Universidad de Alcalá

TEACHING GUIDE

Degree Final Project

Degree in
Computer Science Engineering

Universidad de Alcalá

Academic Year 2023/2024

4th Year - 1st and 2nd Semester

Approved by the School Board on June 12th, 2023

TEACHING GUIDE

Course Name:	**Degree Final Project**
Code:	**781008**
Degree in:	**Computer Science Engineering**
Department and area:	**Todos los implicados en la titulación** **Anyone participating in the degree**
Type:	**Compulsory**
ECTS Credits:	**12.0**
Year and semester:	**4th Year, 1st and 2nd Semester**
Teachers:	Any teacher belonging to the departments participating on the degree.
Tutoring schedule:	To be determined with the teacher
Language:	English

1. COURSE SUMMARY

The curriculum of the degrees in Computer Science Engineering (BOE no. 58, march 2011), Computer Engineering (BOE no. 71, march 2010) and Information Systems (BOE no. 71, march 2010) of the University of Alcalá establishes the course “Degree Final Project” as a compulsory course in the fourth year with a total of 12 ECTS credits.
The degree project is an original, autonomous and individual work of the student. It must consist in a project in the field of the specific technologies of the Computer Engineering, of a professional nature, and in which the student applies and develops the competences acquired during the career, constituting a final proof of maturity before moving on to the professional field, and providing its realization an opportunity for the development of his/her creativity. The term “original” means that by no means the work can be plagiarized and should not have been previously presented by any other student, not being necessary to be an unpublished work.
It will be done under the guidance of a tutor. Each student must submit a report describing precisely what this work consisted of, and defend the work done before a court. The report may be presented in Spanish or English.
In addition to what is established in the Verifica report published by the University of Alcalá for these grades (http://www.uah.es/escuela-politecnica/escuela/garantia- calidad.asp?capa=memoria), the development of the Degree Final Project will be also governed by the regulations of the University of Alcalá, approved by the governing council on March 24, 2011 and modified by the same Council on March 21, 2013, and also by the specific regulations of the Higher Polytechnic School.
For the completion of the Degree Final Project, it is recommended that the student has passed all the basic subjects, those common to the telecommunication branch and those of specific technology directly related to the objectives of the project to be developed.

2. SKILLS

Basic, Generic and Cross Curricular Skills.

This course contributes to acquire the following generic skills, which are defined in the Section 3 of the Annex to the Orden CIN/352/2009:

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_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.

Professional Skills

This course contributes to acquire the following professional skills, which are defined in the Section 5 of the Annex to the Orden CIN/352/2009:

en_CTFG1 - Original exercise to be carried out individually and presented and defended before a university tribunal, consisting of a project in the field of specific technologies of Computer Engineering of a professional nature in which the competences acquired in the teaching are synthesized and integrated.

Learning Outcomes

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

RATFG1. Adequately interpret the characteristics of a project in the corresponding field (computers, information technology or systems), understand them and design an approach to the problem with creativity and own initiative.

RATFG2. Develop related projects in the corresponding field with the appropriate quality standards.

RATFG3. Transmit the information and results of an engineering project orally and in writing.

RATFG4. Define all regulatory aspects of projects in the specific field.

RATFG5. Integration of the competences acquired in the teachings in the development of a project in the corresponding field.

RATFG6. Search and manage the necessary information to respond to the challenges posed by a project in the corresponding field.

RATFG7. Plan the tasks to be carried out for the development of a project in the corresponding field.

RATFG8. Prepare reports and reports of scientific-technological quality, describing in a clear and structured way, an industrial technical engineering project, the necessary bibliographical references, an evaluation of the results and a proposal for improvements.

RATFG9. Present and defend a project in the corresponding field.

RATFG10. Work autonomously, looking for feasible solutions to the problems encountered.

