ACADEMIC PROGRAM

PROJECTS III: WEB AND APP DEVELOPMENT

B.F.A. IN COMPUTER SCIENCE

MODALITY: ON CAMPUS

ACADEMIC YEAR: 2023-2024

Name of the course:	Projects III: Web and app development	
Degree :	Computer Science	
Location:	Centro Universitario de Tecnología y Arte Digital	
Area:	Projects	
Year:	3º	
Teaching period:	Anual	
Type:	OB	
ECTS credits:	9	
Teaching modality:	On campus	
Language:	English	
Lecturer / Email	-	
Web page:	http://www.u-tad.com/	

SUBJECT DESCRIPTION

Area description

 The projects subject is a tool that will enable the student to strengthen and reinforce the skills acquired in the rest of the subjects of the degree, as well as develop teamwork skills and the acquisition of professional work dynamics. It will also allow essential interdisciplinary work for the insertion and development of any digital profession.

Subject description

The subject of Projects III Web App Development aims for the student to acquire basic methodological knowledge and communication and teamwork skills, which will allow them to successfully join any software development work team.

In the subject, therefore, in addition to the technological and methodological components that will be developed in more depth in subsequent subjects, a component of "soft-skills" will have weight, focusing on the development of communication skills, teamwork and dialogue and establishment of objectives and distribution of work.

Teamwork will be encouraged from the beginning of the subject, with colleagues of different profiles.

In the first semester (Q1), and accompanying the theoretical lessons, exercises will be carried out in class and also the development of group work.

The second quarter (Q2) will be dedicated to carrying out a group software development project, using the agile methodology, so that what was learned in the first quarter can be put into practice.

Likewise, there will be a series of theoretical lessons with the aim of continuing to improve presentation and communication skills. Likewise, students will have a series of technical support sessions for the development of the software development project.

COMPETENCIES AND LEARNING OUTCOMES

Competencies

BASIC AND GENERAL COMPETENCIES

CG1 - Ability to understand, schedule and solve problems trough software development

CG2 - To develop software that are environmental friendly, engaged with society and natural resources and law and ethics compliant

CG3 - Knowledge of the scientific fundamentals applicable to the resolution of computer problems

CG4 - Ability to simplify and optimize computer systems by understanding their complexity

CG5 - Management of human and technological resources for the proper delivery of computer projects

CG6 - Develop collaborative projects showing teamwork skills, versatility, flexibility, creativity and respect for the work of the team members

CG7 - Knowledge of the creative foundations of ideation in software development projects.

CG9 - Ability to learn, modify and develop new software solutions

CG10 - Use of creative techniques to carry out computer projects

CG11 - Ability to search, analyze and manage information for insights capture

CG12 - Ability of decision-making during development of a digital project, based on the analysis of its context and in accordance with its target audience and business model

CG13 -Development of the critical spirit in social and communication spheres to properly behave in the knowledge and information society

BC1: Students should demonstrate knowledge in an area of study that builds upon the foundation of general secondary education and goest beyond at a level that, while supported by advanced textbooks, also encompasses certain aspects derived from the cutting edge of their field of study.

BC2: Students should be able to apply their knowledge to their work or vocation in a professional manner, and they should possess the competencies typically demonstrated through the development and defence of arguments as well as problem-solving within their field of study.

BC3: Students must possess the ability to gather and interpret relevant data (usually within their field of study) in order to make judgments that involve reflection on socially, scientifically, or ethically significant issues.

BC4: Students should be capable of conveying information, ideas, problems, and solutions to both specialized and non-specialized audiences.

BC5: Students should have developed the learning skills necessary to pursue further studies with a high degree of autonomy.

TRANVERSALES COMPETENCIES

CT1 - Knowledge of the definition, scope and implementation of the fundamentals of project management methodologies for technology projects

CT2 - Knowledge of the main sectorial players and the life cycle of a digital content development and commercialization project

SPECIFIC COMPETENCIES

CE5 - Ability to design and deploy client-side and server-side web applications with scalable standard technologies

CE10 - Ability to work with a release manager and generate application documentation automatically.

