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 2026/2027

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

Approved by the EPS School Board on June 15th, 2026

TEACHING GUIDE

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**	16 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 teaching 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 of the parts.

4. TEACHING - LEARNING METHODOLOGIES. FORMATIVE ACTIVITIES.

4.1. Credits Distribution

Number of on-site hours:	60 hours (56 hours on-site +4 exams hours)
Number of hours of student work:	90
Total hours	150

4.2. Methodological strategies, teaching materials and resources

Lectures and expository classes, in combination with laboratory assignments	• 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	• Approach and development of practical exercises forsolving 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	• 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 Assesment 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 Assesment 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

Continous 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 assignments 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 there is an exam with all the PEIs).

Extraordinary Call

Students who have demonstrated sufficient capacity in any of the Key Learning Outcomes (RA) in the ordinary call in the combined 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 controls 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 (it could include several parts with separated submission).
6. Practical Work (TA2): carried out as laboratory sessions focused on blocks 3 and 4 (it could include several parts with separated submission).
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 and attendance.

TA1 and TA2 will be carried out in student teams throughout the established time periods, combining independent work with tutoring in laboratory sessions and may include public presentations of results and/or individual tests according to the plan, so each student's grade may vary depending on their performance in these assessments.

GRADING CRITERIA

This section sets out the assessment criteria for passing the course. The assessment criteria to be applied in the course are linked to the competences defined for it through the learning outcomes, including generic competencies, and will be designed to assess both the level of understanding of the basic content and ideas, and the

ability to apply concepts to problem-solving, both with and without the aid of software tools. In addition, consideration will be given to the student's collaborative attitude and proactivity in carrying out both individual and group tasks, and the degree of interest shown in undertaking and completing class activities and independent work; therefore, the timely submission of all practical activities in the required format will be essential. The assessment results obtained will be based on the following rubrics:

• Outstanding: demonstrates, through assessment tests, mastery of all learning outcomes across all competencies.

• Good: demonstrates sufficient ability in all learning outcomes across all competencies, with mastery of

some competencies or some of their learning outcomes.

• Pass: demonstrates sufficient ability in all competencies or, at least, in the key learning outcomes whilst demonstrating proficiency in other skills or in some learning outcomes of other skills.

• Partial failure: demonstrates insufficient ability in a minimum number of learning outcomes and/or performs them incorrectly in some of them or in a key outcome, although they have demonstrated sufficient ability in a set of key learning outcomes.

• Inadequate: makes serious errors and/or makes such errors in the majority of learning outcomes or competencies; or fails to meet the minimum standard for key learning outcomes; or does not demonstrate any relevant learning outcomes.

As a general criterion, to pass the module, students must demonstrate mastery of the module's theoretical competencies and their respective key learning outcomes (RA), as assessed in the various PEI tests. Furthermore, students who do not sit any of the PEI during the regular assessment period will be considered as Not Attended (NP).

In accordance with current regulations on the assessment of learning, it is established that students who do not meet the minimum percentage of class attendance (lecture hall and/or laboratory) communicated by each lecturer at the start of the course will not be able to pass the continuous assessment, regardless of their results in the assessment tests.

The learning outcomes considered key are as follows: RA3, RA5, RA7 and RA9. Learning outcomes will be assessed using a scale with the following pass grades: full mastery (A), partial mastery (B), sufficient competence (C), partial insufficiency (D) or complete insufficiency (E). Competencies will be assessed by aggregating the evaluations of their learning outcomes. Grades obtained through different assessment methods for the same learning outcomes may be offset using the following criteria: an A grade balances an E grade, and a B grade balances a D grade.

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%

The teaching-learning methodology and the evaluation process will be adjusted when necessary, with the guidance of the Diversity Support Unit, to apply curricular adaptations for students with specific needs.

6. BIBLIOGRAPHY

6.1. Basic Bibliography

- Topic presentations, notes and materials available on the virtual classroom
- 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

- Díaz Martín, A. El arte de dirigir proyectos. Samper, 1995.
- 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=P80029225129365155099 1&langPae=es&detalleLista=PAE_000000432
- Dolado, J. J. y Fernández, L. (coordinadores). Medición para la Gestión en la Ingeniería del Software. Ra-Ma. España 2000. Cap. 11.
- Garmus, D. and Herrón, D: "Function Point Analysis: Measurement Practices for Successful

Software Projects"; Ed. Addison-Wesley; Diciembre de 2000.
- Center for Systems and Software Engineering, COCOMO® II http://csse.usc.edu/csse/research/COCOMOII/cocomo_main.html
- University of South Carolina, Arnold School of Public Health, Dept. of Health Services Policy and Management Courses and Curricula, Critical Path Method (CPM): http://hadm.sph.sc.edu/Courses/J716/CPM/CPM.html
- Piattini, M.G. et al, Análisis y Diseño Detallado de Aplicaciones Informáticas de Gestión. Cap. 4. Ed Ra-Ma. 2007
- 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

During the evaluation tests, the guidelines set out in the Regulations establishing the Rules of Coexistence of the University of Alcalá must be followed, as well as the possible implications of the irregularities committed during said tests, including the consequences for committing academic fraud according to the Regulation of Disciplinary Regime of the Students of the University of Alcalá.