3. CONTENTS

The content of each project will be initially defined in the preliminary draft approved by the department in which the work is carried out. The final report will reflect the adequate development of that content, which will have to be adjusted to the 12 ECTS credit load corresponding to the Degree Final Project. According to the regulations of the Higher Polytechnic School on the realization of the Degree Final Projects, these should be framed in one of the following types:

1. Design and realization (partial or total) of an application or computer system or original engineering

that constitutes a contribution to engineering techniques.
2. Preparation of a computer or engineering project consisting of a set of sections that allow the manufacture or installation of a system or a series of them
3. Theoretical study of a computer system or engineering, material or computer technology or advanced engineering, of interest for its novelty, recent implementation, etc. and that has a practical application
4. Work developed in official centers or companies, national or foreign, by virtue of agreements or agreements to that effect. For this modality it will be necessary to have an additional tutor (co-tutor), belonging to the institution where the project will take place. Since external practices are a subject in the curriculum, the memory of practices cannot be used as a Degree Final Project, without prejudice to the existence of a thematic relationship, in accordance with the requirements established in this regulation.
5. Research projects proposed by professors belonging to the departments, Research Groups or Business Chairs.
6. Experimental, theoretical or review work and bibliographic research related to the degree, which may be developed in departments, Centers of the University of Alcalá or in the scope of the Research Groups and Business Chairs.
7. Other works, theoretical or practical, that correspond to the offers of the departments or of the students themselves, not adjusted to the previous modalities.

4. TEACHING - LEARNING METHODOLOGIES. FORMATIVE ACTIVITIES.

4.1. Credits Distribution

Number of on-site hours:	Those agreed between the student and the tutor (Scheduled and follow-up tutoring hours)
Number of hours of student work:	300 h, including on-site hours
Total hours	300

4.2. Methodological strategies, teaching materials and resources

The training activities of this subject focus on the personal work of the student, which will include as many tasks as are necessary for the fulfilment of the objectives of the Degree Final Project: documentation, field and laboratory work, writing of the final report, presentation of results.
The student will perform the tasks under the supervision of his tutor. Apart from the support provided by the tutor, the departments may authorize the student to access the laboratories needed to develop the project, provided they have an approved draft and are in the phase of conducting the Degree Final Project.
The means necessary to carry out the Degree Final Project can be financed by:

1. The department to which the tutor is assigned or any other of the university interested in the development of the system.
2. Any company, organization or institution interested in the exercise carried out.
3. The student himself.

The report presented by the student must comply with the rules of format and content, and in general all

those defined in the regulations on TFGs of the Higher Polytechnic School.

5. ASSESSMENT: procedures, evaluation and grading criteria

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.

Both for the ordinary and the extraordinary call, the evaluation instruments that will be used to measure the degree of acquisition of the learning outcomes are those detailed below:

- Project and development of the work: Work developed by the student in the different stages of development of the Degree Final Project described in the Preliminary Project.
- Memory: Scientific-technological quality of the developed memory, as well as making a memory that respects the norms of format and contents that are detailed in the regulations of the Higher Polytechnic School.
- Oral presentation: Presentation and defence of the work carried out and the results obtained.

In the case of not passing the subject in the ordinary call, the student may submit to the extraordinary call, presenting a new memory and, where appropriate, a new application, device or system, or a new version thereof that includes the modifications and improvements recommended by the board in the ordinary call.

5.2. EVALUATION

EVALUATION CRITERIA

The objective of the evaluation process is to assess the degree and depth of the competences acquired by the student.
For the evaluation of the competences and of the learning results described above, the following evaluation criteria will be used:

Related to the project carried out:

CE1. Integrates the skills acquired in the teachings.

CE2. Solves problems with initiative, decision making and creativity.

CE3. Has the capacity to handle mandatory specifications, regulations and standards

CE4. Develops projects related to the corresponding engineering with the appropriate quality standards.

CE5. Defends a project in the field of the corresponding Engineering.

Related to the development of the work:

CE6. Finds the information necessary to carry out the work and analyses it to extract the one that is of interest.

CE7. Synthesizes the information obtained from different sources and the own knowledge in a global and structured vision of the "state of the art" of the project, correctly referencing the information obtained from third parties.

CE8. Demonstrates initiative, ability to make decisions and autonomous learning ability.

CE9. Plans the work, and is able to follow the planning and analyse and justify possible deviations on planning.

Related to the oral exposition:

CE10. Orally exposes the contents of the work with precision and clarity and in the proper order to facilitate understanding.

CE11. Uses the appropriate vocabulary in each circumstance making proper use of the technical lexicon when necessary.

CE12. Shows empathy with the audience by transmitting security in what is said using the appropriate tone and volume

CE13. Makes the work exhibition in the time available for it

Related to the presented report:

CE14. The memory follows the expected structure for an engineering project taking into account the guidelines set by the regulations.