CE19 - Ability to conceive, design through graphic languages and implement a computer application using different development methodologies, from the conception of the product to its final development to the definition of its phases and iterations

CE20 - Ability to test the operation and functionality of a computer application, develop test plans and use test-oriented design and programming techniques

CE21 -Ability to assess the quality of a computer application by applying software quality measurement metrics, procedures, and standards

CE22 - Knowledge of the techniques and implications of maintaining computer applications including those that use reverse engineering principles to understand and modify software of unknown structure

CE26 - Knowledge of human-machine interaction fundamentals and the role that this interaction plays in the development of digital projects.

CE27 - Knowledge of methods and techniques related to the conceptualization, design, analysis and evaluation of usable and accessible interactive products

Learning outcomes
Upon completion of the degree, the graduate will be able to:

- To learn the Arduino microcontroller programming language

- To build electronic prototypes Arduino-controlled

- To develop a digital system built with microcontrollers

- To develop an interactive application using a graphic engine

- To understand the processes of security analysis and apply them in a simple scenario

- To know the value of data and build an iterative data-driven application

To develop a functional full stack application

CONTENTS

Full stack development of a web application, native or hybrid.

SUBJECT SYLLABUS

Topic 1. Methodology

• Context of agile methodologies

• Frameworks and foundations of agile methodologies (Kanban, Lean, Scrum).

Topic 2. UX Design

• The 4 steps of the design process: requirements collection, design alternatives, prototyping, evaluation.

Topic 3. Leadership and cooperation styles. Emotional intelligence.

• Emotional intelligence and leadership.

• Leadership and self-organized teams.

Topic 4. Motivation

• Extrinsic and intrinsic motivation.

• Keys to motivation of self-organized teams.

Topic 5. Assertive communication and feedback

• Basic principles of assertive communication.

• Development of assertive communication techniques

• Feedback

Topic 6. Conflict management

• Conflict management strategies. Thomas-Kilmann model.

Topic 7. Team development and diversity management

• Basic principles of team development related to agile methodologies (Patrick Lencioni, Peter Senge).

• Role management (Alain Cardon)

• Diversity management.

Topic 8. Effective communication and presentations

• Basic principles of effective communication.

• Effective presentations: objective, structure, content and means.

•   The use of language.

• The use of space.

TRAINING ACTIVITIES AND TEACHING METHODOLOGIES

TRAINING ACTIVITIES

LEARNING ACTIVITIES	Total hours	Hours of presence
Theoretical / Expository classes	15,00	15,00
Practical classes	30,00	30,00
Tutorials	6,00	3,00
Independent study and autonomous work of the student	27,86	0,00
Elaboration of work (group or individual)	96,43	0,00
Evaluation Activities	12,86	12,86
Project Follow-Up	36,86	36,86
TOTAL	225	97,72

Teaching methodologies

Expository method or master lesson

Case learning

Learning based on problem solving

Project based learning

Cooperative or collaborative learning

inquiry learning

Flipped classroom methodology

Gamification

Just in time Teaching (JITT) or classroom on time

Expository method or master lesson

Case method

Learning based on problem solving

Project based learning

Cooperative or collaborative learning

inquiry learning

Flipped classroom methodology

Gamification

TEMPORAL DEVELOPMENT

DIDACTIC UNITS / TOPICS TIME PERIOD

Methodology 4 sessions (Q1)

UX design 1 session (Q1)

Leadership and cooperation styles. Emotional intelligence. 1 session (Q1)

Motivation 1 session (Q1)

Assertive communication and feedback 2 sessions (Q1)

Conflict management 1 session (Q1)

Team development and diversity management 2 session (Q1)

Introduction to effective communication 1 session (Q1)

2Q project preparation 2 sessions (Q2)

Effective communication and presentations 4 sessions (Q2)

Sprint progress presentation 4 sessions (Q2)

Sprint retrospective 4 sessions (Q2)

Technical support sessions 14 sessions (Q2)

