



Universidad
de Alcalá

TEACHING GUIDE

Project management

Degree in
Information System Engineering (GISI)
Computer Engineering (GIC)
Computer Science Engineering (GII)

Universidad de Alcalá

Academic Year 2022/2023

3rd Year - 2nd Semester (GISI+GIC+GII)

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Course Name:	Project management
Code:	780022 (GISI+GIC+GII)
Degree in:	Information System Engineering (GISI) Computer Engineering (GIC) Computer Science Engineering (GII)
Department and area:	Ciencias de la computación Computer Languages and Systems
Type:	Compulsory (GISI+GIC+GII)
ECTS Credits:	6.0
Year and semester:	3rd Year - 2nd Semester (GISI+GIC+GII)
Teachers:	Por definir
Tutoring schedule:	Consultar al comienzo de la asignatura
Language:	English

1. COURSE SUMMARY

Project Management course is aimed at training students in the foundation principles of planning, management and control of projects in all the phases: estimation, planning and operation. The course explores topics, which are common to any type of project like resource management and time planning methods and others which are more connected to projects in informatics like resource estimation in software projects.

The course promotes the understanding of basic concepts while seeking qualification in problem solving combining systematic methodologies with the creation and discussion of alternatives, to facilitate decision making.

The main topics addressed in this course are the following ones: planning and project control, management and monitoring of projects, economic and financial analysis of projects and computer support to project planning.

Prerequisites and recommendations

For optimal results in the course, students need good knowledge and skills of Statistics, Calculus, Computer Science and Business Administration which are taught in the first and second academic years of the degree.

Due to the integration of the concepts of IT projects planning and management with software engineering methodologies and different types of software life cycles, it is recommendable a background on Software Engineering.

2. SKILLS

Basic, Generic and Cross Curricular Skills.

This course contributes to acquire the following basic, generic and cross curricular skills:

en_CG1 - Ability to conceive, write, organize, plan, develop and sign projects in the field of computer engineering that are intended, in accordance with the knowledge acquired as established in section 5, annex 2, of resolution BOE-A -2009-12977, the conception, development or exploitation of computer systems, services and applications.

en_CG2 - Ability to direct the activities object of the projects in the field of information technology in accordance with the knowledge acquired in accordance with the provisions of section 5, annex 2, of resolution BOE-A-2009-12977.

en_CG9 - Ability to solve problems with initiative, decision making, autonomy and creativity. Ability to know how to communicate and transmit the knowledge, skills and abilities of the profession of Computer Engineering Engineer.

en_CG10 - Knowledge to perform measurements, calculations, assessments, appraisals, appraisals, studies, reports, task planning and other similar computer work, in accordance with the knowledge acquired as set out in section 5, annex 2, of BOE resolution -A-2009-12977.

en_CG11 - Ability to analyze and assess the social and environmental impact of technical solutions, including the ethical and professional responsibility of the activity of the Technical Computer Engineer.

en_CG12 - Knowledge and application of basic elements of economics and human resources management, organization and planning of projects, as well as legislation, regulation and standardization in the field of computer projects, in accordance with the knowledge acquired as established in section 5 , annex 2, of resolution BOE-A-2009-12977.

en_CB1 - That students have demonstrated to possess and understand knowledge in an area of

study that is based on general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study.

en_CB2 - That the students know how to apply their knowledge to their work or vocation in a professional manner and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

en_CB3 - That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical issues.

en_CB4 - That students can transmit information, ideas, problems and solutions to both a specialized and non-specialized public.

en_CB5 - That the students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

en_TRU1 - Capacity of analysis and synthesis.

en_TRU2 - Oral and written competencies.

en_TRU3 - Ability to manage information.

en_TRU4 - Autonomous learning skills.

en_TRU5 - Team work.

