UAB
Universitat Autònoma de Barcelona

2020/2021

Application Design and Project Management

Code: 43850
ECTS Credits: 6

Degree	Type	Year	Semester
4315985 Geoinformation	OB	0	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Teachers

Ramon Grau Sala

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Use of Languages

Principal working language: spanish (spa)

Prerequisites

Students must not have taken any course previously. However, to follow this course they should have:

- Ability to communicate both writen and spoken.
- Good level of Catalan, Spanish and English, so they have good understanding of readings and talks in all three languages
- Good level in using office software, particularly of worksheet, text and presentation software, either MS or free software.

Objectives and Contextualisation

This is a common course for the two master's specialties. It covers two different but complementary methodological fields.

On one hand, it provides the skills that are needed for the analysis and design of customized end user applications including the different methods for software development (Waterfall, Prototyping, Incremental, Agile, Scrum, among others) that cover analysis of users / organizations needs, functional and non functional requirements analysis, use cases development, applications functional design, graphical user interfaces design, assessment of technological alternatives for implementation, planning the development and programming fases of the application, debugging and testing, and monitoring the application thorugh its life cycle.

On the other hand, students will learn the methodologies for design, management and strategic and executive planning of projects, inluding project definition (goals and contents), implementation strategies, risk and contingency analysis, scheduling, budget devising, cost/benefit analysis (both direct and intangible benefits) and human, economic and technical resources management. This part also includes the knowledge of the tools, means and resources for technology transfer and for R+D activities support.

In both parts, the course focuses on the analysis and design of applications and projects with geospatial content. Therefore it includes also topics on quality assessment and geospatial information policies in international, national and local contexts.

Competences

- Analyze user needs and the formal and interface requirements to define and design end- user geospatial applications in corporate environments or those open to the public.
- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
- Continue the learning process, to a large extent autonomously.
- Design and manage geospatial information application products or services.
- Design intelligent applications of geospatial information for managing cities and region (smart cities) and for managing their implementation.
- Develop and apply monitoring and evaluation procedures for geoinformation products and services.
- Direct and manage geospatial information systems, services, products and applications projects, from a strategic, technical, economic and human resources and materials angle.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

Learning Outcomes

1. Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
2. Continue the learning process, to a large extent autonomously.
3. Develop procedures to evaluate the level of introduction of geoinformation products and services.
4. Direct and manage geospatial information systems, services, products and applications projects, from a strategic, technical, economic and human resources and materials angle.
5. Generate and manage projects organised by content criteria.
6. Identify and systematise the requirements and needs of users of geoinformation in a determined operative and organisational context.
7. Know and apply the functional-design methodologies for end-user geospatial applications.
8. Know and apply the methodologies for analysing the functional and non-functional requirements of geospatial applications in corporate environments or environments open to the public.
9. Know the principles of usability, ergonomics and human-computer interaction and their application to user-interface design.
10. Manage the human, technical and material resources for executing projects to produce and distribute geospatial information products or services.
11. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
12. Write and manage R&D projects in the field of smart city management.

Content

Project design and management

1. Project definition.

2. Strategic plans.

3. Methods for project planning and monitoring.

4. Risks and contingencies analysis.

5. Viability analysis.

6. Cost benefit anaysis

7. R+D+I projects.

8. Quality assessment systems.

Geoapplications analysis and design

1. Introduction.

    Definition and goals of software engineering.

    Definition of software.

2. Software life cycle.

3. Software development methods.

    Waterfall.

    Prototyping.

    Incremental.

    Agile.

    Scrum.

4. Application requirements analysis.

    Functional requirements.

    Non functional requirements.

5. Application functional design.

    Flow diagrams.

    Use cases.

6. Graphical user interface design.

7. Planning and monitoring software development projects.

8. Case studies.

9. Documentation writing.

Methodology

Learning is achieved by means of three types of activities.

Directed activities: Directed activities are theoretical and practical lectures in a computer lab. They include solving case studies and practical exercises, using as the main method a problem based learning approach and discussion seminars to consolidate knowledge by presenting, solving and discussing related problems. Lectures serve to systematize all the content, to present the state of the art of the different subjects, to provide methods and techniques for specific tasks, and to sum up the knowledge to learn. Lectures organize also the autonomous and complementary work done by the students.

Supervised activities: Supervised activities are focused on the execution of a semester project, consisting of a real case study, carried out through workshop hours, autonomous work and tutorials. This semester project allows to apply together all the knowledge and technical skills learnt in all the courses of the semester. The semester project is a milestone for the students and the actual demonstration that they had achieved the

learning goals of all the courses of the semester. It is also the main evidence for evaluation as students should have to submit at the end of the semester a report that summarizes the whole project and do an oral presentation.

Autonomous activities: Autonomous work of the students includes personal readings (papers, manuals, relevant reports, etc.), data and documentation search, complementary exercises and the personal development of the semester project.

