1. OVERVIEW

Subject Area	Geometric Representation Systems
Degree	Bachelor's Degree in Design
School/Faculty	Faculty of Architecture, Engineering and Design
Year	First
ECTS	6 ECTS
Type	Core
Language(s)	Spanish/English
Delivery Mode	On campus
Semester	Second
Academic Year	2024-2025
Coordinating professor	

2. INTRODUCTION

This subject deals with geometric representation systems in the field of design. Development and handling of geometric, analytic and descriptive information common to a design project: Scales and geometric representation systems in the field of design. Development and handling of information common to a geometric design project: drawing and 3-D representation. 2-D geometry: Design manipulation and alternatives. 3-D geometry: Design manipulation and alternatives, shades and surfaces. The subject is divided into three teaching units: Two analogue methods using manual drawing techniques (diedric system, axonometric projection and conical shapes) and the last one based on CAD tools.

3. SKILLS AND LEARNING OUTCOMES

Key skills (CB, by the acronym in Spanish):

- CB1: Students have shown their knowledge and understanding of a study area that builds on general secondary school education, and are usually at the level where, with the support of more advanced textbooks, they may also demonstrate awareness of the latest developments in their field of study.
- CB2: Students can apply their knowledge to their work or vocation in a professional manner and possess the skills which are usually evident through the forming and defending of opinions and resolving problems within their study area.
- CB3: Students have the ability to gather and interpret relevant data (usually within their study area) to form opinions which include reflecting on relevant social, scientific or ethical matters.
- CB4: Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.
- CB5: Students have developed the learning skills necessary to undertake further study in a much more independent manner.

Transversal skills (CT, as per the Spanish acronym):

- CT1: Independent Learning: the ability to choose the most effective strategies, tools and opportunities for independent learning and implementation of what they have learnt.
- CT2: Self-confidence: ability to evaluate their own results, performance and skills with the self-determination necessary to complete tasks and meet any objectives.
- CT 3: Ability to adapt to new circumstances: being able to evaluate and understand different points of view, taking different approaches to suit the situation.
- CT4: Ability to analyse and synthesize: being able to break down complex problems into manageable blocks; also evaluating alternatives and perspectives to find the ideal solution. Synthesizing to reduce the complexity and better understand the situation and/or solve problems.
- CT 8: Information processing: ability to seek, choose, analyse and integrate information from diverse sources.
- CT13: Problem solving: ability to resolve an unclear or complex issue or situation which has no established solution and requires skill to reach a conclusion.
- CT 18: Use of information and communication technology (ICT): ability to effectively use information and communication technology such as search tools, processing and storing information, as well as developing communication skills.

Specific skills (CE, as per the Spanish acronym):

- CE2: Ability to apply concepts of metric and projective geometry
- and systems of spatial representation to design.
- CE3. Ability to use graphic representation techniques as a form of analysis, conception, communication and expression in design.
- CE4. Ability to use IT tools for representing both 2-D and 3-D objects and spaces.
- CE5: Ability to apply knowledge of physics, dimensioning, numerical calculus, analytical geometry and basic algebra in design projects.
- CE7: Understanding of theories of shape and composition to create designs to suit user needs and requirements, ensuring they respect the relationship between shape, function and the context in which they are used.

Learning outcomes (RA, as per the Spanish acronym):

- RA1: Students will learn to: Represent and analyse shapes and images shown on a planar projection surface (two-dimensional). Understand the basic principles and applications of drawing, colour and design in 2-D with particular emphasis on the relationship with human behaviour and response.
- RA3: Understand and apply correct use of scales, size and proportion in a design and its representation.
- RA5: Understand and apply the systems of spatial representation and their relationship with graphic conceptualisation and visual expression in the different phases of design and architectural rendering with complete understanding of projection skills.
- RA13: Understand the graphic representation techniques applied to object design and spaces.

The following table shows how the skills developed in the subject area match up with the intended learning outcomes:

Skills	Learning outcomes
CB1, CB2, CB3, CB4, CB5 CT1, CT2, CT3, CT4, CT8, CT13, CT18 CE2, CE3, CE4, CE5, CE7	RA1: Students will learn to: Represent and analyse shapes and images shown on a planar projection surface (two-dimensional). Understand the basic principles and applications of drawing, colour and design in 2-D with particular emphasis on the relationship with human behaviour and response.