Specific Skills

This course contributes to acquire the following specific skills:

en_CI1 - Ability to design, develop, select and evaluate applications and computer systems, ensuring their reliability, safety and quality, in accordance with ethical principles and current legislation and regulations.

en_CI2 - Ability to plan, conceive, deploy and direct projects, services and computer systems in all areas, leading its implementation and continuous improvement and assessing its economic and social impact.

en_CI3 - Ability to understand the importance of negotiation, effective work habits, leadership and communication skills in all software development environments.

en_CI4 - Ability to prepare the technical specifications of a computer installation that meets current standards and regulations.

en_CI16 - Knowledge and application of the principles, methodologies and life cycles of software engineering.

en_CI18 - Knowledge of the regulation and regulation of information technology in the national, European and international spheres.

Learning Outcomes

After succeeding in this subject the students will be able to:

RA1 To identify and understand the basic concepts of project management and know about the main methodologies for project management

RA2 To identify and understand the basic concepts of project feasibility.

RA3 To analyze the feasibility of a project under different criteria and evaluate the practical consequences based on the calculated values

RA4 To identify and understand the basic concepts of planning and effort and cost estimation of

projects.

RA5 To carry out effort and cost estimation of projects by calculating its size and evaluating other indicators through standardized measures and estimation models and methods (both manually and with the help of tools).

RA6 To identify and understand the basic concepts of time planning and phases, resources and a project's calendar.

RA7 To carry out the time, resource and calendar planning of a project, adjusting to its restrictions and specifications, using representation diagrams and planning methods (both manually and with the help of tools).

RA8 To identify and understand the basic concepts of project monitoring and control.

RA9 To carry out the project monitoring from its available control data, calculating indicators and evaluating the consequences and making decisions (both manually and with the help of tools).

RA10 To identify and understand the basic concepts of risk management, security and configuration management and quality.

3. CONTENTS

Contents Blocks*	Total number of hours
Block 1 Project Management Foundation • Unit 1.1 Concept of Project • Unit 1.2 Project Feasibility • Unit 1.3 Project Management and Organization • Unit 1.4 Project Management Methodologies	12 hours
Block 2 Planning and Effort Estimation • Unit 2.1 Size Estimation and other factors • Unit 2.2 Effort Estimation • Unit 2.3 Cost Estimation	20 hours
Block 3: Time planning • Unit 3.1 Resources and calendar • Unit 3.2 Time planning methods	20 hours
Block 4 Project execution • Unit 4.1 Project tracking and control • Unit 4.2 Risk Management • Unit 4.3 Configuration and Quality Management	8 hours

(*) Continuous Assessment Tests (PEI) included

The actual order does not necessarily need to follow the order indicated in the previous table. It will be adapted to the student's learning of each one of the parts in which the subject

4. TEACHING - LEARNING METHODOLOGIES. FORMATIVE ACTIVITIES.

4.1. Credits Distribution

Number of on-site hours:	58 hours (56 hours on-site +2 exams hours)
Number of hours of student work:	92
Total hours	150

4.2. Methodological strategies, teaching materials and resources

Lectures and expository classes, in combination with laboratory assignments	<ul style="list-style-type: none"> • Presentation and discussion of basic knowledge of the subject. • Presentation and resolution of related exercises and assumptions. • Activities oriented to the teaching of the specific competences of the subject, especially those related to the knowledge and use of quality assurance techniques.
Group and cooperative work	<ul style="list-style-type: none"> • Approach and development of practical exercises for solving problems and analyzing hypotheses and contribute to the development of the ability to analyze results, teamwork, leadership, communication skills, critical reasoning and understanding of the resolution methods proposed. • Elaboration of work with individual and collective responsibility but with information management and team activities. • Sharing of information, problems and doubts that appear in the realization of the work. • Organization and realization of public conferences with oral presentations and discussion of results.
Personal study and work	<ul style="list-style-type: none"> • Analysis and assimilation of the contents of the subject, problem solving, bibliographic consultation, preparation of individual and group work, use of the Virtual Classroom platform with self-evaluations. • Tutorials/personal sessions: individual and group counseling during the teaching-learning process, either in person or remotely.

