Course guide
270688 - I2P - Interdisciplinary Innovation Project

Last modified: 02/02/2024

Unit in charge: Barcelona School of Informatics
Teaching unit: 701 - DAC - Department of Computer Architecture.

Degree: MASTER'S DEGREE IN INNOVATION AND RESEARCH IN INFORMATICS (Syllabus 2012). (Optional subject).
MASTER'S DEGREE IN DATA SCIENCE (Syllabus 2021). (Optional subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** English

LECTURER

Coordinating lecturer: JOSEP LLUÍS BERRAL GARCÍA

Others:

PRIOR SKILLS

None.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEE1.1. Capability to understand and know how to apply current and future technologies for the design and evaluation of interactive graphic applications in three dimensions, either when priorizing image quality or when priorizing interactivity and speed, and to understand the associated commitments and the reasons that cause them.
CEE2.1. Capability to understand models, problems and algorithms related to distributed systems, and to design and evaluate algorithms and systems that process the distribution problems and provide distributed services.
CEE3.1. Capability to identify computational barriers and to analyze the complexity of computational problems in different areas of science and technology as well as to represent high complexity problems in mathematical structures which can be treated effectively with algorithmic schemes.
CEE4.1. Capability to analyze, evaluate and design computers and to propose new techniques for improvement in its architecture.
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Generical:
CG1. Capability to apply the scientific method to study and analyse of phenomena and systems in any area of Computer Science, and in the conception, design and implementation of innovative and original solutions.
CG2. Capability to lead, plan and supervise multidisciplinary teams.
CG4. Capacity for general and technical management of research, development and innovation projects, in companies and technology centers in the field of Informatics Engineering.

Transversal:
CTR1. ENTREPRENEURSHIP AND INNOVATION: Capacity for knowing and understanding a business organization and the science that rules its activity, capability to understand the labour rules and the relationships between planning, industrial and commercial strategies, quality and profit. Capacity for developping creativity, entrepreneurship and innovation trend.
CTR3. TEAMWORK: Capacity of being able to work as a team member, either as a regular member or performing directive activities, in order to help the development of projects in a pragmatic manner and with sense of responsibility; capability to take into account the available resources.

Basic:
CB9. Possession of the learning skills that enable the students to continue studying in a way that will be mainly self-directed or autonomous.

TEACHING METHODOLOGY

To meet the objectives of the course, the methodology is based on the idea of hands- on, experiential learning. This will be combined with lectures, that provide framework and specific technical inputs for the work. The teaching during the course is shared between UPC (FIB, ETSETB) and ESADE faculty. You will receive class sessions and workshop by both business and engineering faculty, on both business and engineering -related topics.

However, the main emphasis is (and most time is spent) on learning through solving a real-life challenge and applying previously learned concepts and methods to this challenge. The methodological approach is designed to foster active learning and the implementation of the knowledge you have gained from previous courses of the degree, as well as the lectures of this course. You are expected to connect and utilize concepts and insights from previous courses in your studies, such as creative thinking, opportunity exploration, business models, and innovation management, among others.

You will work on the challenge on a weekly basis, following a continuously revised project plan you prepare during the kick-off week (with the help of the course faculty). Autonomous team work is the cornerstone of the entire course. However, this does not mean you work alone: you will have the course faculty and your own coach to support you at any time.

LEARNING OBJECTIVES OF THE SUBJECT

1.Know how to apply previous acquired technical knowledge in a real-world case in a multi-disciplinary team
2.Ability to communicate clearly and argue for decisions made in an innovation project
3.To lead your own work in an independent, proactive manner
4.To lead work in an explorative project which requires constant reflection and adaptation to new information acquired
5.Develop a prototype of an innovation project.

STUDY LOAD

Type	Hours	Percentage
Hours small group	24,0	16.00
Self study	96,0	64.00
Guided activities	6,0	4.00
Hours large group	24,0	16.00

Total learning time: 150 h

CONTENTS

Kick-off Week

Description:
This week focuses on getting each team started with their challenge and project work. During the week, teams will go once through the full process of understanding the challenge to proposing and testing a solution. The objective is to give the team a kick- start to the project, create a shared understanding of what the project is about and establish a good starting point for the teamwork itself. The week is rather tightly programmed. There are class sessions, facilitated workshops and time for teamwork on given assignments. The class sessions and workshops are delivered by different members of the course faculty, and you will be provided a detailed program of the week in advance.
The class sessions and workshops of the kick-off week include:
1. Workshop: Foundations for successful teamwork
2. Class: Introductory module to Design Thinking (for UPC students)
3. Class: Engineering 101 (for ESADE students)
4. Class: Benchmarking as opportunity identification
5. Workshop: Idea Generation
6. Class: Project management (Classic & Exploratory Projects)
7. Class: Prototyping, Testing, and making sense of the Results
8. Workshop: Preparing a Project Plan for I2p
9. Class: Introductory module to the 3.0 Corporation ethical assessment model.

