# ACADEMIC PROGRAM

## CREATIVE THINKING

## B.F.A. IN **COMPUTER SCIENCE**

***MODALITY: ON CAMPUS***

***ACADEMIC YEAR: 2022-2023***

| Name of the course: | Creative Thinking |
|---|---|
| Degree : | Computer Science |
| Location: | Centro Universitario de Tecnología y Arte Digital |
| Area: | Multidisciplinary Fundamentals |
| Year: | 1º |
| Teaching period: | 1 |
| Type: | OB |
| ECTS credits: | 3 |
| Teaching modality: | On campus |
| Language: | English |
| Lecturer / Email | Ángela Sánchez de Vera / angela.torres@u-tad.com |
| Web page: | http://www.u-tad.com/ |

## SUBJECT DESCRIPTION

### Area description

This area refers to the study and practice of the set of communication techniques and skills. In the subjects that belong to this area, content related to philosophical foundations, knowledge of the environment, the philosophy of innovation, business ethics, design and social responsibility, sociology of communication, etc. will be covered in relation to the humanist and generalist orientation of the degree. In addition, the relationship of this knowledge with artistic development will be addressed.

### Subject description

This subject offers techniques to manage project development, focusing on its ideation phase. It provides qualitative generic skills, both training and professional. During the development of the course, lateral thinking techniques and other creative thinking methodologies are used to provide students with strategies to develop ideas, processes, projects and products, with coherence, critical sense and originality.

Thinking is an activity of the mind and creativity is the ability to generate new ideas or concepts, or new associations between ideas to solve problems or generate different solutions. Creativity is synonymous with "original thinking", "constructive imagination", "divergent thinking" or "creative thinking". Creativity is a typical skill of human cognition absent, for example, in algorithmic computing. Therefore, this subject of

Creative Thinking is directly related to all the subjects of the degree and to the daily life of the students, since creative thinking is required every day in each and every one of our actions.

## COMPETENCIES AND LEARNING OUTCOMES

### Competencies

BASIC AND GENERAL SKILLS

GC10 Be able to work in an international context, as well as in diverse and multicultural environments.

GC11 Manage basic skills for interpersonal relations.

GC12 Express a critical and self-critical sense and the ability to analyze in order to evaluate different alternatives.

GC13 Valuing an ethical sense at work.

GC14 Knowing how to work in a team in multidisciplinary environments.

GC15 Being able to organize and plan.

GC16 - Be able to express oneself correctly in oral and written form.

GC18 - Managing information appropriately.

GC19 - Knowing how to make decisions and solve problems in the professional field.

CB1 That students have demonstrated knowledge and understanding in an area of study that starts from the basis of general secondary education, and is usually at a level that, although it is supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study.

CB2 Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defense of arguments and problem solving within their field of study.

CB3 That students have the ability to gather and interpret relevant data (usually within their area of study) in order to make judgements that include reflection on relevant social, scientific or ethical issues.

CB4 Students are able to convey information, ideas, problems and solutions to both specialist and non-specialist audiences.

CB5 That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

TRASVERSAL SKILLS

CT1 Deploy their knowledge, activities and values in cultural, sporting and social environments.

CT2 Show interest in acts of cooperation and civic solidarity.

SPECIFIC SKILLS

SC16 Understand the processes of the elements involved in an interactive artistic production

SC22 Understanding and communicating clearly and effectively the guidelines for the development of a project.

SC26 Understanding and knowing how to thematize the relationships between Technology - Society - Culture, in relation to the design of interactive products.

SC27 Recognizing the philosophical, social and political implications of technological designs and innovations.

SC28 Detecting the implications on ethical and legal limits of technological innovations.

**Learning outcomes**

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

- Use creative thinking techniques in the professional environment

- Propose ideas that can be transformed into designs and developments

- Analyze critically proposals related to software development

- Understand the historical environment of the current digital industry and the changes produced in society due to the inclusion of new digital media.

- To know the variety of company incorporation articles under the Spanish Law.

- To design the structure of the company with the aim of maximizing the contribution of the team.

- Relate intellectual property legislation to different scenarios (national, European and international).

- Identify the sources of relevant economic information and their content.

- Know different marketing techniques and their implications on the development of a digital entertainment product.

- Reflect on the ethical and legal limits of technological innovations.

- To interpret relevant economic, political and cultural data in the design of software design.

- To understand project management paradigms: waterfall and Agile

- To be able to sketch a project schedule and follow it using Gantt and PERT charts

- To know the principles of end user psychology

- To be able to design wireframes

- To develop a user-driven application

- To understand the function of color and shape in the development of interactive applications.

## CONTENTS

Development of creative thinking

Brainstorming

Impromptu and creativity techniques

## SUBJECT SYLLABUS

Topic 1. INTRODUCTION TO CREATIVE THINKING.

1.1 Brief history of creativity. Art and industry, art and technology.

1.2 The creative process. Phases.

Topic 2. IDEA TECHNIQUES, PROBLEM RESOLUTION AND EVALUATION

2.1. Planning a project. Bases for research. Work plan/schedule. Documentation dossier.

2.2. Ideation techniques. Lateral thinking. Definition of the focus. Random words. Brainstorming. Conceptual/mental maps.

