ACADEMIC PROGRAM

ORGANIC MODELING

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

MODALITY: ON CAMPUS

ACADEMIC YEAR: 2023-2024

Name of the course:	Organic Modeling
Degree :	Animation
Location:	Centro Universitario de Tecnología y Arte Digital
Area:	Digital Creation Techniques
Year:	2º
Teaching period:	2
Type:	OB
ECTS credits:	6
Teaching modality:	On campus
Language:	English
Lecturer / Email	David Fernández Barrúz / david.barruz@u-tad.com
Web page:	http://www.u-tad.com/

SUBJECT DESCRIPTION

Area description

This subject provides the student with the knowledge of the procedures, techniques and digital artistic tools for the creation of characters and digital environments, using modeling techniques for three-dimensional representation in virtual environments and texturing and shading for the simulation of the representation of textures and materials of the digital object or character in the field of animation. In the subject of digital creation techniques the student also acquires the knowledge and skills necessary to create narrative content, applying the principles of audiovisual language to an environment of cameras and 3D elements, as well as their lighting and digital composition.

Subject description

The Organic Modeling course is the natural continuation of the Object Modeling course. Based on the knowledge acquired in 3D modeling techniques, this course deals with them in greater depth and introduces new concepts, which are essential for the creation of characters. The course is complemented with Texturing and Shaders and in higher courses with the subjects of Lighting and rendering. This course is oriented to provide a theoretical and practical knowledge of 3D modeling tools, both polygonal and organic, that every animation professional should know and master.

COMPETENCIES AND LEARNING OUTCOMES

Competencies

BASIC AND GENERAL

CG11 - Know the legal framework of the professions associated with the degree.

GC3 - Participate in the management of projects linked to the design and development processes of a digital product.

GC7 - Knowing the employability resources of the professions associated with the degree.

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

CG9 - Use the techniques and artistic tools associated with the generation of digital content.

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 - That students can transmit 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

CT1 - To know the definition and scope, as well as to put into practice the fundamentals of the methodologies of management of technological development projects.

CT2 - To know the main agents of the sector and the complete life cycle of a project in development and commercialization of digital content.

CT4 - Update the knowledge acquired in the use 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.

SPECIFIC

CE17 - Use texturing techniques to apply materials to 3D models.

SC4 - Represent three-dimensional forms and spaces using the essential techniques of traditional and digital modeling.

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.

CE9 - Use modeling techniques for the three-dimensional representation of shapes from a design.

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

Learning outcomes

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

- Identify the impact of new digital media in today's society.

- Handle with ease digital tools for the creation of images, videos, modeling and artistic works.

- Use various techniques of artistic expression such as drawing, 3D modeling and postproduction for the generation of digital content.

- Model objects or figures with different techniques, whether digital or traditional.

- Represent objects and spaces in 3D through modeling, texturing, lighting and digital rendering.

- Apply the basic techniques of digital modeling to the creation of objects, figures and 3D environments with clean and optimized modeling meshes.

- Manage the interaction between different materials and lighting systems in 3D and 2D creative 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.

- Apply the required textures and shaders convincingly and according to the needs of the production to the various parts of a 3D animation scene such as sets, objects or characters.

- Apply the fundamentals of visual language to the digital environment.

- Adapt the anthropometric and proportion rules used in other arts such as architecture or painting for the recreation of a virtual landscape.

CONTENTS

· Topology:

· Modeling and reference: measures and breakdowns.

· Strategies: Curved objects, axial and radial symmetry.

· Environments, grid, units and modularity.

· Mapping.

· Optimization: economy and low poly.

SUBJECT SYLLABUS

Topic 1. Introduction to Zbrush

Why work with Zbrush?

Let's get to know Zbrush.

General shortcuts.

Zbrush models.

Customize interface

Main brushes

Masks and Selections

Polygroups

Symmetries

Mirrors

TransPose Gizmo 3D: Move, Rotate, Scale

Working with Subtools

Theme 2. Making a Creature Bust

 Using references in ZGrid

 Primary Volumes with Dynamesh

From Dynamesh to SubDivisions

 Model Detailing

 Materials and MatCaps

 Polypaint and Spotlight

 UVMaster Plugin

 Import - Export: UV's in Maya

 Exporting Modeling and Maps

 Basic Rendering in ZbrushUNIT 303. Human Anatomy03.01. Introduction

 Project Organization: Effective Pipeline

 Concept art03.02. BlockOut Technique

 Introduction to Human Anatomy

 Subtools

 Materials and color03.03. Anatomy of the human body

 Study of the musculature of the human body

Creation of main muscles: Study of male and female Ecorché

Secondary Volumes with Subdivisions

Detailing

Polypaint

Theme 3. Fabrics, clothing and accessories

Essential concepts: points of tension, gravity and movement.