5. ASSESSMENT: procedures, evaluation and grading criteria

Preferably, students will be offered a continuous assessment model that has characteristics of formative assessment in a way that serves as feedback in the teaching-learning process.

5.1. PROCEDURES

The evaluation must be inspired by the criteria of continuous evaluation (Learning Assessment Guidelines, LAG, art 3). However, in compliance with the regulations of the University of Alcalá, an alternative process of final evaluation is made available to the student in accordance with the [Learning Assessment Guidelines](#) as indicated in Article 10, students will have a period of fifteen days from the start of the course to request in writing to the Director of the Polytechnic School their intention to take the non-continuous evaluation model adducing the reasons that they deem convenient. The evaluation of the learning process of all students who do not apply for it or are denied it will be done, by default, according to the continuous assessment model. The student has two calls to pass the subject, one ordinary and one extraordinary.

Ordinary Call

The evaluation system of the course will be in accordance with RD 1125/2003, which regulates the ECTS credit system. Students will be subject to the evaluation procedures as articulated in Title 2 (art. 9 and 10) of the Learning Assessment Regulations of the UAH approved in its Governing Council of March 24, 2011. Preferably, students will be offered a continuous evaluation system that has formative evaluation characteristics, so that it serves as feedback in the teaching-learning process by the student.

Continuous Assessment:

The students will have to attend the laboratory sessions and make the corresponding deliveries to all the laboratory assignments. They will deliver in group the results of the laboratory assignments following the established schedule.

The evaluation will be based on the PEI tests, the group practices TA and the complementary activities ACP.

Assessment through final exam:

For students who have waived the continuous assessment, the ACP grading instrument will be limited to the activities that can be done remotely through the virtual classroom. The delivery of the practical work TA1 and TA2 will be done on the date and format determined before the official exam day designated in the teaching planning of the degree (in which an exam with all the PEIs that are also performed in continuous assessment are performed).

Extraordinary Call

Students who have demonstrated sufficient ability in any of the Key Learning Outcomes in the ordinary call in the joint tests of the different blocks will not have to repeat these tests, keeping their respective grades (PE1-PE2-ACP1, TA1, PE3-PE4-ACP2 and TA2). However, the student who has not passed any of the Key RA in any of the evaluation tests will have to retake the corresponding block.

5.2. EVALUATION

EVALUATION CRITERIA

The assessment criteria measure the level in which the competences have been acquired by the student. For that purpose, the following are defined::

CE1 The student is able of identifying and understanding the basic concepts of project management and to know the main methodologies through questions and resolution of case studies related to

specific situations in projects.

CE2 The student is able of identifying and understanding the basic concepts of the feasibility analysis of projects through questions and resolution of case studies related to specific situations in projects.

CE3 The student is able of analyzing the feasibility of a project under different criteria and evaluate the practical consequences from the calculated values (both manually and with the help of tools) for decision making.

CE4 The student is able of identifying and understanding the basic concepts of planning and estimating effort and costs of a through questions and resolution of case studies related to specific situations in projects.

CE5 The student is able of estimating the efforts and costs of a project by calculating its size and evaluating other indicators through standardized measures and using estimation models and methods (calculated manually and with the help of tools).

CE6 The student is able of identifying and understanding the basic concepts of time planning and project phases, resources and deadlines of a project through questions and resolution of case studies related to specific situations in projects.

CE7 The student is able of developing the temporal, resource and calendar planning of a project, adjusting to its restrictions and specifications, using representation diagrams and planning methods (both manually and with tools).

CE8 The student is able of identifying and understanding the basic concepts of project monitoring and control through questions and resolution of case studies related to specific situations in projects.

CE9 The student is able of tracking a project from its control data, calculating indicators and evaluating the consequences as well as making the appropriate decisions (both manually and with tools).