CE15. The memory is written treating the different topics with the necessary depth and adequately referencing the sources of information.

CE16. When the memory describes a system, product, prototype, ... realized, the content of this one coincides with the system, product, prototype, ... developed

CE17. The memory is written clearly, using appropriate vocabulary and with good use of spelling and grammar rules

GRADING CRITERIA:

In accordance with the evaluation criteria described above, the qualification of the Degree Final Project, both in the ordinary and in the extraordinary call, will be carried out in accordance with the attached rubric.
With regard to the rubric, the maximum weights proposed for each block (5 points, 2 points and 3 points) are for guidance purposes. It is the court that, depending on the nature of the work, will establish those weights, as well as decide if the weights and grades are detailed for each evaluation criterion, or globally for each block.

6. BIBLIOGRAPHY

6.1. Basic Bibliography

Specific for each Degree Final Project.

6.2. Regulations

- Specific regulations of the EPS.
- Rubric for the evaluation.
- Information page on the TFG for the EPS.

Tutor's report on the Degree Final Project

Mr./Mrs./Ms. ....., tutor of the final degree project:
"....", made by
Mr./Mrs./Ms. ....., hereby
issues the following report on the aforementioned work.

☐ Favourable

☐ Unfavourable

COMMENTS (**ONLY** must be included if the report is unfavourable):

Alcalá de Henares, ..., ..., 20.....

Signed: ..... .

Degree Final Project defence act

Degree Final Project defence record. Academic year __201____ / __201____

Title:

Author:

DNI/Passport:

Degree:

Tutor:

Cotutor (if applicable):

Department:

The court has decided to grant the qualification of:

Proposed for Honours * (*mark with an* X) ☐ YES ☐ NO

* The Court may propose for a distinction of Honours a Degree Final Project with an outstanding qualification. The student who accepts this proposal, voluntarily resigns to the request of issuance of the Graduate Degree until the end of the academic year, at which time the grant of Honours is resolved

Alcalá de Henares, ..., ... , ...

President	**1st Vocal**	**2nd Vocal**
Signed:	**Signed:**	**Signed:**

RUBRIC FOR THE EVALUATION OF THE DEGREE FINAL PROJECT

Learning outcomes	Evaluation criteria	Weight	Qualif.	Comments of the court
BLOCK 1: Project • Project related to the corresponding field with the appropriate quality standards (RATFG2) • Regulatory aspects of projects in the specific field (RATFG4) • Integration of the acquired competences (RATFG5)	• Integrates the skills (CE1)			
	• Initiative, decision-taking and creativity (CE2)			
	• Handle specifications, regulations and standards (CE3)			
	• Project with the appropriate quality standards (CE4)			
	• Defends a project in the field of the profession (CE5)			
	Maximum weight / Qualification (Suggested maximum weight 5 points)			
BLOCK 2: Development of the work • Interpret, understand and design an approximation to the problem with creativity and initiative. (RATFG1) • Work autonomously (RATFG10) • Search and manage the necessary information to respond to the challenges posed by the project (RATFG6) • Task planning (RATFG7)	• Information search (CE6)			
	• Synthesize the information, global vision and state of the art (CE7)			
	• Initiative, decision-taking capacity and self-learning (CE8)			
	• Planification of the work. Analysis/Justification of deviations (CE9)			
	Maximum weight / Qualification (Suggested maximum weight 2 points)			

BLOCK 3: Report and oral presentation • Transmit information, oral and writing (RATFG3) • Quality of the report, state of the art, results and their interpretation, future lines of work (RATFG8) • Presentation and defence (RATFG9)	The report follows the format regulations (CE14)			
	Report written with enough depth and good references (CE15)			
	Report and work coincide (CE16)			
	Report written clearly (CE17)			
	Good, precise and correct oral presentation (CE10)			
	Adequate use of the vocabulary in the presentation (CE11)			
	Social aptitudes (CE12)			
	Presentation adjusted to the time (CE13)			
	Maximum weight / Qualification (Suggested maximum weight 3 points)			

Note 1: With regard to the rubric, the maximum weights proposed for each block (5 points, 2 points and 3 points) are for guidance purposes. It is the court that, depending on the nature of the work, will establish those weights, as well as decide if the weights and grades are detailed for each evaluation criterion, or globally for each block

Note 2: Block 2 will be evaluated mainly by the tutor.

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.