intelligence, including ethics, transparency, fairness, accountability, and fully comply with legal requirements, societal norms, and gender equality standards.
2.To be able to develop a set of criteria for AI-based applications development, and evaluate each of the identified applications in terms of these criteria
3.To make short- and long-term ethical recommendations for the industrial AI applications development and work in a multidisciplinary team

STUDY LOAD

Type	Hours	Percentage
Self study	48,0	64.00
Hours large group	13,5	18.00
Hours medium group	13,5	18.00

Total learning time: 75 h

CONTENTS

Responsible AI

Description:
This part of the seminar introduces the foundational principles of Responsible AI, emphasising ethical considerations and the responsible use of AI technologies across industries. It explores key topics such as fairness, transparency, accountability, and compliance with legal and societal standards, equipping participants to design and deploy AI-based systems that respect human rights and promote trust.

Face to face with the Artificial Intelligence Industrial Applications

Description:
AI-based technologies are transforming the business landscape, with their applications spanning management, administration, science, engineering, manufacturing, finance, law, defence, space exploration, medicine, and diagnostics. Senior managers increasingly rely on AI-driven strategic planning tools for competitive analysis, technology deployment, and resource allocation. AI also supports equipment configuration, product distribution, regulatory compliance, and personnel assessment, significantly enhancing organisational planning and operational control. As AI technologies continue to evolve, their influence in science and engineering continues to grow even stronger.
In this segment of the seminar, students will critically examine controversial or ethically questionable AI applications currently used in various industries, fostering a deeper understanding of both the potential and the challenges of AI in business contexts.

Introduction to Human Rights

Description:
This part of the seminar introduces the relationship between human rights and artificial intelligence, highlighting how ethical AI development must prioritise dignity, fairness, privacy, and accountability to ensure technology benefits all and safeguards fundamental freedoms

ACTIVITIES

Examples of Industrial Applications of Artificial Intelligence from R&D

Description:
The Artificial Intelligence applications developed for science and engineering are used to organize and manipulate the ever-increasing amounts of information available to scientists and engineers. The Artificial Intelligence is used in complex processes and it is the increased use of robotics in business.

In this part of the seminar we will study edge applications of Artificial Intelligence born as R&D results. Most of the examples will come from European Union funded research.

Specific objectives:
1, 2, 3

Related competencies :
CEP5. Capability to design new tools and new techniques of Artificial Intelligence in professional practice.
CEP3. Capacity for applying Artificial Intelligence techniques in technological and industrial environments to improve quality and productivity.
CEP8. Capability to respect the surrounding environment and design and develop sustainable intelligent systems.
CEP4. Capability to design, write and report about computer science projects in the specific area of ??Artificial Intelligence.
CEP7. Capability to respect the legal rules and deontology in professional practice.
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Full-or-part-time: 43h
Theory classes: 18h
Self study: 25h

Introduction

Description:
The student will learn the objectives of this seminar. He will receive the materials and learn the calendar of activities.

Full-or-part-time: 34h
Theory classes: 6h
Self study: 28h

GRADING SYSTEM

Participants will submit a couple of essays during the course. There will be a single grade for the essays and for the final exam. The final exam will count for 60% of the grade.