CE10 The student able of identifying and understanding the basic concepts of project risk and security management as well as project configuration management and software quality through questions and resolution of case studies related to specific situations in projects.

GRADING TOOLS

The work of the student is graded in terms of the assessment criteria above, through the following tools:

1. Intermediate Assessment Test (PEI1): about theoretical questions of blocks 1 and 2.
2. Intermediate Assessment Test (PEI2): solving practical problems of blocks 1 and 2.
3. Intermediate Assessment Test (PEI3): about theoretical questions of blocks 3 and 4.
4. Intermediate Assessment Test (PEI4): solving practical problems of blocks 3 and 4.
5. Practical Work (TA1): carried out as laboratory sessions focused on blocks 1 and 2.
6. Practical Work (TA2): carried out as laboratory sessions focused on blocks 3 and 4.
7. Complementary and Participatory Activities (CPA1 and CPA2): consisting of the individual resolution of theoretical-practical problems related to key competencies and other virtual or face-to-face activities

GRADING CRITERIA

In the ordinary call-continuous assessment the relationship between the competences, learning outcomes, criteria and evaluation instruments is as follows.

Skill	Learning Outcomes	Evaluation criteria	Grading Tool	Contribution to the final mark
CG1, CG2, CG10, CB1-CB5, TRU1-TRU5, CI1-CI4	RA1, RA2, RA3, RA4, RA5	CE1, CE2, CE3, CE4, CE5	PEI1	10%
CG1, CG2, CG10, CB1-CB5, TRU1-TRU5, CI1-CI4	RA1, RA2, RA3, RA4, RA5	CE1, CE2, CE3, CE4, CE5	PEI2	15%
CG9, CG11, CG12, CB1-CB5, TRU1-TRU5, CI16, CI18	RA6, RA7, RA8, RA9	CE6, CE7, CE8, CE9, CE10	PEI3	10%
CG9, CG11, CG12, CB1-CB5, TRU1-TRU5, CI16, CI18	RA6, RA7, RA8, RA9	CE6, CE7, CE8, CE9, CE10	PEI4	15%
CG1, CG2, CG9-CG12, CB1-CB5, TRU1-TRU5, CI1-CI4, CI16, CI18	RA3, RA5	CE1, CE2	TA1	15%
CG1, CG2, CG9-CG12, CB1-CB5, TRU1-TRU5, CI1-CI4, CI16, CI18	RA7, RA9, RA10	CE3, CE4	TA2	15%
CG1, CG2, CG9-CG12, CB1-CB5, TRU1-TRU5, CI1-CI4, CI16, CI18	RA1, RA2, RA3, RA4, RA5	CE1, CE2	ACP1	10%
CG1, CG2, CG9-CG12, CB1-CB5, TRU1-TRU5, CI1-CI4, CI16, CI18	RA6, RA7, RA8, RA9, RA10	CE3, CE4	ACP2	10%

In the ordinary call-final evaluation, the relationship between the competences, learning outcomes, criteria and evaluation instruments is as follows.

Skill	Learning Outcomes	Evaluation criteria	Grading Tool	Contribution to the final mark
CG1, CG2, CG10, CB1-CB5, TRU1-TRU5, CI1-CI4	RA1, RA2, RA3, RA4, RA5	CE1, CE2, CE3, CE4, CE5	PEI1	15%
CG1, CG2, CG10, CB1-CB5, TRU1-TRU5, CI1-CI4	RA1, RA2, RA3, RA4, RA5	CE1, CE2, CE3, CE4, CE5	PEI2	20%
CG9, CG11, CG12, CB1-CB5, TRU1-TRU5, CI16, CI18	RA6, RA7, RA8, RA9	CE6, CE7, CE8, CE9, CE10	PEI3	15%
CG9, CG11, CG12, CB1-CB5, TRU1-TRU5, CI16, CI18	RA6, RA7, RA8, RA9	CE6, CE7, CE8, CE9, CE10	PEI4	20%
CG1, CG2, CG9-CG12, CB1-CB5, TRU1-TRU5, CI1-CI4, CI16, CI18	RA3, RA5	CE1, CE2	TA1	15%
CG1, CG2, CG9-CG12, CB1-CB5, TRU1-TRU5, CI1-CI4, CI16, CI18	RA7, RA9, RA10	CE3, CE4	TA2	15%

Extraordinary call

ACP grades will be applied along with the IEPs to students who followed the continuous assessment.