Each team will also meet with the company representatives of their challenge during the week.
On the last day of the kick-off week, we will have the first Checkpoint Presentations.

Weekly Team-Work

Description:
Outside of the two intensive weeks (kick-off week and mid-term intensive week) teams carry out independent teamwork, based on the project plan prepared in the kick-off week and advice provided by the coach. For the preparation of the project plan, each team is given instructions and guidance during the kick-off week. This plan is reviewed and adapted in the coaching sessions, together with the coach.

Coaching Session

Description:
Each team has their own coach, whose objective is to support and guide the team throughout the course. The coach will also attend the final presentation and provide feedback on the final deliverables. The coaches are experienced practitioners working in the field of innovation and collaborators of UPC and ESADE. They have been chosen based on their experience in the type of projects I2P represents and have all been trained for the requirements of I2P.
Each coaching session is a one-on-one session with the coach, and lasts one hour. This means that both teams working on the same challenge will have their own, separate coaching session. There are four rounds of coaching during the course:
1st coaching session: Wednesday 7.3.
2nd coaching session: Wednesday 21.3.
3rd coaching session: A date of your choice during the period of 23.4.4.5. (the PM of each team will handle the agreeing of the date)
4th coaching session: A date of your choice during the period of 7.5.-18.5. (the PM of each team will handle the agreeing of the date)

For the coaching sessions, the teams should arrive prepared to give a short update on their project (what has happened since the last encounter, what have you learned, what doubts and questions you have, etc.). Consider the coaching session a time that the coach is dedicated to help you move forward and make most out of that time. The coaching will also monitor the ethical and environmental dimension of the solutions designed.

Technical Coaching

Description:
Each team is also supported by a technical coach, his/her goal is to provide advice and guidance regarding the feasibility and prototyping of the technical approach. Technical coaches are experts from UPC in the relevant field of the challenge.

Mid-term Week

Description:
The mid-term intensive week focuses on creating and testing prototype(s). You will receive the assignment for the week on Monday morning.
This week is significantly less structured and programmed compared with the kick-off week. We will have class sessions each morning of the week. These class sessions focus on technologies and themes that are central to the solutions the teams are developing. Therefore, we will only define these sessions few weeks prior to the mid-term intensive (once we know what direction your projects are taking). Besides the class sessions, the rest of the week is dedicated to teamwork on the given assignment.
On Friday of the mid-term intensive all teams will present their prototype and results from testing in the Prototype Expo. Here, we will have the chance to view all projects and their prototypes. This activity counts as the second Checkpoint Presentation.

Rehearsal and Final Presentation

Description:
This activity represents a rehearsal of the final presentation as well as the final presentation to key people of case-owner. The rehearsal is performed in front of the other teams, coaches and profs.

ACTIVITIES

Kick-off Week

Description:
(See content)

Specific objectives:
1, 2

Related competencies :
CG4. Capacity for general and technical management of research, development and innovation projects, in companies and technology centers in the field of Informatics Engineering.
CG2. Capability to lead, plan and supervise multidisciplinary teams.
CG1. Capability to apply the scientific method to study and analyse of phenomena and systems in any area of Computer Science, and in the conception, design and implementation of innovative and original solutions.
CEE2.1. Capability to understand models, problems and algorithms related to distributed systems, and to design and evaluate algorithms and systems that process the distribution problems and provide distributed services.
CEE1.1. Capability to understand and know how to apply current and future technologies for the design and evaluation of interactive graphic applications in three dimensions, either when priorizing image quality or when priorizing interactivity and speed, and to understand the associated commitments and the reasons that cause them.
CEE4.1. Capability to analyze, evaluate and design computers and to propose new techniques for improvement in its architecture.
CEE3.1. Capability to identify computational barriers and to analyze the complexity of computational problems in different areas of science and technology as well as to represent high complexity problems in mathematical structures which can be treated effectively with algorithmic schemes.
CEE5.1. Capability to participate in improvement projects or to create service systems, providing in particular: a) innovation and research proposals based on new uses and developments of information technologies, b) application of the most appropriate software engineering and databases principles when developing information systems, c) definition, installation and management of infrastructure / platform necessary for the efficient running of service systems.
CTR1. ENTREPRENEURSHIP AND INNOVATION: Capacity for knowing and understanding a business organization and the science that rules its activity, capability to understand the labour rules and the relationships between planning, industrial and commercial strategies, quality and profit. Capacity for developping creativity, entrepreneurship and innovation trend.
CB9. Possession of the learning skills that enable the students to continue studying in a way that will be mainly self-directed or autonomous.