EVALUATION SYSTEM

ASSESSMENT SYSTEM	MINIMUM SCORE RESPECT TO THE FINAL ASSESSMENT (%)	MAXIMUM SCORE RESPECT TO THE FINAL ASSESSMENT (%)
Assessment of participation in class, exercises or projects of the course	20	40
Assessment of assignments, projects, reports, memos	40	70
Objective test	10	40

GRADING CRITERIA

ASSESSMENT SYSTEM	ORDINARY EVALUATION	EXTRAORDINARY EVALUATION
Assessment of participation in class, exercises or projects of the course	30	30
Assessment of assignments, projects, reports, memos	30	30
Objective test	40	40

General comments on the evaluations/assessments

• To pass the subject in the ordinary call, it is essential that the final grade is at least 5.0 (out of 10). Each activity evaluated must be approved with at least a 5.0 to be able to make the weighted average. Because it is an annual subject, there is no ordinary session or extraordinary session in Q1.

• No grades of any kind will be kept between different academic years, nor between different calls.

• The use of mobile phones in the classroom is not allowed during the continuous evaluation period, unless expressly indicated otherwise by the teacher. Laptops may only be used for activities related to the subject. The teacher may withdraw the right to use the computer from those students who use it for activities that are not related to the subject (checking emails, news or social networks, consulting or preparing activities for other subjects, etc.).

• It is not allowed to consume drinks or food in the classroom. The presence of any type of drink on the tables is also not permitted, even in closed containers.

•   Class assistance is obligatory. Any student who does not reach 80% attendance in each semester will not be able to take the ordinary session.

• The student's active participation in classes will be required, and will be evaluated based on the following criteria:

o Teacher evaluation:

⯈ Contribution in exercises and group work.

⯈ Contribution to learning in class: questions, valuable contributions, contribution to group learning.

o Evaluation of one's own classmates on individual contribution in work groups and class. Peer evaluation will be carried out once a month according to the criteria set by the teachers.

• The student will be required to behave well at all times during classes. Bad behavior that prevents the normal development of the class may lead to expulsion from the classroom for a period of time to be determined by the teacher.

• The objective evaluation test of the subject will consist of the preparation of a web development project (assigned by the subject teachers) and a public presentation in which the students will defend the result of their work. The evaluation will be done according to a rubric that the teachers will deliver at the beginning of the course.

• If the ordinary call is suspended at the end of the course, the student will have the right to take the extraordinary call. The extraordinary call will consist of:

o An exam of 20 multiple-choice questions on the theoretical contents of the subject. The correct question will have a value of 0.5 points; the wrong question, a value of -0.5 points. The blank question will not count. This exam will count for 50% of the grade.

o A presentation on a project that the students have developed (for any subject of this course or previous ones) where they demonstrate the theoretical knowledge taught in the course. The presentation will count 50% of the grade.

LIST OF REFERENCES (BOOKS, PUBLICATIONS, WEBSITES):

Basic Bibliography:

• Robin Nixon. Learning PHP, MySQL JavaScript with jQuery, CSS HTML5. 4th edition. O'Reilly 2015.

Recommended Bibliography:

• Nicholas S. Williams. Java for Web Applications. Wrox Professional 2014.

• Aravind Shenoy, Ulrich Sossou. Learning Bootstrap. Packt 2014.

• Casimir Saternos. Client-Server Web Apps with JavaScript and Java. O'Reilly 2014.

• Sujoy Acharya. Mastering Unit Testing Using Mockito and JUnit. Packt 2014.

• Satya Avasarala. Selenium WebDriver. Practical Guide. Packt 2014.

• Brad Dayley. Node.js, MongoDB and AngularJS Web Development. Addison-Wesley 2014.

REQUIRED MATERIALS, SOFTWARE AND TOOLS

Type of classroom
Theory classroom

Board and projection system

Materials:
Personal Computer

Software:
Navegador Google Chrome

IDE para desarrollo web

Python 3.7 para el despliegue de nuestro backend.