



# **ACADEMIC PROGRAM**

## **CG PROJECT DEVELOPMENT**

### **B.F.A. IN ANIMATION**

***MODALITY: ON CAMPUS***

***ACADEMIC YEAR: 2023-2024***

<b>Name of the course:</b>	<b>CG Project Development</b>
Degree :	Animation
Location:	Centro Universitario de Tecnología y Arte Digital
Area:	Advanced 3D Techniques for Animation
Year:	3º
Teaching period:	1
Type:	OBM
ECTS credits:	6
Teaching modality:	On campus
Language:	English
Lecturer / Email	Gonzalo Martín Sánchez/gonzalo.sanchez@u-tad.com
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## SUBJECT DESCRIPTION

### Area description

This subject is mandatory for the students that choose the Mention in Backend Animation Pipeline techniques.

This subject will allow the students who choose it to deepen the knowledge acquired in 3D techniques in the common part of the bachelor's degree applied to the final processes of 3D animation content production, known as Backend Pipeline. These processes, which without losing their technical component incorporate a high technical content, include lighting, compositing, 3D effects simulation, character effects (cloth, hair, fur) and the preparation of the character for animation through the Rigging process.

### Subject description

In this course the student will acquire the theoretical contents necessary for the realization of projects, both in the processes of production, financing and marketing of a project, as well as those necessary for the organization, control and monitoring of production. The course aims at carrying out a team work conceiving, planning, developing and producing animation contents.

The dynamics allows each student to focus their work in the areas of greater specialization related to the mention they have chosen and their professional interest, while learning to communicate their work to other colleagues, and also to understand the specialized work of other areas.

The monitoring of the projects is done through weekly meetings and the presentation of partial results periodically according to the planned milestones. In these meetings the students will present internally to the rest of the team and to the teachers and tutors the contents developed as part of the project. This communication of results is developed continuously to validate, and if necessary correct, the progress of each project.

This dynamic allows to encourage participation and effort in the students. It also facilitates the development of the student's portfolio or the demonstrative reel of their work, which is a requirement and common practice in the sector for the hiring of professionals.

## COMPETENCIES AND LEARNING OUTCOMES

### Competencies

#### BASIC AND GENERAL

CG4 - Apply the aesthetic and perception fundamentals of the image in terms of structure, form, color and space in the representation of digital content.

CG8 - Optimize the work according to the technological resources related to the processes and tools of the project to be developed.

CB1 - That students have demonstrated to possess and understand knowledge in an area of study that starts from the basis of 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.

CB2 - That students know how to apply their knowledge to their work or vocation in a professional manner and possess the skills that are 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) to make judgments that include reflection on relevant social, scientific or ethical issues.

CB4 - Students should be able to convey information, ideas, problems and solutions to both specialized and non-specialized audiences.

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

#### TRANSVERSALS

CT3 - Know the hardware and software fundamentals of computers and communication networks, as well as the principles of storage and cloud computing along with their usefulness and application to the development projects of the digital economy.

CT4 - Update the knowledge acquired in the management of digital tools and technologies according to the current state of the sector and the technologies used.

CT5 - Demonstrate versatility, flexibility and creativity in the development of projects, activities and works.

CT6 - Develop collaborative projects in a climate of teamwork based on respect, cooperation and responsibility.

#### SPECIFIC

CE16 - Know the concepts and apply the tools and techniques that allow the introduction of visual effects in an audiovisual project.

SC17 - Use texturing techniques to apply materials to 3D models.

SC2 - Know and apply the fundamentals of photography, its elements of visual composition and the expressive value of lighting.

CE7 - Create audiovisual pieces applying the principles of composition, audiovisual narrative and graphics animation to the realization, planning, editing and post-production of sequences and shots.

CE10 - Create images with a high level of finish using the most appropriate tools for the project of which it is part.

CE11 - Use the theory, techniques and tools associated with lighting, rendering and composition.

#### SPECIFIC TO THE MENTION

Students who choose this subject will acquire the following specific competences of the mention (CE3D):

- CE3D1: Build 3D Rigs from a given model.
- CE3D2: Know the internal structure of 3D scenes and be able to generate interfaces and automation of effects in 3D software through code.
- CE3D3: Know the methodologies and the main dynamic simulation tools for the creation of 3D visual effects.

#### **Learning outcomes**

At the end of the degree, the graduate will be able to:

- Apply visual language to the different animation techniques to convey ideas.
- Know the syntax and basic use of programming languages applied to rigging and particle simulation.
- Manage the interaction between different materials and lighting systems in 3D and 2D creation environments.
- Create environments with a high degree of verisimilitude through the use of layers, alphas and other basic digital compositing techniques.
- Identify software and hardware requirements for lighting, rendering and compositing.
- Integrate with visual consistency the various elements involved in a 2D or 3D layered composition in the post-production phase of the project.
- To integrate convincingly synthetic images, created with digital tools, and real images, recorded photographically.
- Determine the emitting elements, collisions and fields of particle systems in the creation of visual effects.
- Simulate the dynamic elements and situations involved in atmospheric phenomena, such as clouds, fog, rain, smoke, fire, or in the breakage and destruction of rigid solid bodies by collisions or explosions.
- Optimize the programming code used in an animation scene using the necessary debugging tools.