The activities that could not be done onsite will be adapted to an online format made available through the UAB's virtual tools. Exercises, projects and lectures will be carried out using virtual tools such as tutorials, videos, Teams sessions, etc. Lecturers will ensure that students are able to access these virtual tools, or will offer them feasible alternatives.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	36	1.44	9, 7, 8, 11
Type: Supervised			
Semester project, exercises, seminars	15	0.6	10, 1
Type: Autonomous			
Personal work	69	2.76	5, 10, 2

Assessment

In the event that assessment activities cannot be taken onsite, they will be adapted to an online format made available through the UAB's virtual tools (original weighting will be maintained). Homework, activities and class participation will be carried out through forums, wikis and/or discussion on Teams, etc. Lecturers will ensure that students are able to access these virtual tools, or will offer them feasible alternatives.

CONTINUOUS EVALUATION

a) Evaluation procedure and activities:

Evaluation of the course is based mostly on the semester project, that comprises two evaluation activities. The elaboration and submission of a synthesis report and the oral presentation of the project done. Given the planning and management content of the course and the dynamic based on team work for solving cases and discussion seminars, the weight assigned to the project report is 30% of the total course grading, assuming that it is the most appropriate means to explain all the technical details of the project, and a weight of 20% at the oral presentation. The course assessment is completed with the evaluation of the practical exercises done along the course, that account for another 50% of the total course grading.

The semester project (both the project report and the oral presentation) are done individually. The course exercises and seminars can be done individually or in small teams, as indicated by teachers in each case.

Time assigned to each evaluation activity includes the time spent in making all the material evidences for evaluating each activity (e.g., writing of the report, preparing the presentation slides, etc.).

b) Evaluation schedule:

2nd semester project report: Making during all the semester. Submission at the end of semester, on April 16th, 2021.

<u>2nd semester project oral presentation</u>: Making during all the semester. Oral presentation at the end of semester, on April 9th, 2021.

<u>Course practical exercises and seminars</u>: Making and submission weekly or biweekly along the semester.

c) Grade revision:

Once the grades obtained are published, students will have one week to apply for a grade revision by arranging an appointment with the corresponding teachers.

d) Procedure for reassessment:

<u>2nd semester project report</u>: It could be reassessed in the following two weeks after the submission date scheduled. Reassessment will require the submission of a new whole report in case of negative evaluation of the former report submitted.

<u>2nd semester project oral presentation</u> It could be reassessed in the following week after the date scheduled for the oral presentation. Reassessment will require doing again the oral presentation in case of negative evaluation of the former presentation done.

<u>Course practical exercises and seminars</u>: Can not be reassessed.

To have right to a reassessment the student will have to have been previously evaluated in a set of activities that account for at least two thirds of the total course grading. Therefore he or she will have to have been evaluated of the 1st semester project report (30%) and of the 1st semester project oral presentation (20%) in the dates scheduled.

The right to a reassessment will only be granted to students that, having not passed the course (e.g., having a total course grade below 5 over 10), had obtained at least a total course grade above 3,5 over 10.

e) Conditions for a 'Not assessable' grade:

Students will receive the grade 'Not assessable' instead of 'Fail' if they had not submitted neither the 2nd semester project report nor done the 2nd semester project oral presentation. That is, if they only submit all or part of the course practical exercises.

f) UAB regulations on plagiarism and other irregularities in the assessment process:

In the event of a student committing any irregularity that may lead to a significant variation in the grade awarded to an assessment activity, the student will be given a zero for this activity, regardless of any disciplinary process that may take place. In the event of several irregularities in assessment activities of the same subject, the student will be given a zero as the final grade for this subject.

Assessment acitivities with a zero grade because of irregularities can not be reassessed.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Oral presentations	20	6	0.24	9, 7, 8, 5, 6, 1, 11
Practical exercises	50	15	0.6	3, 4, 5, 10, 1, 2, 12
Report submissions	30	9	0.36	8, 6, 1, 2, 11

Bibliography

Basic references

Nicholas, John M. *Project Management for Business and Technology*. Prentice-Hall, 2001.

McConnell, Steve. *Desarrollo y gestión de proyectos informáticos*. Mc. Graw-Hill Interamericana, 2000.

Davidson, Jeff. *La Gestión de Proyectos*. Prentice-Hall (guías de bolsillo), 2000.

Clanchy, John; Ballard, Brigid. *Cómo se hace un trabajo académico. Guía práctica para estudiantes universitarios*. Zaragoza: Prensas Universitarias de Zaragoza, Ciencias Sociales 23, 2000 (Essay Writing for Students: A practical Guide, 1997)

Morales, Carlos Javier. *Guía para hablar en público*. Madrid: Alianza Editorial, LP 7010, 2001.

Suggested readings

Goldratt, E.M., *La meta un proceso de mejora continua* (3ª ED.), Editorial Díaz de Santos, S.A., 2005.

Goldratt, E.M., *Cadena critica: Una novela empresarial sobre la gestion de proyectos* (1ª ED.) Editorial Díaz de Santos, S.A., 2001.