Syllabus
Course description

Course title	Digital Design: 3D CAD Advanced
Course code	97097
Scientific sector	INF/01
Degree	Bachelor in Design and Art (L-4)
Semester	Winter semester 2024/2025
Year	2nd and 3rd year
Credits	6
Modular	No

Total lecturing hours	60

Total hours of self-study and/ or other individual educational activities	about 90
Attendance	not compulsory but recommended
Prerequisites	To have passed the Drawing 3D CAD exam.
Maximum number of students per class	30

Course description	*The course belongs to the class "caratterizzante" in the major in Design.* The "Digital Design: 3D CAD advanced" course will be organized around three primary pillars: 1. Advanced Surface Modeling. 2. Poly/modeling for rapid 3D-sketching. 3. Rendering & Animation These pillars will be examined gradually throughout the semester, allowing students to expand their knowledge and apply it in increasingly complicated situations. Students will learn how to design complex high-quality surfaces with industry-standard tools like Rhinoceros. We'll look at the mathematical concepts underlying these surfaces and how they translate into practical design applications. As an extension of surface modeling, we'll look at Grasshopper's possibilities for parametric design. This section will highlight the effectiveness of computational design in tackling complicated design challenges and rapidly iterating through many design possibilities.

	While surface modeling is essential for precision, poly-modeling provides speed and flexibility in the design process using Blender. This module will focus on balancing speed and quality, allowing students to swiftly iterate on design concepts while also refining them for ultimate production. To complete the digital design process, students will acquire advanced rendering and animation skills in Blender and KeyShot. Students will learn how to produce precise renderings and compelling animations that successfully express their design concepts. By the end of the course, students will have developed a comprehensive understanding of advanced 3D CAD techniques and their application in real-world design scenarios. They will be equipped with the skills necessary to tackle complex design challenges and effectively communicate their ideas through digital media.
Specific educational objectives	**Knowledge and understanding** - have acquired one's own work methodology in the field of 3D CAD. This methodology includes the ability to oversee all phases of implementation, from the generation of ideas to the realisation of the finished project. Through the integrated teaching of different subjects, graduates will be able to simultaneously address all these aspects and consider them as synonymous with the development of a project that is successful on a formal and technical level.

Lecturer	Ignacio Merino e-mail Ignacio.MerinoSanchezFayos@unibz.it lecturer's page: Ignacio Merino / Free University of Bozen-Bolzano (unibz.it)
Scientific sector of the lecturer	nn
Teaching language	English
Office hours	Thursday 10:00-11:00
List of topics covered	1. Advanced Surface Modeling (urbs in Rhino) 2. Poly-modeling for rapid 3D-sketching (using Blender) 3. Rendering & Animation (Blender/Keyshot)
Teaching format	The teaching approach will be practical and project-based, reflecting the reality of professional design work. Each lesson will generally include: 1. A quick theoretical introduction to today's topic.

	2. Live presentation of procedures. 3. Guided practice: students apply the concepts to their own projects. 4. Open conversation and problem-solving sessions. Throughout the course, students will collaborate on a semester-long project that incorporates all areas of the curriculum. This project will imitate a real-world design brief, allowing students to see the whole design process from concept to presentation.

Expected learning outcomes	**Disciplinary competence** *Knowledge and understanding* - have acquired the knowledge necessary to realise a project in the field of 3D CAD; - have acquired the basic knowledge necessary for further Master's studies in all components of project culture as well as in technical subjects, with a particular attention to the field of 3D CAD. *Applying knowledge and understanding* - use the basic knowledge acquired in the technical fields to realise a mature project; - make use of the skills acquired during the course of study in the event of continuing studies in a Master's degree programme and to develop them further. **Transversal competence and soft skills** *Making judgements* - Be able to make independent judgements for the purpose of developing their own design skills and in relation to all those decisions that are necessary to bring a project of 3D CAD to completion. *Communication skills* - present an independently realised project in the field of 3D CAD in the form of an installation, orally as well as in writing in a professional manner. *Learning skills* - have learned a work methodology at a professional level - in the sense of being able to identify, develop and realise solutions to complex problems by applying the acquired knowledge in the different fields, with a particular attention to the field of 3D CAD - in order to start a professional activity and/or continue their studies with a master's degree programme; - have developed a creative attitude and learned how to

	enhance it and develop it according to their own inclinations; - have acquired basic knowledge in the field of 3D CAD as well as a study methodology suitable for continuing studies with a Master's degree programme.

Assessment	*By the exam's date, each student must upload on the Microsite of the faculty detailed documentation of the work done during the course.* *Documentation is an integral part of the exam. The documentation must include visual documentation and an abstract of the project.* Student evaluation will be based on: 1. Weekly assignments (30%) 2. Mid-term project (30%) 3. Final project and presentation (40%) The final project will require students to demonstrate mastery of all course elements: advanced surface modeling, efficient poly modeling, and high-quality rendering and animation.
Assessment language	The same as the teaching language
Evaluation criteria and criteria for awarding marks	The final assessment is based on the content of all the exercises according to the following criteria: The evaluation criteria - 100% in total - in Digital Design: 3D CAD Advanced will be divided as follows: A maximum of 20% can be awarded for weekly assignments, personal motivation, and modelling skills acquired and applied by the student during the semester. A maximum of 20% can be awarded for the quality and autonomy of modelling and design work presented by the student in a midterm presentation. A maximum of 60 % can be awarded to the student for the quality and autonomy of the final project and presentation as developed, realised, visualised, argued, documented and communicated during the final exam presentation. The final project will require students to demonstrate mastery of all course elements: advanced surface modelling, efficient poly/modelling, and high-quality rendering and animation.

Required readings	/
Supplementary readings	/