- Program elements in a 2D or 3D scene for the simulation of visual effects or the technical optimization of scenes.
- Manage texture libraries for reuse in an animation scene.
- Combine the qualities of various materials such as reflection, refraction and specularity for the creation of shading.
- Apply the required textures and shaders convincingly and according to the needs of the production in the various parts of a 3D animation scene such as sets, objects or characters.
- Determine the chain of relationships in the construction of body, facial and node controls that are part of a 3D skeleton or rig.
- Establish the skinning of the different parts of a 3D model.
- Use different techniques of bone construction in 3D models according to the needs of character and object animation.
- Generate the character pickers or synoptics necessary for other members of a 3D production to manipulate 3D elements.
- Modify and debug the programming codes of a 3D animation scene.
- Automate the generation of digital effects in a 3D animation scene.
- Determine the different fields involved in collisions and particle interactions in the post-production phase of an audiovisual project.
- Control the dynamics and parameters involved in the simulation of fluids in a 3D animation scene.
- Establish the necessary elements in the creation of breaks and fractures in rigid models in a 3D simulation.
- Create clean and optimized modeling meshes in the creation of 3D objects, figures and environments.

## **CONTENTS**

- Production and management of CG projects
- Working pipeline for CG pre-production
- Ideas, script and narrative development
- Previsualization and camera planning
- Script breakdown, scheduling and quotas
- The 3D animation industry.

## **SUBJECT SYLLABUS**

Pre-production and development of a 3D animated short film:

Inspiration and brainstorming

Script development

- The animation pitch
- Production in animation projects:
  - Team building
  - Script breakdown and quotas
- Pre-production processes and development of a 3D animated short film:
  - Storyboarding and animation development
- Art direction of a 3D animated short film:
  - R&D and choice of style
  - Environment concepts
  - Model sheets
  - Follow-up of pre-production processes: Dailies

## TRAINING ACTIVITIES AND TEACHING METHODOLOGIES

### TRAINING ACTIVITIES

LEARNING ACTIVITIES	Total hours	Hours of presence
<i>Theoretical / Expository classes</i>	22,00	22,00
<i>Practical classes</i>	33,75	33,75
<i>Tutorials</i>	4,25	2,13
<i>Independent study and autonomous work of the student</i>	35,00	0,00
<i>Elaboration of work (group or individual)</i>	50,75	0,00
<i>Evaluation Activities</i>	4,25	4,00
<b>TOTAL</b>	150	61,88

### Teaching methodologies

- Expository method or master class
- Case method
- Problem-based learning
- Cooperative or collaborative learning

Inquiry-based learning

Flipped classroom or inverted classroom methodology

Gamification

## TEMPORAL DEVELOPMENT

Inspiration and brainstorming -1-4 weeks

## EVALUATION SYSTEM

ASSESSMENT SYSTEM	MINIMUM SCORE RESPECT TO THE FINAL ASSESSMENT (%)	MAXIMUM SCORE RESPECT TO THE FINAL ASSESSMENT (%)
<i>Assessment of participation in class, exercises or projects of the course</i>	10	20
<i>Assessment of assignments, projects, reports, memos</i>	30	60
<i>Objective test</i>	30	60

## GRADING CRITERIA

ASSESSMENT SYSTEM	ORDINARY EVALUATION	EXTRAORDINARY EVALUATION
<i>Assessment of participation in class, exercises or projects of the course</i>	20	20
<i>Assessment of assignments, projects, reports, memos</i>	40	40
<i>Objective test</i>	40	40

### General comments on the evaluations/assessments

Each short film production team must consist of: at least two co-directors and at least one producer. There are no restrictions to include more people in the role of co-directors or co-producers.

The role of the co-directors is: to make artistic and narrative decisions; to review assignments and provide feedback; to approve shots; to direct the team.

-The producer's role is to: manage the production; assign tasks to the crew; ensure that the production stays on schedule.

-Directors and producers must maintain close communication throughout the production of the short film. Therefore: co-directors cannot make decisions without first consulting with production.

-It is much more important for a short film to be finished than for a shot to be perfect because of delays.

No one can ignore the planning and tasks set by the producer, not even co-directors.

-Any detection of plagiarism in a work or exam will result in a zero for that work, a report to the faculty and academic coordinator and the application of the current regulations, which can lead to very serious penalties for the student.

-It is crucial to hand in assignments on time. A 10-minute courtesy period will be given during which the hand-in is considered to be on time. After this time, work may be handed in within 24 hours of the deadline, but with a penalty on the mark which will be determined by the teacher. No work will be accepted after 24 hours.

-When a short film project is late / running late:

Co-directors lose autonomy to make decisions and the producer takes over the project until it is back on schedule.

The producer acquires the power to raise quotas and approve plans.

Co-directors can only ask for a maximum of one revision in all processes, except: two revisions in the blocking animation phase, a maximum of one in the blocking+ phase and a maximum of one in the refined phase.

After the maximum number of revisions, the producer can approve the plans even if the co-directors do not agree.

Only when the production of the short film project is back on schedule, the producer can agree (if he/she deems it appropriate) to revise again some of the approved shots or elements that the co-directors were less happy with (so-called "Could-Be-Better" or CBB shots).

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

Basic:

CANTOR, Jeremy; VALENCIA, Pepe (2004): Inspired 3D short film production. PremierPress, Thomson Course Technology.

RODRÍGUEZ RODRÍGUEZ, Alberto (2010): 3D animation projects. AnayaMultimedia.

Recommended bibliography:

BROWN, Blain (2016): Cinematography: Theory and Practice: Image Making for Cinematographers and Directors: Volume 3. Routledge.

COTTE, Olivier (2007): Secrets of Oscar-winning Animation: Behind the scenes of 13 classic short animations. Focal Press.

SULLIVAN, Karen (2008): Ideas for Short Film Animation with DVD: Finding and Building Stories. Focal Press



## REQUIRED MATERIALS, SOFTWARE AND TOOLS

### Type of classroom

Theory

### Materials:

Display - Digital whiteboard, Laptop

### Software:

Shotgrid VR, Autodesk Maya, Adobe