Full-or-part-time: 38h
Theory classes: 9h
Laboratory classes: 9h
Self study: 20h

Weekly Team-Work

Description:
See content

Specific objectives:
3, 4

Related competencies :
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Full-or-part-time: 68h
Self study: 68h

Coaching Session

Description:
See content

Specific objectives:
2, 3, 4

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Full-or-part-time: 3h
Guided activities: 3h

Technical Coaching

Description:
See content

Specific objectives:
1, 3, 4, 5

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Full-or-part-time: 15h
Laboratory classes: 9h
Guided activities: 6h

Mid-term week

Description:
See content

Specific objectives:
1, 2, 3, 4, 5

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CG2. Capability to lead, plan and supervise multidisciplinary teams.
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CB9. Possession of the learning skills that enable the students to continue studying in a way that will be mainly self-directed or autonomous.

Full-or-part-time: 35h
Theory classes: 6h
Laboratory classes: 9h
Guided activities: 20h

Rehersal and Final Presentation

Description:
See content

Specific objectives:
1, 2, 3, 4, 5

Related competencies :
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Full-or-part-time: 3h
Guided activities: 3h

GRADING SYSTEM

The Process = 60%

The quality of the process (research, idea development, prototyping, testing, iteration) each team goes through is the most significant point for evaluation. This accounts for 55% of the grade.
What we evaluate here, is the team's ability to lead the project through a well-argued learning process, both in the problem- as well as in the solution space. Some of the criteria for evaluating the process of the team: Is the team aware of the choices they make in the project? Are the choices and decisions well-grounded in evidence? Is the team aware of uncertainties or assumptions that are present in the project? Does the team manage well the time available?

The Outcome = 30%
The evaluation of the outcome is based on 1) the final solution proposed by the team,
2) final presentation of the project, and 3) the final reporting. This accounts for 25% of the grade. Each team will deliver a final presentation and final reporting of their project to the case owner. Instructions for the final presentation are provided in the course website. The final reporting consists of 1) a written report, 2) a video, and 3) the demo. More detailed instructions and mode for delivery are provided in the course website.

Some of the criteria for evaluating the output of the project
1) Final solution: Relevance of the chosen need? Impact of the solution (how well if responds to the challenge and the identified need)? Originality of the solution?
2) Final presentation: Clarity in communicating the project's main aspects?
3) Final deliverable: How well does it represent the work done in the project? How well it takes into account its audience (the case owner)? Does the report deliver a concise and logical story and sufficient evidence to back up the case?
The organization that launched the challenge will also be heard for the evaluation of the project outcome, and this will be taken into account when forming the grade for the outcome.

Individual Participation = 10%

The evaluation of the individual participation to the project work consists of two components: 1) coach's evaluation of individual contribution as observed during the coaching sessions, and 2) an optional peer evaluation.
The project-work is a team-task. Team members will get the same grade for project- related work, but this will be either raised or lowered based on the differences in individual participation in the project work.
The team's coach will observe individual participation during coaching sessions. Some
of the criteria for evaluation individual participation:
· Active involvement in the discussion during the coaching session: does the participant engage in the group discussion?
· Active interaction with other team members. Does the participant listen to the team mates and build on others' contribution?
· Is the participant prepared and show evidence of participation in the assignments outside of the class sessions?
Team members can choose to carry out a peer-evaluation if they feel that contribution to the team effort was substantially different. If you feel that the input of one or more team- members was substantially less than average, please inform us by email. We will keep this email confidential yet call on each group member to provide a peer evaluation. Please note, however, that part of the team learning outcome is to work with members with different levels of aspirations, abilities, ideas, etc. Hence, try to solve problems internally. The call for peer evaluation is meant to be a last resort if prior efforts did not succeed.

BIBLIOGRAPHY

Basic:
- Furr, N.; Dyer, J. The innovator's method: bringing the lean startup into your organization. Boston: Harvard Business Review Press, 2014. ISBN 9781625271471.