ACADEMIC PROGRAM

GEOMETRIC REPRESENTATION SYSTEMS

B.F.A. IN ANIMATION

MODALITY: ON CAMPUS

ACADEMIC YEAR: 2023-2024

Name of the course:	Geometric Representation Systems
Degree :	Animation
Location:	Centro Universitario de Tecnología y Arte Digital
Area:	Artistic Fundamentals
Year:	1º
Teaching period:	2
Type:	OB
ECTS credits:	6
Teaching modality:	On campus
Language:	English
Lecturer / Email	Paloma Rodera Martínez / paloma.rodera@u-tad.com
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SUBJECT DESCRIPTION

Area description

 The subject Artistic Foundations provides the students with the necessary fundaments for a digital graphics creator: identification and historical context of artistic currents, knowledge of color, light and photography, three-dimensional representation of space and learning of the basis and classical principles of animation and visual development. Knowledge and learning of traditional principles and techniques is one of the essential basis for training professionals to be able to adapt and take advantage of the progress of digital animation technology.

Subject description

Geometric Representation Systems is the subject where students learn the graphic-technical languages of measurement and representation systems and their application to the field of video games, animation, design, entertainment and art. The course provides students with technical tools for the construction of graphic worlds and their representation. The technical measurement and representation systems are the basis of digital graphic environments and their knowledge is essential for the complete understanding of 2D and 3D digital graphic tools and the need to know how to represent in a two-dimensional plane a threedimensional space or object and vice versa. Its knowledge is essential for all professions in which the graphic factor is involved as a draftsman, designer, animator, computer graphics, illustrator, concept art...

COMPETENCIES AND LEARNING OUTCOMES

Competencies

BASIC AND GENERAL

CG1 - Critically understand the interrelationships between the different arts and their currents of thought throughout history and the evolution of aesthetic, historical and cultural values.

CG2 - Know the vocabulary and concepts inherent to the digital art field.

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

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 base of general secondary education, and is usually found at a level that, while relying on 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 competencies 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 a 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

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

SPECIFIC

CE18 - Devise, design and capture, through drawing, the design and construction of environments, landscapes and scenarios for their construction in 3D.

CE5 - Apply the traditional principles of animation to the digital animation of characters and other elements.

SC1 - Perform drawing with traditional and digital techniques of artistic creation for both ideation and representation of images.

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

CE4 - Represent three-dimensional forms and spaces using the essential techniques of traditional and digital modeling. digital modeling techniques.

SC6 - Use the principles and techniques of artistic creation for the conceptualization, design and development of characters, environments, vehicles and props.

CE8 - Apply technical drawing to the representation of parts or spaces.

Learning outcomes

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

- Analyze artistic works taking into account aesthetic principles and cultural context.

- Interpret the visual and compositional language of a digital artwork.

- Use basic traditional drawing techniques such as charcoal, graphite or watercolor to represent images.

- Apply the physical and aesthetic principles of color in artistic and narrative creation.

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

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

- Develop strategies for continuous and autonomous training in new techniques and tools of the profession of an animator.

- Adapt the knowledge of traditional drawing techniques to digital environments.

- Draw with exclusively digital means and tools for the representation of images applied to the animation industry.

- Use the visual language applied to the different animation techniques to transmit ideas.

- Represent the physical environment, natural figures and objects through drawing with traditional or digital techniques.

- Apply the laws of representation systems for the visualization of objects, figures and spaces.

- Understand and use the photographic language for the creation of artistic and narrative images.

- Use light as a narrative and dramatic element in the creation of photographic images with knowledge of its physical principles.

- Operate a photographic camera according to its principles of operation for the creation of artistic images.

- Design characters through the visual expression of their psychological characteristics.

- Design environments, locations and atmospheres through the visual expression of their characteristics.

- Represent on a two-dimensional plane a three-dimensional space or object according to the systems of representation.

- Discriminate the volumetric, chromatic, space and environment interrelations that occur between the characters and physical spaces used in an animation

scene.

- Apply ideation and creativity techniques to artistic production such as flow state or lateral thinking.

CONTENTS

· Representation of space, volumes and forms.

· Dihedral measuring system: flat figures and geometric bodies, intersections, abatement, magnitudes and turns.

· Axonometric representation systems: isometric, symmetric and trimetric. Parts and shadows.

· Conic representation systems: history of perspective, human vision, figures, sections and shadows.

· Applications: dynamic perspectives, anamorphosis.

SUBJECT SYLLABUS

Unit 1. Projection systems. Fundamentals of descriptive geometry.

1.1. Projections. Their classes.

1.2. Systems of representation.

Unit 2. Conic perspective systems.