2.3 Evaluation techniques. Evaluation of ideas. Critical sessions (Six thinking hats).

Topic 3. APPLIED CREATIVITY

3.1 Creativity, ideation and project. Implementation of the idea.

3.2 Creative process of the idea.

3.3 Portfolio.

## TRAINING ACTIVITIES AND TEACHING METHODOLOGIES

### TRAINING ACTIVITIES

| LEARNING ACTIVITIES | Total hours | Hours of presence |
|---|---|---|
| *Theoretical / Expository classes* | 15,43 | 15,43 |
| *Practical classes* | 10,57 | 10,57 |
| *Tutorials* | 2,00 | 2,00 |

| | | |
|---|---|---|
| *Independent study and autonomous work of the student* | 20,57 | 0,00 |
| *Elaboration of work (group or individual)* | 21,43 | 0,00 |
| *Evaluation Activities* | 5,00 | 5,00 |
| *TOTAL* | 75 | 33 |

### Teaching methodologies

Expository method or master lesson

Case learning

Learning based on problem solving

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

Cooperative or collaborative learning

inquiry learning

Flipped classroom methodology

Gamification

## TEMPORAL DEVELOPMENT

DIDACTIC UNITS / TOPICS TIME PERIOD

Topic 1. Introduction to Creative Thinking 5 weeks

Topic 2. Ideation, problem solving and evaluation techniques 5 weeks

Topic 3. Applied Creativity 5 weeks

## 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* | 10 | 30 |
| *Assessment of assignments, projects, reports, memos* | 10 | 60 |
| *Objective test* | 30 | 80 |

## GRADING CRITERIA

| ASSESSMENT SYSTEM | ORDINARY EVALUATION | EXTRAORDINARY EVALUATION |
|---|---|---|
| *Assessment of participation in class, exercises or projects of the course* | 10 | 10 |
| *Assessment of assignments, projects, reports, memos* | 45 | 45 |
| *Objective test* | 45 | 45 |

**General comments on the evaluations/assessments**

• You must attend at least 80% of the classes, as well as submit and pass at least 80% of the course work. If the student does not complete the required 80%, she loses the right to evaluation in the ordinary session. Excused absences are processed with the Academic Secretary through Zendesk. To justify an absence, you can access the following link: https://u-tadhelp.zendesk.com/hc/es/articles/4407779679890-Justificaci%C3%B3n-de-faltas-de-asistencia

• The grades for the exercises completed during the course will account for 45% of the final grade. The working document must detail the exercises and steps developed in the creative process of the project. Submissions will only be evaluated through open activities in Blackboard: exercises sent by mail or by other means will not be evaluated. It is crucial to deliver on time. 10 minutes of courtesy will be given in which the delivery is considered made on time. After this period, assignments may be submitted within a maximum of 24 hours after the scheduled date, but with a penalty on the grade that will be determined by the teacher. No deliveries will be accepted after 24 hours.

• As a final exam, the public presentation and delivery in digital format of the portfolio will be requested, which will account for 45% of the final grade. If a student does not make the public presentation, she will not approve that part, even if she participated in its preparation. These deliveries must also be made within the established deadline.

• Participation in class, self-assessment and hetero-assessment reports, and critical evaluation sessions will account for 10% of the final grade.

• Those students who fail any work may repeat it until they pass it. The delivery of the failed work will be done via Blackboard in the next call of the course, and as a deadline, on the date of the exam / ordinary final call.

• It will be necessary to approve each of the parts (class exercises/portfolio presentation) to pass the subject. Each part must have a minimum rating of 5/10.

• To pass the subject in the extraordinary call, two deliveries must be submitted (class exercises / portfolio). These deliveries will not be made in groups, but individually. The student will have to upload the documents to Blackboard and will also have to present the contents in person on the day of the exam. Both parts must have a minimum grade of 5/10 to pass. The percentage of grade associated with class participation (10% of the final grade) obtained in the ordinary call will be part of the final grade for the extraordinary call. Class exercises will account for 45% of the final grade. The portfolio will account for 45% of the final grade.

## LIST OF REFERENCES (BOOKS, PUBLICATIONS, WEBSITES):

Basic Bibliography:

Csikszentmihalyi, M. (1996) Creativity: the psychology of discovery and invention,New York, Harper Collins.

Bono, E. (2009) Six Thinking Hats, London, Penguin.

Boden, M. (2003) The Creative mind: Myths and Mechanisms, Candem, Routledge.

Recommended bibliography:

De Bono, E. (2015) Serious Creativity. Using the Power of Lateral Thinking to CreateNew Ideas, London, Vermilion.

Gardner, H. (2011) Creating Minds: An Anatomy of Creativity Seen Through the Livesof Freud, Einstein, Picasso, Stravinsky, Eliot, Graham, New York, Basic Books.

Lamata, R. (2013) La actitud creativa, Madrid, Editorial Narcea.

Wertheimer, M. (2020), Productive Thinking, Basilea, Birkhäuser.

Boden, M. (2017) Artificial Intelligence: A Very Short Introduction, London, OxfordPress

## REQUIRED MATERIALS, SOFTWARE AND TOOLS

**Type of classroom**
Theory classroom

Board and projection system

**Materials:**

Personal computer.

Book note, blank paper, pen.

**Software:**

Canva, Trello, más los programas necesarios para el desarrollo de cada proyecto