Course guide
804344 - AINT-A - Interactive Applications

Unit in charge: Image Processing and Multimedia Technology Centre
Teaching unit: 804 - CITM - Image Processing and Multimedia Technology Centre.

Degree: BACHELOR'S DEGREE IN DESIGN, ANIMATION AND DIGITAL ART (Syllabus 2017). (Compulsory subject).

Academic year: 2022  ECTS Credits: 6.0  Languages: English

LECTURER

Coordinating lecturer: Seinfeld Tarafa, Sofia
Sora Domenjó, Carles

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEAAD 9. Acquire the practical foundations of programming and apply them to tools or engines for the automation of tasks, prototyping and development of interactive audiovisual productions.
CEAAD 2. Schematically and visually represent complex concepts, ideas and/or data based on personal skills and external references, in order to convey attractiveness, originality and creativity.
CEAAD 5. Apply graphic interface design methodologies in an interactive application based on usability and accessibility criteria, taking into account the audience and the various platforms to which it can be directed.

Transversal:
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
07 AAT. SELF-DIRECTED LEARNING. Detecting gaps in one’s knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one’s knowledge.
03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
TEACHING METHODOLOGY

The teaching methodology will be based on both theoretical classes and workshops focused on the development of interactive applications (prototypes), using different techniques and digital interfaces. The workshops will be held during class time, although they will also require independent work by the students, who in some cases will have to complete projects and practical work at home.

The classes of the course include:

1. Presentation of new contents in the class and description of the study materials by the professor. Students can ask questions in relation to the contents that have been presented in class.
2. Students, working independently outside class hours, study the contents taught by the teacher, using notes and other materials provided by the teacher or obtained by the student himself.
3. Students ask questions in relation to the contents studied since the last class and review the results of the exercises or practical work developed independently. In addition to the teacher, other students can collaboratively solve doubts and review exercises of classmates. (Classroom)
4. Individual or team work, in which students initiate or continue the development of exercises, research and/or projects with the support of the professor in the classroom. (Classroom)
5. Students work independently, outside class hours, individually or in teams, to solve problems, exercises or projects.
6. Explanation, defense or revision of the exercises or projects already solved or in the process of being solved. Follow-up of the development of the projects (Classroom).
7. Carrying out theoretical exams (Classroom).

LEARNING OBJECTIVES OF THE SUBJECT

1. Understand the roles involved in the design of interactive applications (artists/designers and programmers) and identify the points of connection between the two in the development of an interactive application.
2. Understand the richness and importance of adding interaction to digital content in the context of the visual arts.
3. Have knowledge of the basic concepts in the field of interactive applications.
4. Learn to design and program interactive applications and prototypes through the use of engines and development tools, applying programming techniques and integrating graphic resources, models, animations and sounds.
5. Show sufficient reading comprehension in English, in order to understand notes, scientific articles, popular science articles, web pages, related to the class topics.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>26,0</td>
<td>17.33</td>
</tr>
<tr>
<td>Hours large group</td>
<td>18,0</td>
<td>12.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>16,0</td>
<td>10.67</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
CONTENTS

**Topic 1: Interaction and interfaces**

**Description:**
- Definition of interaction, interactivity and human-computer interaction
- Interaction design principles
- Interaction design models and affordances
- Design and evolution of digital interfaces
- Types of Interfaces: 2D, 3D, virtual and augmented reality, robots, tangibles
- Sense of agency and feedback (input, outputs, motor actions, feelings of control, cognitive bases).
- Large format interactive applications and digital art

**Full-or-part-time:** 25h
Theory classes: 10h
Self study : 15h

**Topic 2: Tangibles Interfaces**

**Description:**
- Introduction to tangible interfaces in the digital arts.
- Design principles
- Applications and examples
- Prototype development

**Related activities:**
Makey Makey + Scratch Workshop

**Full-or-part-time:** 25h
Practical classes: 10h
Self study : 15h

**Topic 3: ViRtual Reality (VR)**

**Description:**
- VR Definition
- Immersion, Presence, Plausibility and Embodiment in VR
- Interaction in VR
- Art in VR