CB1, CB2, CB3, CB4, CB5 CT1, CT2, CT3, CT4, CT8, CT13, CT18 CE2, CE3, CE4, CE5, CE7	RA3: Understand and apply correct use of scales, size and proportion in a design and its representation.
CB1, CB2, CB3, CB4, CB5 CT1, CT2, CT3, CT4, CT8, CT13, CT18 CE2, CE3, CE4, CE5, CE7	RA5: Understand and apply the systems of spatial representation and their relationship with graphic conceptualisation and visual expression in the different phases of design and architectural rendering with complete understanding of projection.
CB1, CB2, CB3, CB4, CB5 CT1, CT2, CT3, CT4, CT8, CT13, CT18 CE2, CE3, CE4, CE5, CE7	RA13: Understand the graphic representation techniques applied to object design and spaces.

4. CONTENTS

- Introduction to the topic, learning guide and course layout. Introduction to the diedric system.
- Computer aided design and drafting. Introduction to AutoCAD.
- Axonometric system, conical shapes and plane geometry.

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Master lecture.
- Problem-based learning (PBL)
- Project-based studies (PBS)
- Learning based on workshop teaching

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On-campus:

Learning activity	Number of hours
Attendance and participation in activities	12.5h (on-site)
Directed learning, practical exercises and problem-solving	50h (20% on-site)
Project presentation	12.5h (on-site)
Integrated group project	12.5h (off-site)
Research work and projects	12.5h (off-site)
Self-study	25h (off-site)
Tutorials, academic follow-up and assessment	25h (on-site)
TOTAL	150 h

7. ASSESSMENT

The assessment methods, plus their weighting in the final grade for the course, are as follows:

On-campus:

Assessment method	Weight
Submission and/or presentation of projects	90-100%

On the Virtual Campus, when you open the course, you can see all the details of your assessment activities and the deadlines and assessment procedures for each activity.

7.1. Ordinary examination period

To pass the course in the ordinary examination period you must obtain a grade of 5.0 or more out of 10.0 in the final grade (weighted average) for the subject.

In all cases, you must obtain a grade higher than or equal to 4.0 in all course activities to show a minimum level of achievement in each of the course subject areas.

7.2. Extraordinary examination period

To pass the course in the extraordinary examination period you must obtain a grade of 5.0 or more out of 10.0 in the final grade (weighted average) for the subject.

Activities not passed in the ordinary examination period, or those not delivered, must now be delivered after having received the relevant corrections to them by the lecturer.

There will also be a test.

8. SCHEDULE

The schedule with delivery dates of assessable activities in the course is indicated in this section:

Assessable activities	Date
Activity 1: Diedric representation systems	Week 1 to 7
Activity 2: Computer-aided design	Week 2 to 14
Activity 3: Axonometric system, conical shapes and plane geometry.	Week 8 to 12

The schedule may be subject to modifications for logistical reasons of the activities. Students will be informed of any changes in due time and course.

9. BIBLIOGRAPHY

The recommended bibliography is indicated below:

- ARNHEIM, Rudolf. Arte y percepción visual. Psicología de la visión creadora. Eudeba, Buenos Aires, 1971.
- CHING, Frank. Arquitectura: forma, espacio y orden. Gustavo Gili, Barcelona.
- MUNARI, Bruno. Diseño y comunicación visual. Barcelona. GG 1979
- Asensi, Izquierdo. Geometría descriptiva. GG, Madrid 2018
- Asensi, Izquierdo. Ejercicios de Geometría Descriptiva. GG, Madrid 2018

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

The Educational Guidance and Diversity Unit offers support throughout your time at university to help you with your academic achievement. One of the main pillars of our educational policy is the inclusion of students with special educational needs, universal accessibility to the different university campuses and equal opportunities.
This unit offers students:

1. Support and monitoring through personalised counselling and programmes for students who need to improve their academic performance.
2. Promotion of diversity, with curricular changes possible in terms of methodology or assessment for those students with special educational needs in order to provide equal opportunities for all our students.
3. We also offer students a range of educational extracurricular resources for developing a variety of skills to enhance their personal and professional development.
4. Career guidance by offering tools and advice to students with doubts regarding their professional careers or those who believe they have chosen the wrong line of study.

Students who need educational support can contact us at:
orientacioneducativa@universidadeuropea.es

11. SATISFACTION SURVEYS

Your opinion matters!

Universidad Europea encourages you to complete our satisfaction surveys to identify strengths and areas for improvement for staff, degree courses and the learning process.

These surveys will be available in the surveys area of your virtual campus or by email.

Your opinion is essential to improve the quality of the course.

Many thanks for taking part.