



# UNIVERSITÀ DEGLI STUDI DI PALERMO

|                                     |                                                                                                                                                                                                    |                                 |                  |
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| <b>DEPARTMENT</b>                   | Architettura                                                                                                                                                                                       |                                 |                  |
| <b>ACADEMIC YEAR</b>                | 2020/2021                                                                                                                                                                                          |                                 |                  |
| <b>BACHELOR'S DEGREE (BSC)</b>      | INDUSTRIAL DESIGN                                                                                                                                                                                  |                                 |                  |
| <b>SUBJECT</b>                      | DESIGN AND COMPUTER REPRESENTATION - WORKSHOP                                                                                                                                                      |                                 |                  |
| <b>TYPE OF EDUCATIONAL ACTIVITY</b> | A                                                                                                                                                                                                  |                                 |                  |
| <b>AMBIT</b>                        | 50233-Formazione di base nella rappresentazione                                                                                                                                                    |                                 |                  |
| <b>CODE</b>                         | 20309                                                                                                                                                                                              |                                 |                  |
| <b>SCIENTIFIC SECTOR(S)</b>         | ICAR/17                                                                                                                                                                                            |                                 |                  |
| <b>HEAD PROFESSOR(S)</b>            | DI PAOLA FRANCESCO                                                                                                                                                                                 | Professore Associato            | Univ. di PALERMO |
|                                     | CANNELLA MIRCO                                                                                                                                                                                     | Ricercatore a tempo determinato | Univ. di PALERMO |
|                                     | ABBATE TOMMASO                                                                                                                                                                                     | Professore a contratto          | Univ. di PALERMO |
|                                     | AVELLA FABRIZIO                                                                                                                                                                                    | Professore Associato            | Univ. di PALERMO |
| <b>OTHER PROFESSOR(S)</b>           |                                                                                                                                                                                                    |                                 |                  |
| <b>CREDITS</b>                      | 10                                                                                                                                                                                                 |                                 |                  |
| <b>INDIVIDUAL STUDY (Hrs)</b>       | 130                                                                                                                                                                                                |                                 |                  |
| <b>COURSE ACTIVITY (Hrs)</b>        | 120                                                                                                                                                                                                |                                 |                  |
| <b>PROPAEDEUTICAL SUBJECTS</b>      |                                                                                                                                                                                                    |                                 |                  |
| <b>MUTUALIZATION</b>                |                                                                                                                                                                                                    |                                 |                  |
| <b>YEAR</b>                         | 1                                                                                                                                                                                                  |                                 |                  |
| <b>TERM (SEMESTER)</b>              | Annual                                                                                                                                                                                             |                                 |                  |
| <b>ATTENDANCE</b>                   | Mandatory                                                                                                                                                                                          |                                 |                  |
| <b>EVALUATION</b>                   | Out of 30                                                                                                                                                                                          |                                 |                  |
| <b>TEACHER OFFICE HOURS</b>         | <b>AVELLA FABRIZIO</b><br>Tuesday 10:00 13:00<br><br><b>CANNELLA MIRCO</b><br>Wednesday 10:30 13:30<br><br><b>DI PAOLA FRANCESCO</b><br>Tuesday 15:00 17:00 Presso il Dipartimento di Architettura |                                 |                  |

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|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PREREQUISITES</b>          | Basic notions of flat geometry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>LEARNING OUTCOMES</b>      | <p>Knowledge and understanding skills<br/>The student will need to know the methods of representation, the construction of Flat and three-dimensional figures and manual representation techniques computer.</p> <p>Ability to apply knowledge and understanding<br/>The student must know the simple and complex geometric forms. He will be able to handle methods and techniques of representation. The student will have to use the computerized procedures suitable for building models of surfaces and solids and manage their flat and three-dimensional representation. He will also need to know the shading and rendering techniques.</p> <p>Judgment autonomy<br/>The student will be able to choose which modeling methods, of projection and which techniques will be the most suitable for the representation of a project. It will also be set to choose the scale of adequate representation, appropriate techniques and criteria for representation.</p> <p>Communicative Skills<br/>We want to bring the student to know how to convey, using their own codes of the drawing discipline, the description of the design project.</p> <p>Learning Skills<br/>At the end of the course the student will be able to know and apply the criteria Of representation by means of manual procedures and informatiche.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>ASSESSMENT METHODS</b>     | <p>The oral test consists of an interview, and in the presentation of drawings, aimed at ensuring the possession of the competences and the disciplinary knowledge provided by the course; The evaluation is expressed in thirtieths.</p> <p>Examining will have to answer at least two or three questions posed orally, on all parts of the program, with reference to the suggested texts.</p> <p>Applications will tend to verify: a) the knowledge and understanding acquired; B) the ability to elaborate, c) the possession of adequate exhibition capacity, d) the autonomy of judgment</p> <p>Distribution of votes:<br/>30 - 30 and praise</p> <p>A) Advanced knowledge of topics and critical understanding of theories of the principles of discipline<br/>B) Advanced ability to apply knowledge and solve problems also proposed in an innovative way<br/>C) Full ownership of specific language<br/>D) Capacity to organize work autonomously and innovatively</p> <p>26 - 29<br/>A) Comprehensive and specialized knowledge accompanied by awareness criticism<br/>B) Complete ability to apply acquired knowledge and to develop Creative solutions to abstract problems<br/>C) Good command of specialist language<br/>D) Ability to organize work autonomously</p> <p>22 - 25<br/>A) Knowledge of principles, processes and general concepts of teaching<br/>B) Basilari has the ability to apply methods, tools, materials and information related teaching<br/>C) Basic mastery of specialized language<br/>D) Basilari has the ability to organize the work autonomously</p> <p>18-21<br/>A) Minimum knowledge of the main subjects of the teaching<br/>B) Minimum ability to apply the acquired knowledge independently<br/>C) Minimal mastery of technical language<br/>D) Minimal ability to organize the work autonomously</p> |
| <b>EDUCATIONAL OBJECTIVES</b> | <p>The course aims to provide the student with the knowledge and application tools in order to be able to represent architectural and architectural objects, both with techniques manuals that with computer techniques, knowing the methods of rejection and presentation and techniques suitable for communicative purposes requests.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>TEACHING METHODS</b>       | Lectures, exercises.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>SUGGESTED BIBLIOGRAPHY</b> | <p>Avella F., Elementi teorici per il disegno informatico, Janotek, L'Aquila 2009<br/>Docci M., Gaiani M., Maestri D., Scienza del disegno, Citta' studi edizioni, Novara 2011</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