Skill	Learning Outcomes	Evaluation criteria	Grading Tool	Contribution to the final mark
CG1, CG2, CG10, CB1-CB5, TRU1-TRU5, CI1-CI4	RA1, RA2, RA3, RA4, RA5	CE1, CE2, CE3, CE4, CE5	PEI1+ACP1	15%
CG1, CG2, CG10, CB1-CB5, TRU1-TRU5, CI1-CI4	RA1, RA2, RA3, RA4, RA5	CE1, CE2, CE3, CE4, CE5	PEI2+ACP1	20%
CG9, CG11, CG12, CB1-CB5, TRU1-TRU5, CI16, CI18	RA6, RA7, RA8, RA9	CE6, CE7, CE8, CE9, CE10	PEI3+ACP2	15%
CG9, CG11, CG12, CB1-CB5, TRU1-TRU5, CI16, CI18	RA6, RA7, RA8, RA9	CE6, CE7, CE8, CE9, CE10	PEI4+ACP2	20%
CG1, CG2, CG9-CG12, CB1-CB5, TRU1-TRU5, CI1-CI4, CI16, CI18	RA3, RA5	CE1, CE2	TA1	15%
CG1, CG2, CG9-CG12, CB1-CB5, TRU1-TRU5, CI1-CI4, CI16, CI18	RA7, RA9, RA10	CE3, CE4	TA2	15%

6. BIBLIOGRAPHY

6.1. Basic Bibliography

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- GUTIERREZ DE MESA, J.A. y PAGES, C. Planificación y gestión de proyectos informáticos. Servicio de publicaciones UAH, 2008.
- PIATTINI, M., CALVO-MANZANO, J.A., CERVERA, J. y FERNÁNDEZ, L., Análisis y diseño de aplicación informáticas de gestión. RA-MA, 2003.
- DÍAZ D. LUIS, CASTILLO S. JOSÉ LUIS, NAVARRO H. MIGUEL, "Gestión de la Cartera de Proyectos de TIC", Servicio de Publicaciones Universidad de Alcalá, ISBN: 978-84-16133-56-7, Depósito Legal: M-8342-2015.

6.2. Additional Bibliography

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- Project Management Institute, A Guide to the Project Management Body of Knowledge. PMI 2000.
- Portal de Administración Electrónica del Gobierno de España: documentos que componen la metodología MÉTRICA VERSIÓN 3: http://administracionelectronica.gob.es/?_nfpb=true&_pageLabel=P800292251293651550991&langPae=es&detalleLista=PAE_000000432
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- Center for Systems and Software Engineering, COCOMO®

II http://csse.usc.edu/csse/research/COCOMOII/cocomo_main.html

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- Romero López, C., Técnicas de Programación y Control de Proyectos. Ed. Pirámide. 6ª Edición 2002
- Burke, R., Project Management: Planning and Control Techniques. Ed. Wiley, 1999.
- Connell, S., Desarrollo y Gestión de Proyectos Informáticos. Ed. McGraw-Hill Iberoamericana, 1997.

Disclosure Note

The University of Alcalá guarantees to its students that, if due to health requirements the competent authorities do not allow the total or partial attendance of the teaching activities, the teaching plans will achieve their objectives through a teaching-learning and evaluation methodology in online format, which will return to the face-to-face mode as soon as these impediments cease.