Types of folds: tube, loose and stretched

Working with patterns

Detailing

Topic 4. Solid surfaces

Hardsurface Technique

Introduction to ZModeler

Topic 5. Seamless Retopology in Maya and Other Platforms

Prepare the modeling for rigging

Topic 6. Final Project: Create your Character for Animation

Posing

Polypaint and Spotlight

Study of facial expressions

Study mobility and dynamism

Views as references

Rigging

Posing

Detailing of all Character and elements

Final presentation

TRAINING ACTIVITIES AND TEACHING METHODOLOGIES

TRAINING ACTIVITIES

LEARNING ACTIVITIES	Total hours	Hours of presence
Theoretical / Expository classes	24,00	24,00
Practical classes	30,00	30,00
Tutorials	5,20	2,60

Independent study and autonomous work of the student	38,00	0,00
Elaboration of work (group or individual)	48,00	0,00
Evaluation Activities	4,80	5,00
TOTAL	150	61,6

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

Theme 1-2 weeks

Theme 2- 3 weeks

Topic 3- 3 weeks

Theme 4- 3 weeks

Theme5- 3 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	20
Assessment of assignments, projects, reports, memos	20	60

Objective test	30	70

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

Submitting assignments on time is critical. There will be a 10 minute grace period. Students may turn in assignments up to 24 hours late, but will receive a grade penalty determined by the professor. After 24 hours, no work will be accepted.

Any case of plagiarism detected in assignments or exams will result in receiving a failing grade of zero on that submission, informing the faculty and academic coordinators and applying the current regulations, which can lead to very serious penalties.

LIST OF REFERENCES (BOOKS, PUBLICATIONS, WEBSITES):

Basic:

VAUGHAN, William 2012, Digital Modelling. Anaya Multimedia

KOENIGSMARCK, Arndt von 2008, Creation and modelling of 3D characters. Anaya Multimedia

Recommended:

On Line Editora Escultura Digital - ZBrush Ed.01: Guia Curso Básico. ASIN:B06XHC49GX3D

TOTAL PUBLISHING. 2017, Beginner´s guide to Zbrush, 3dtotal Publishing,3dtotal.com Ltd, 29 Foregate Street, Worcester, WR1 1DS, UK. ISBN: 978-1-909414-50-1

3D TOTAL PUBLISHING. 2015, Anatomy for 3D artists. The essential guide for CGProfessionals, 3dtotal Publishing, 3dtotal.com Ltd, 29 Foregate Street, Worcester, WR11DS, UK. ISBN: 978-1-909414-4-2

BLAIR, Preston 1994, Cartoon animation, Walter Foster Publishing, Inc, 23062 LaCadena Drive, Laguna Hills, CA 92653. ISBN: 1-56010-084-2

3D TOTAL PUBLISHING. 2012, ZBrush Character Sculpting: Volume 1, 3dtotalPublishing, 3dtotal.com Ltd, 29 Foregate Street, Worcester, WR1 1DS, United Kingdom.ISBN: 978-0-9551530-8-2

3D TOTAL PUBLISHING. 2014, Zbrush Characters & Creatures, 3dtotal Publishing,3dtotal.com Ltd, 29 Foregate Street, Worcester, WR1 1DS, United Kingdom. ISBN: 978-1-909414-13-6

3D TOTAL PUBLISHING. 2016, Sculpting from Imagination: Zbrush, 3dtotalPublishing, 3dtotal.com Ltd, 29 Foregate Street, Worcester, WR1 1DS, United Kingdom.ISBN: 978-1-909414-33-4

3D TOTAL PUBLISHING. 2015, Anatomy for 3D artists. The essential guide for CGProfessionals, 3dtotal Publishing, 3dtotal.com Ltd, 29 Foregate Street, Worcester, WR11DS, UK. ISBN: 978-1-909414-4-2

Recommended web links:

ANATOMY FOR SCULPTORS - https://anatomy4sculptors.com/3D TOTAL - https://3dtotal.com/Rafael Grassetti - https://rgrassetti.com/Daniel Bell - https://www.artstation.com/danibelFrank Tzeng - https://www.artstation.com/frank_tzengRenaud Galand - https://www.artstation.com/renaudgalandYoshuke Ishikawa - https://www.artstation.com/ishikawa_cgPinterest - https://www.pinterest.es/5. Materials, software and tools neededClassroom type: Materials: Software:Computer roomProjection equipment and blackboardBlackboard virtual roomPersonal computerWebcam, computer and microphoneGraphic tabletMaya 2022 with RenderArnoldZbrushPhotoshop

REQUIRED MATERIALS, SOFTWARE AND TOOLS

Type of classroom
Theory

Materials:
Display - Digital whiteboard, Laptop

Software:
Autodesk Maya, Arnold Render, Zbrush, Photoshop