Estratto da Tedeschi, A. AAD Algorithms-Aided Design. Parametric strategies using grasshopper, Edizioni Le Pensur, Brienza (PZ) 2014.  
Caraccia F., Metodi di modellazione NURBS con Rhinoceros, Janotek, L'aquila 2006.

## SYLLABUS

| Hrs | Frontal teaching                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 30  | 3 Plane geometry<br>3 Hand drawing tools<br>3 Freehand drawing<br>3 Monge projections<br>3 Oblique axonometry<br>3 Orthogonal axonometry<br>3 Perspective projections<br>3 Flat section<br>3 Axonometric and perspective section<br>3 Representation codes                                                                                                                                                                                                                                                                                                          |
| 16  | 3 Construction and editing of plane curves: elementary curves, splines, NURBS.<br>4 NURBS surface construction: extrusion, simple revolution and on rails, sweep, loft, network of curves.<br>3 Construction of elementary and compound solids: surface offset, Boolean operations, solid section, three-dimensional transformations.<br>3 Editing solids and surfaces: fillet fillet of edges, blend blend; conditions of continuity (position, tangency, curvature).<br>3 Flat projections of 3D models, dimensioning, printing layout, representation scales.    |
| 12  | 4 Parametric modeling: dimensional parameters of generating curves.<br>4 Parametric modeling: pattern.<br>4 Parametric modeling: attractor points.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 12  | 3 Construction of a scene, types of light sources<br>3 Channels for mapping a material: roughness, reflection, displacement, transparency.<br>3 Ambient occlusion, bounces, HDRI<br>3 Post-production raster images.                                                                                                                                                                                                                                                                                                                                                |
| Hrs | Practice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 15  | 4 Orthogonal projections<br>4 Axonometric projections<br>4 Perspective projections<br>3 Flat, axonometric and perspective sections                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 15  | 3 Construction and editing of plane curves: elementary curves, splines, NURBS.<br>3 NURBS surface construction: extrusion, simple revolution and on tracks, sweeps, lofts, network of curves.<br>3 Construction of elementary and compound solids: surface offset, Boolean operations, solid section, three-dimensional transformations.<br>3 Editing of solids and surfaces: fillet fillet of edges, blend blend; conditions of continuity (position, tangency, curvature).<br>3 Flat projections of 3D models, dimensioning, print layout, representation scales. |
| 8   | 3 Parametric modeling: dimensional parameters of generating curves.<br>3 Parametric modeling: pattern.<br>2 Parametric modeling: attractor points.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 12  | 3 Construction of a scene, types of light sources. 3 Channels for mapping a material: roughness, reflection, displacement, transparency. 3 Ambient occlusion, bounces, HDRI. 3 Post-production raster images.                                                                                                                                                                                                                                                                                                                                                       |