**Related activities:**
Google Tilt Brush (Workshop)

**Full-or-part-time:** 25h
Practical classes: 10h
Self study : 15h
### Topic 4: Augmented Reality (AR)

**Description:**
- Definition of AR
- Virtual and physical world relationship, role of interaction.
- Types of AR
- Art in AR

**Related activities:**
SparkAR Workshop

**Full-or-part-time: 25h**
- Practical classes: 10h
- Self study: 15h

### ACTIVITIES

#### Makey Makey + Scratch Workshop (Practical Work)

**Description:**
This workshop will be based on learning programming principles, Arduinos, microcontrollers and electrical circuits, in order to implement a tangible interface prototype that combines art and technology.

**Full-or-part-time: 23h**
- Practical classes: 8h
- Self study: 15h

#### SparkAR Workshop (Práctica)

**Description:**
This workshop focuses on the development of Augmented Reality prototypes, using the tool Spark AR, where students can work with real world images as well as renderings of facial expressions. It is a tool that also exploits visual scripting.

**Full-or-part-time: 23h**
- Theory classes: 15h
- Practical classes: 8h

#### Google Tilt Brush Workshop

**Description:**
In this workshop, students will develop prototypes of fully immersive artwork to be displayed in Virtual Reality.

**Full-or-part-time: 23h**
- Practical classes: 8h
- Self study: 15h
GRADING SYSTEM

Projects (70%):
Development of 3 projects based on the conceptualization and implementation of interactive prototypes using different technologies. The execution and evaluation of these practices will also involve additional tasks to reinforce the concepts explained in class, such as the oral presentation of the different projects developed. The projects will be developed in groups. Specifically, students must develop the following projects: 1) Project based on a tangible interface, equivalent to 30% of the final grade, 2) Virtual reality project, equivalent to 20% of the final grade, 3) Augmented reality projects, equivalent to 20% of the final grade.

Mid-term Exam (20%):
Theoretical exam to be held on the dates established for the midterm exams. It involves studying the contents studied in class, as well as the completion of some mandatory readings.

Attitude and participation in class (10%):
The evaluation of the student's participation in the formative activities of the subject, and the attitude of learning, will be evaluated by monitoring their interventions in class and the proportion of exercises and practices presented. This evaluation corresponds to 10% of the final grade.

Re-assessment Test:
Students that after following the continuous evaluation have failed the course, will be eligible for a re-assessment test in which only the 20% corresponding to the mid-term exam will be assessed in a two-hour long test.

EXAMINATION RULES.

Projects:
The projects will begin during class time in the time slot set for this purpose and must be completed outside the scheduled class time following the instructions described in Project Exercise Sheet and given by the professor. Some of the proposed exercises must be done in groups and others individually. This will be clearly stated in the exercises/projects statements. The resolution of the practical exercises/projects will have to be uploaded to campus virtual, following the established dates and terms. At the end of the projects/practical exercises, the required files will need to be handed in (campus virtual). The correct management of the documentation provided is an aspect related to the competences to be acquired and is, therefore, subject to evaluation. The evaluation of the practical exercises does not only involve the resolution of the proposed exercises, but also the defense of the results when the student is required to do so at the beginning of the classes.

Exams:
The exam of the subject will take place in class. The questions and problems proposed in the exams refer mainly to the theoretical content of the subject, as well as to an article that the students will have to read. Content related to the different practical exercises may also be included in the exam. The total number of points in the grade for each exam question will be given. Reviews and/or complaints regarding the exams will be made exclusively on the dates and times established in the Academic Calendar.

Any incident that does not allow to solve the practical exercises or theoretical exam in the indicated term must be communicated to the corresponding professor or to the head of studies; after this communication, the pertinence or not of the causes that motivate the non-presentation of the exercise/exam will be solved and the alternatives will be established to complete the evaluation if the causes are justified. When one of the projects/practical exercises or exam is not delivered or completed on time without justification, the student will be graded with the lowest grade possible in the corresponding to the activity.
BIBLIOGRAPHY

Basic:

RESOURCES

Hyperlink:

Other resources:
Scientific Publications: