Course guide
310703 - 310703 - Introduction to Architectural Drawing

Last modified: 20/09/2023

Unit in charge: Barcelona School of Building Construction
Teaching unit: 752 - RA - Departamento de Representación Arquitectónica.

Degree: BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2019). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: PEDRO MON TAILLANT

Others: JANINA PUIG COSTA
PEDRO MON TAILLANT

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. FE-1 Ability to understand and make the graphical documentation of a project, to do data gathering, surveying of plans and geometric control of construction units.
2. FE-2 Knowledge of the infographic and cartographic procedures and methods in the construction field.

TEACHING METHODOLOGY

A theory class will be given in which the subject will be developed (in one or two sessions) followed by a practice session directed by the professor on the topic presented.
The practice will be done individually. The professor will give some rules and standards for solving the practice and will help the students so that they can achieve the objectives of the exercise.
The independent learning of the study will consist on the completion of the activities of the same difficulty with total autonomy, or with the help of the mentor on small student groups.

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course, students should be able to:

· Graphically analyse through a representation system an architectural element of the space, in a freehand paper form.
· Explain the meaning of the following concepts: sketch, proportion, interpretation, line, dimensioning, linear system, fold line system, and dimensioning system.
· Relate the different projection planes, the use of the different plane changes and auxiliary views.
· Define the suitable point of view for a perspective, as well as the vanishing points.
· Identify the representation systems.
· Use the suitable methods in order to carry out freehand drawing and the representation of a scaled plan.

STUDY LOAD

Type	Hours	Percentage
Hours large group	18,0	12.00
Hours medium group	42,0	28.00
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

Content 1: Introduction to building drawing

Description:
1. Representation systems:
Difference between oblique, cylindrical and orthogonal projections.
Types of representation systems:
· Dihedral system (cylindrical orthogonal projection)
-AUTOCAD
· Dimension line system (contour lines concept)
· Axonometric system (isometric projection, Din-5, cavalier projection and cabinet projection)
-SKETCHUP
· Conic projection (vanishing point concept, point of view)
2. Space representation
Graphic representation functions:
· Idea concept. Paper reflections.
· Idea communication.
· Objective description of the object.
· Analytic drawing. Geometric construction lecture.
-SKETCHUP

Specific objectives:
To know the development of the spacial view that allows the idea of figures and volumes in a three-dimensional space.
To know the geometric methods that allow the figure's and volume's representations in a three-dimensional space with different representation systems.

Related activities:
Done the first week.
Activities: 1,2 and 9.

Full-or-part-time: 15h 30m
Theory classes: 2h
Practical classes: 4h
Guided activities: 1h 30m
Self study : 8h

Content 2: Object representation.

Description:
The dihedral and axonometric projections, two complementary systems.
· Go from one system to the other.
· Geometric operations: identify lenghts areas and angles.
Graphic lift
· Introduction to freehand lift drawing.
· Fitting.
· Proportion.

Specific objectives:
To know the analysis methods and figures and volume's descriptions.
To know the application of the architecture representation systems.
The proportionality. Knowledge of floor, elevation and cross plans with dihedral system.

Related activities:
Done the second week.
Activities 3, 4 and 9.

Full-or-part-time: 16h 30m
Theory classes: 3h
Practical classes: 4h
Guided activities: 1h 30m
Self study : 8h

Content 3: Simple volumes in dihedral and axonometric projections

Description:
SPACIAL INTERPRETATION.
· Floor plan.
· Elevation plan. Detail drawing.
· Drawing convention, scale concepts.
· Graphic scales.
· Representation depending on the detail level, according to the blueprint scale.
· The sketch as a knowledge tool.

Specific objectives:
To know how to:
· Use the axonometric projections.
· Use the dimension line system and its applications.

Related activities:
Done the third week.
Activities 5, 6 and 9.

Full-or-part-time: 16h 30m
Theory classes: 3h
Practical classes: 4h
Guided activities: 1h 30m
Self study : 8h

Content 4: Roof drawing.

Description:
DIMENSION LINE SYSTEM:
· Slope and contour line concepts.
· Plane intersection and area development.

Specific objectives:
To know the analysis methods and the figures and volumes description.
To know how to apply the representation systems in architecture.

Related activities:
Done in the fourth and fifth week.
Activities 7, 8 and 9.

Full-or-part-time: 15h 30m
Theory classes: 2h
Practical classes: 4h
Guided activities: 1h 30m
Self study : 8h

Content 5: Figures Analysis

Description:
REGULAR POLYHEDRON

1 PYRAMID AND PRISMS AS A FORMAL BASE OF INDUSTRIAL AND ARCHITECTURE DESIGNS:
· Magnitudes and systems (regular and irregulars)
· Developments
· Geodesic

2 CYLINDER AND CONE AS A FORMAL BASE OF INDUSTRIAL AND ARCHITECTURE DESIGNS:
· Surface of revolution (revolution axis)
· Contour definition in dihedral projection system: tangents.
· Plane sections as a conic curves definition: circumference, ellipse, parabola and hyperbole (notable points)

3 SPHERE REPRESENTATION:
· Contour definition in dihedral projection system: tangents.
· Plane sections as a conic curves definition: circumference, ellipse (notable points)
· Geodesic

Specific objectives:
To know the analysis methods and the figures and volumes description.
To know how to represent the representation systems in architecture.

Related activities:
Done during the forth and fifth week.
Activities 10, 11 and 12.

Full-or-part-time: 23h 15m
Theory classes: 3h
Practical classes: 6h
Guided activities: 2h 15m
Self study : 12h

Content 6: Interpretation and representation of construction elements.

Description:
FORMAL AND CONSTRUCTIVE INTERPRETATION
· Graphic blueprint drawing method
· Alternative resources: proportions based on floor plan, modulation of cladding or proportional comparison of different objects based on known elements.
· Elevations, roof and section plans. Scale transformation.
· Dimension line application in sketches.

SCALE CONCEPT:
· Standard scales of object representation: 1/1, 1/2, 1/5, 1/10, 1/20

Specific objectives:
To know the analysis methods and the figures and volumes description.
To know how to represent the representation systems in architecture.
Train the student to know the correct representation of dihedral system and architectural drawings, as well as architectural rises and the use of resources.

Related activities:
Done during the seventh and eighth week
Activities 13 and 14.

Full-or-part-time: 15h 30m
Theory classes: 2h
Practical classes: 4h
Guided activities: 1h 30m
Self study : 8h

Content 7: Architectural element representation on indoor spaces.

Description:
INDOOR SPACE SKETCH AND DRAWING:
· Blueprint drawing methodology: triangulation.
· Alternative resources: proportions or proportional comparison of different objects based on known elements (door height 2-2.1m / height / room).
· Closings of the vertical sections.
· Stairs drawing.

Specific objectives:
To know the analysis methods and the figures and volumes description.
To know how to represent the representation systems in architecture.
To know the correct representation of dihedral system and architectural drawings.
To know the resources to represent to scale the data taken from construction.

Related activities:
Done during the ninth week.
Activity 15.

Full-or-part-time: 15h 30m
Theory classes: 2h
Practical classes: 4h
Guided activities: 1h 30m
Self study : 8h

Content 9: Stair representation and other constructive elements.

Description:
STAIR REPRESENTATION
· Dihedral: proportion of the steps by Tales Theorem.
· Physical description: stairs size and elevation of steps, landing representation.
· Blueprint representation method: triangulation and level crossings.

OTHER CONSTRUCTIVE ELEMENTS
· Constructive details and different ways of representation.

Specific objectives:
To know how to draw stairs.
To know how to represent different constructive elements depending on the use.

Related activities:
Activity 21.

Full-or-part-time: 7h 45m
Theory classes: 1h
Practical classes: 2h
Guided activities: 0h 45m
Self study : 4h

Content 10: Field integrated solutions.

Description:
All the steps in order to execute a medium building will be described, from the exhaustive data gathering on a freehand sketch, scale up of the drawing, the confection of a conical perspective until the representation of its shades.
All the resources of knowledge of each step will be explained and applied.

Specific objectives:
To know all the theoretical content of the course and its application.

Related activities:
Done during the last three weeks.
Activities 21-26.

Full-or-part-time: 38h 45m
Theory classes: 5h
Practical classes: 10h
Guided activities: 3h 45m
Self study : 20h

Content 8: conical perspective

Description:
Content 8: conical perspective

Full-or-part-time: 23h 15m
Theory classes: 3h
Practical classes: 6h
Guided activities: 2h 15m
Self study : 12h

ACTIVITIES

A1 SIMPLE VOLUME STUDY. SKETCHUP

Description:
Exercises done in the classroom, individually, with a 2 hour duration. The exercises will be about the contents of the theory: volumetric elements with axonometric system for the resolution of different projections.
There will also be brainstorming exercises analyzing the object, to improve critical thinking on the student's side.

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.

Material:
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...
Technical drawing support material, like: set-square, rule, engineer's scale, compass...
Paper DIN A4 and DIN A3.
Topic available in ATENEA Campus.

Delivery:
Delivery of the completed exercises on the due date set by the professor.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.
It will take two days to complete the exercises.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A2 SPACE REPRESENTATION (CONTENT 1). AUTOCAD . SKETCHUP.

Description:
Exercises done in the classroom, individually, with a 2 hour duration. The exercises will be about the contents of the theory: volumetric elements with axonometric system for the resolution of different projections.
There will also be brainstorming exercises analyzing the object, to improve critical thinking on the student's side.

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.

Material:
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...
Technical drawing support material, like: set-square, rule, engineer's scale, compass...
Paper DIN A4 and DIN A3.
Topic available in ATENEA Campus.

Delivery:
Delivery of the completed exercises when the professor sets up.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.
It will take two days to complete the exercises.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A3 USEFUL RELATIONSHIP BETWEEN TWO REPRESENTATION SYSTEMS (DIHEDRAL AND AXONOMETRIC SYSTEMS CONTENT 2)

Description:
Individual realization in the classroom of different freehand drawings of simple elements, represented in axonometric, and find their representations in dihedral.
Indivial realization in the classroom of different freehand drawings of simple elements, represented in dihedral, and find their representations in axonometric.
Correction by the teacher.

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal and axonometric systems.
· Have spatial vision.

Material:
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...
Freehand drawing method available in ATENEA Campus.

Delivery:
Delivery of the completed exercises when the professor sets up.
Learning prove of the students made by the professor with all the results of the exercises. The exercises will be returned to students corrected.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A4 HOW TO MAKE FREEHAND DRAWINGS OF CONSTRUCTIVE ELEMENTS (CONTENT 2)

Description:
Individual working on the classroom of different freehand drawings and simple elements in relation to the construction (bricks, for example) represented with dihedral and axonometric systems.
Exercises corrected by the professors.

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.

Material:
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...
Freehand drawing method available in ATENEA Campus.

Delivery:
Delivery of the completed exercises on the due date set by the professor.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A5 APPLICATION OF THE FREEHAND DRAWING FUNDAMENTALS (CONTENT 3)

Description:
Individual realitzation in class hours: drawing of a natural object on dihedral and ortogonal system (freehand drawing). Some of the objects will be studied in axonometric (with the different possibilities that the system provides).
Exercises corrected by the professors.

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal and axonometric systems.
· Have spatial vision.

Material:
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...
Freehand drawing method available in ATENEA Campus.

Delivery:
Delivery of the completed exercises on the due date set up by the professor.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A6 USEFULNESS OF AXONOMETRIC SYSTEM (CONTENT 3)SKETCHUP

Description:
Individual working on the classroom: resolution of volumes in axonometric system.
Later there will be given similar exercises to the students so that they can solve them at home.

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.

Material:
Technical drawing support material, like: set-square, rule, engineer's scale, compass...
Paper DIN A4 and DIN A3.
Topic available in ATENEA Campus.

Delivery:
Delivery of the completed exercises when the professor sets up.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A7 DIMENSION LINE SYSTEM (CONTENT 4)

Description:
Individual working on the classroom: exercises for the application of the dimension line system (roofs and lots).
Later there will be given similar exercises to the students so that they can solve them at home.

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.
To know the different regular polyhedron and its representation on space.
To know the distance, angles and space position concepts.

Material:
Technical drawing support material, like: set-square, rule, engineer's scale, compass...
Paper DIN A4 and DIN A3.
Topic available in ATENEA Campus.

Delivery:
Delivery of the completed exercises when the professor sets up.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Laboratory classes: 0h 45m
Self study: 4h

A8 HOW TO DRAW ROOFS WITH DIMENSION LINE SYSTEM

Description:
Individual working on the classroom: exercises for the application of the dimension line system (roofs and lots).
Later there will be given similar exercises to the students so that they can solve them at home.

Specific objectives:
To know the different regular polyhedron and its representation on space.
To know the distance, angles and space position concepts.

Material:
Technical drawing support material, like: set-square, rule, engineer's scale, compass...
Paper DIN A4 and DIN A3.
Topic available in ATENEA Campus.

Delivery:
Delivery of the completed exercises when the professor sets up.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A9 PARTIAL TEST 1 (CONTENTS 1,2,3,4)

Description:
Individual test divided in two parts: basic technical concepts of the course (90 min duration) and freehand drawing of the contents of the course (3 hours duration).

Specific objectives:
Spatial view
Basic figure drawing
Basic sketch concepts

Material:
Wordings of the two parts, technical drawing materials (set-square, rule, engineer's scale, compass etc.)
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...

Delivery:
Test resolution. It is worth a 20% of the final course mark.

Full-or-part-time: 13h
Practical classes: 6h
Self study: 7h

A10 REGULAR POLYHEDRON, PYRAMID AND PRISM (CONTENT 5)

Description:
Exercise to find the areas of symmetric planes. Dimension lines of the regular polyhedron (pyramid and prism)

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.
To know the regular polyhedron and its space representation
To know the distance, angles and space position concepts.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.)
DINA3 and DINA4 paper.
Notes: Lesson 4: Figures. Regular Polyhedrons.
Solved exercises: Symmetric section of a polyhedron.

Delivery:
Delivery of the completed exercises when the professor sets up.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A11 REGULAR POLYHEDRONS, REVOLUTION FIGURES AND SPHERES

Description:
Exercise to find surfaces of symmetry planes through plane changes and to dimension distances of a regular polyhedron (Figures of revolution and sphere).

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.
To know the regular polyhedron and its space representation
To know the distance, angles and space position concepts.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.)
DINA3 and DINA4 paper.
Notes: Lesson 4: Figures. Regular Polyhedrons.
Solved exercises: Symmetric section of a polyhedron.

Delivery:
Delivery of the completed exercises when the professor sets up.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A12 REGULAR POLYHEDRONS, THE CUBE AND THE TETRAHEDRON (CONTENT 5)

Description:
Exercise to find the areas of symmetric planes. Dimension lines of the regular polyhedron (cubes and tetrahedrons)

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.
To know the regular polyhedron and its space representation
To know the distance, angles and space position concepts.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.)
DINA3 and DINA4 paper.
Notes: Lesson 4: Figures. Regular Polyhedrons.
Solved exercises: Symmetric section of a polyhedron and the respective drawings.

Delivery:
Delivery of the completed exercises when the professor sets up.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A13 FREEHAND DRAWING IN OUTDOORS (CONTENT 6)

Description:
Freehand drawing of outside elements.
Analysis methods and description of figures and volumes.
Application of the representation systems.
Teach the students how to apply the studied concepts of proportionality, interpretation, dimension lines and the correct utilization of graphite hardness. Furthermore, the application of the dihedral system projections.
The professors correct the exercises and, in the next class, a general reflection of the typical mistakes is given.

Specific objectives:
At the end of the practice students should be able to:
· Represent elements in space with the dihedral orthogonal system.
· Have spatial vision.
Stairs, roofs and slopes representation.
Plane section representation.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.)
DINA3 and DINA4 paper.
Notes: Lesson 4: Figures. Regular Polyhedrons.
Solved exercises: Symmetric section of a polyhedron.

Delivery:
Delivery of the completed exercises when the professor sets up.
Learning prove of the students made by the professor with all the results of the exercises. The exercises will be returned to students corrected.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A14 SCALE CONCEPT (CONTENT 6)AUTOCAD

Description:
Transcribe in paper (through scale concepts and blueprint resolution with the suitable graphic tools) sketch model of session 12, choosing the most suitable.
The work will have all the necessary projections to define the object. A graphic scale will be included.

Specific objectives:
To know how to transcribe a freehand drawing with a blueprint formal representation through the different graphic methods.
Verify the difficulties of transcribing from a sketch to a blueprint.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.)
Drawing method guidelines available in ATENEA Campus

Delivery:
Delivery of the completed exercises when the professor sets up.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A15 AND 16 FREEHAND DRAWING IN INDOORS (CONTENT 7)

Description:
Freehand drawing of inside elements.
Analysis methods and description of figures and volumes.
Application of the representation systems.
Teach the students how to apply the studied concepts of proportionality, interpretation, dimension lines and the correct utilization of graphite hardness. Furthermore, the application of the dihedral system projections.
The professors correct the exercises and, in the next class, a general reflection of the typical mistakes is given.

Specific objectives:
Representation of indoor architectonic elements.
Plane section representation, triangulation and stairs.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.)

Delivery:
Delivery of the completed exercises on the due date set up by the professor.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 13h 30m
Practical classes: 4h
Guided activities: 1h 30m
Self study: 8h

A17 SHADES AND CONIC PERSPECTIVES (CONTENT 8)

Description:
Exercises of the point of view, plane and vanishing point.
Shade construction.
Restitutions.

Specific objectives:
Choose the best point of view for a good perspective
To know the mechanisms for the execution of the perspective
Necessary restitution.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.).
Drawing method available in ATENEA Campus.

Delivery:
Delivery of the completed exercises on the due date set up by the professor.
Teacher's record of verification of the student's directed learning and results of the proposed exersices. The exercises will be returned to students and corrected and corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A18 SHADES AND CONIC PERSPECTIVES (CONTENT 8)

Description:
Exercises of the point of view, plane and vanishing point.
Shade construction.

Specific objectives:
Choose the best point of view for a good perspective.
To know the mechanisms for the execution of the perspective.
To know the mechanisms for the application of shades in axonometric and dihedral system.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.).
Drawing method available in ATENEA Campus.

Delivery:
Delivery of the completed exercises on the due date set up by the professor.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Laboratory classes: 0h 45m
Self study: 4h

A19 SHADES AND CONIC PERSPECTIVES (CONTENT 8)

Description:
Exercises of the point of view, plane and vanishing point.
Shade construction

Specific objectives:
Choose the best point of view for a good perspective
To know the mechanisms for the execution of the perspective
To know the mechanisms for the application of shades in axonometric and dihedral system.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.)
Drawing method available in ATENEA Campus

Delivery:
Delivery of the completed exercises on the due date set up by the professor.
Teacher's record of the verification of the student's directed learning and results of the proposed exercises. The exercises will be returned to students corrected and with the corresponding feedback.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A20 PARTIAL TEST (CONTENTS 5,6,7,8)

Description:
Individual test divided in two parts: basic technical concepts of the course (90 min duration) and freehand drawing of the contents of the course (3 hours duration).

Specific objectives:
Spatial view
Basic figure drawing
Basic sketch concepts

Material:
Wordings of the two parts, technical drawing materials (set-square, rule, engineer's scale, compass etc.)
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...

Delivery:
Test resolution. It is worth a 20% of the final course mark.

Full-or-part-time: 13h
Practical classes: 6h
Self study: 7h

A21 STAIRS DESIGN (CONTENT 9)

Description:
Stair design exercise keeping in mind:
Dihedral, step proportion by Tales theorem.
Physic description: steps height and deepness, landings.
Blueprint drawing method: triangulation and scale.
Application of the representation systems studied.
Teach the students how to apply the studied concepts of proportionality, interpretation, dimension lines and the correct utilization of graphite hardness. Furthermore, the application of the dihedral system projections.

Specific objectives:
Inside representation of the architectonic elements
Interpretation of plane sections, triangulation and scales.

Material:
Technical drawing materials (set-square, rule, engineer's scale, compass etc.)
Drawing method available in ATENEA Campus

Delivery:
Delivery of the completed exercises when the professor sets up.
Learning prove of the students made by the professor with all the results of the exercises.

Full-or-part-time: 6h 45m
Practical classes: 2h
Guided activities: 0h 45m
Self study: 4h

A 22,23,24,25,26 FIELD INTEGRATED SOLUTIONS (CONTENT 10)

Description:
Explanation of the steps to build a medium building, its conic perspective and its shades representation.
Explanation of the processes and resources to make a correct presentation.

Specific objectives:
This work is done in order to put on practice the knowledge of the course, considering which would be the next course lessons.
This work is aimed at the student, for this will show them how to manage the knowledge acquired and its usefulness, orienting the capacities learned to the courses the student will have to take on the following years.

Material:
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...
Freehand drawing method available in ATENEA campus

Delivery:
During 5 weeks, corrections will be carried out in order to make a correct execution of the work.
It will be delivered the last week of the course, correctly bound, included on the course notebook.
It will be corrected and evaluated.

Full-or-part-time: 33h 45m
Practical classes: 10h
Guided activities: 3h 45m
Self study: 20h

A27 PARTIAL TEST 3

Description:
Individual test outside the classroom that will cover the contents of the course and the learning skills acquired.
Individual test divided in two parts: basic technical concepts of the course (90 min duration) and freehand drawing of the contents of the course (3 hours duration).

Specific objectives:
Application of the concepts of freehand drawing
Application of the representation systems: dihedral, axonometric, conic etc.

Material:
Problem formulation of the two parts, drawing material.
Freehand drawing support material, like: wooden board, rubber, pencil with different hardness, sharpener...

Delivery:
Test resolution. It is worth a 20% of the final course mark.

Full-or-part-time: 10h 15m
Practical classes: 2h
Self study: 8h 15m

GRADING SYSTEM

The evaluation of the students will be continous.
The class practices and autonomous practices will be evaluated.
Two evaluation sessions will be held during the course
All the work will be collected in a portfolio.
The final mark of the subject is obteined by these percentages:

Practices at class: 20%
Autonomous practices: 20%
1st Exam: 30%
2nd Exam: 30%
The final mark will be the addition of all the %.
If the student at the end of the evaluation does not meet the proposed objectives, they will be tested on a re-evaluation exam provided that their mark is not less than 3.5 and attendance and delivery of work has been done regularly.

EXAMINATION RULES.

It is compulsory to submit the 80% of all the practices.

BIBLIOGRAPHY

Basic:
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- Hansmann, Christine-Ruth. Las Escaleras en la arquitectura : construcción y detalles. Barcelona: Ed. Gustavo Gili, 1994.
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- Schaarwächter, Georg. Perspectiva para arquitectos. Barcelona: Ed. Gustavo Gili, 1990.
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- Thomae, Reiner. Perspectiva y axonometría. Barcelona: Ed. Gustavo Gili, 1985.
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- Villanueva Bartrina, L. Perspectiva lineal : su relación con la fotografía. Barcelona: Edicions UPC, 1996.

RESOURCES

Hyperlink:
- https://www.icgc.cat/. Maps
- https://www.autodesk.es/. Software Autodesk
- http://www.sedecatastro.gob.es/. Maps
- https://www.sketchup.com/. Software Sketchup