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| <b>PREREQUISITES</b>          | Basic notions of flat geometry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>LEARNING OUTCOMES</b>      | <p>Knowledge and understanding skills<br/>The student will need to know the methods of representation, the construction of Flat and three-dimensional figures and manual representation techniques computer.</p> <p>Ability to apply knowledge and understanding<br/>The student must know the simple and complex geometric forms. He will be able to handle methods and techniques of representation. The student will have to use the computerized procedures suitable for building models of surfaces and solids and manage their flat and three-dimensional representation. He will also need to know the shading and rendering techniques.</p> <p>Judgment autonomy<br/>The student will be able to choose which modeling methods, of projection and which techniques will be the most suitable for the representation of a project. It will also be set to choose the scale of adequate representation, appropriate techniques and criteria for representation.</p> <p>Communicative Skills<br/>We want to bring the student to know how to convey, using their own codes of the drawing discipline, the description of the design project.</p> <p>Learning Skills<br/>At the end of the course the student will be able to know and apply the criteria Of representation by means of manual procedures and informatiche.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>ASSESSMENT METHODS</b>     | <p>The oral test consists of an interview, and in the presentation of drawings, aimed at ensuring the possession of the competences and the disciplinary knowledge provided by the course; The evaluation is expressed in thirtieths.</p> <p>Examining will have to answer at least two or three questions posed orally, on all parts of the program, with reference to the suggested texts.</p> <p>Applications will tend to verify: a) the knowledge and understanding acquired; B) the ability to elaborate, c) the possession of adequate exhibition capacity, d) the autonomy of judgment</p> <p>Distribution of votes:<br/>30 - 30 and praise<br/>A) Advanced knowledge of topics and critical understanding of theories of the principles of discipline<br/>B) Advanced ability to apply knowledge and solve problems also proposed in an innovative way<br/>C) Full ownership of specific language<br/>D) Capacity to organize work autonomously and innovatively<br/>26 - 29<br/>A) Comprehensive and specialized knowledge accompanied by awareness criticism<br/>B) Complete ability to apply acquired knowledge and to develop Creative solutions to abstract problems<br/>C) Good command of specialist language<br/>D) Ability to organize work autonomously<br/>22 - 25<br/>A) Knowledge of principles, processes and general concepts of teaching<br/>B) Basilari has the ability to apply methods, tools, materials and information related teaching<br/>C) Basic mastery of specialized language<br/>D) Basilari has the ability to organize the work autonomously<br/>18-21<br/>A) Minimum knowledge of the main subjects of the teaching<br/>B) Minimum ability to apply the acquired knowledge independently<br/>C) Minimal mastery of technical language<br/>D) Minimal ability to organize the work autonomously</p> |
| <b>EDUCATIONAL OBJECTIVES</b> | <p>The course aims to provide the student with the knowledge and application tools in order to be able to represent architectural and architectural objects, both with techniques manuals that with computer techniques, knowing the methods of projection and presentation and techniques suitable for communicative purposes requests.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>TEACHING METHODS</b>       | Lectures, exercises.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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## SYLLABUS

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| 12  | 3 Construction of a scene, types of light sources<br>3 Channels for mapping a material: roughness, reflection, displacement, transparency.<br>3 Ambient occlusion, bounces, HDRI<br>3 Post-production raster images.                                                                                                                                                                                                                                                                                                                                                |
| Hrs | Practice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 15  | 4 Orthogonal projections<br>4 Axonometric projections<br>4 Perspective projections<br>4 Flat, axonometric and perspective sections                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| <b>ASSESSMENT METHODS</b>     | <p>The oral test consists of an interview, and in the presentation of drawings, aimed at ensuring the possession of the competences and the disciplinary knowledge provided by the course; The evaluation is expressed in the thirtieths.</p> <p>Examining will have to answer at least two or three questions posed orally, on all parts of the program, concerning the suggested texts.</p> <p>Applications will tend to verify: a) the knowledge and understanding acquired; B) the ability to elaborate, c) the possession of adequate exhibition capacity, d) the autonomy of judgment</p> <p>Distribution of votes:</p> <p>30 - 30 and praise</p> <p>A) Advanced knowledge of topics and critical understanding of theories of the principles of discipline<br/>B) Advanced ability to apply knowledge and solve problems also proposed in an innovative way<br/>C) Full ownership of specific language<br/>D) Capacity to organize work autonomously and innovatively<br/>26 - 29</p> <p>A) Comprehensive and specialized knowledge accompanied by the awareness criticism<br/>B) Complete ability to apply acquired knowledge and to develop Creative solutions to abstract problems<br/>C) Good command of specialist language<br/>D) Ability to organize work autonomously<br/>22 - 25</p> <p>A) Knowledge of principles, processes and general concepts of teaching<br/>B) Basilar can apply methods, tools, materials, and information related teaching<br/>C) Basic mastery of specialized language<br/>D) Basilar can organize the work autonomously<br/>18-21</p> <p>A) Minimum knowledge of the main subjects of the teaching<br/>B) Minimum ability to apply the acquired knowledge independently<br/>C) Minimal mastery of technical language<br/>D) Minimal ability to organize the work autonomously</p> |
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| <b>TEACHING METHODS</b>       | Lectures, exercises.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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## SYLLABUS

| Hrs | Frontal teaching                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| 12  | 4 Parametric modeling: dimensional parameters of generating curves.<br>4 Parametric modeling: pattern.<br>4 Parametric modeling: attractor points.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 12  | 3 Construction of a scene, types of light sources<br>3 Channels for mapping a material: roughness, reflection, displacement, transparency.<br>3 Ambient occlusion, bounces, HDRI<br>3 Post-production raster images.                                                                                                                                                                                                                                                                                                                                                |
| Hrs | Practice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 15  | 4 Orthogonal projections<br>4 Axonometric projections<br>4 Perspective projections<br>3 Flat, axonometric and perspective sections                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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