2.1. History of perspective and geometry.

2.2. Perspective elements.

2.3. Frontal conic perspective.

2.4. Oblique conic perspective.

2.5. Perspective of inclined planes.

2.6. Shadows.

2.7. The human figure in perspective.

2.8. Dynamic perspectives.

Unit 3. Dihedral measurement systems.

3.1 Representation of point, line and plane.

3.2 Belongings and intersection.

3.3 Parallelism and perpendicularity.

3.4 Dihedral operability: changes of plane,

3.5 Abbatiments and true magnitude.

3.6 Geometric Bodies: polyhedra and radiused surfaces.

3.7 Plane sections.

Unit 4. Axonometric perspective systems.

4.1. Representation of point, line and plane. 4.2.

4.2. Orthogonal axonometric perspective: isometric, dimetric and trimetric.

4.3. Oblique axonometric perspective: cavalier and military.

4.4. Construction of parts and views of an object.

4.5. Shadows.

TRAINING ACTIVITIES AND TEACHING METHODOLOGIES

TRAINING ACTIVITIES

LEARNING ACTIVITIES	Total hours	Hours of presence
Theoretical / Expository classes	31,25	31,25
Practical classes	23,75	23,75
Tutorials	4,50	2,25
Independent study and autonomous work of the student	47,50	0,00
Elaboration of work (group or individual)	37,50	0,00
Evaluation Activities	5,50	6,00
TOTAL	150	63,25

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 1-3 weeks

Theme 2- 3 weeks

Theme 3- 4 weeks

Theme 4- 4 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	60	60
Objective test	30	30

General comments on the evaluations/assessments

To pass the course, students must demonstrate at the end of the term that they have understood the principles of classical animation and that they are able to apply them in their projects. They must actively participate in class and make an effort, whatever their level of drawing.

The delivery of all exercises will be compulsory. In spite of the mark, the student will fail the first exam if any exercise has not been handed in, if he/she has not attended 50% of the classes or if he/she has failed the final exercise. In such cases, the student must present the failed or undelivered work (including the final exercise) at the extraordinary exam session for revision.

LIST OF REFERENCES (BOOKS, PUBLICATIONS, WEBSITES):

Principal:

D´amelio, J. (2003). Perspectiva Darwing Handbook. Dover Publications Inc.

Gutiérrez, A et al. (1984). Dibujo Técnico. Manuales de orientación universitaria. Anaya S.A.

Izquierdo, F. (1996). Geometría Descriptiva. Dossat S.A.

Taibo, A. (2010). Geometría descriptiva y sus aplicaciones. Curvas y superficies.

Gonzalez Monsalve, M y Palencia Cortes, J. (1991). Geometría descriptiva. Ed. Museo Nacional Art Catalunya

Gonzalez Monsalve, M y Palencia Cortes, J. (2006). Trazado Geométrico (Dibujo Técnico I). Ed. Autor-Editor

Recomendada:

Anderson, D.(2014). "Graphics in Design & Communication". Gill & Macmillan.

Beltrán, J et al.(2010). "Sistema diédrico. Técnicas educativas con ayudas 3D en el espacio real y su simulación en el espacio virtual". Pixel-Bit. Revista de medios y educación, 36, 151-170.

Izquierdo, F. (1997). Ejercicios de Geometría Descriptiva IV. Editorial Paraninfo.

Mateu-Mestre, M. (2016). Framed Perspective Volume 1. Design Studio Press.

Mateu-Mestre, M. (2016). Framed Perspective Vol. 2: Technical Drawing for Shadows, Volume, and

Characters. Design Studio Press.

Navarro, J. (2000). Mirando a través. La perspectiva a través de las artes.

Serbal.

Navarro, J. (1978). El juego de las representaciones. Dpto. Publicaciones de la Escuela Técnica Superior de Arquitectura.

Norling, R. (1999). Perspesctive made easy. New York: Dover Publications Inc.

Lucasfilm Ltd-Rinzler, J. W.-Johnston, J. (2014). Star Wars Storyboards: Te Original Trilogy. Ed. Abrams & Chronicle Books

Sorenson, J. (2021). Transformres. Una Historia Visual. Ed. Norma Editorial S. A.

REQUIRED MATERIALS, SOFTWARE AND TOOLS

Type of classroom
Theory

Materials:
A3 notebook for technical drawing

- A4 sheets of white paper

- Set of rulers: graduated ruler or scalimeter, square and bevel (Faber Castell, Staedtler or similar) without bevel. A Burmester curve template (Faber Castell, Staedtler or similar) is recomme

Software:
Power Point y Adobe Acrobat Reader