Syllabus

Course Description

Course Title	Digital Design: 3D CAD advanced
Course Code	97097
Course Title Additional	
Scientific-Disciplinary Sector	INFO-01/A
Language	English
Degree Course	Bachelor in Design and Art - Major in Design
Other Degree Courses (Loaned)	
Lecturers	Dott. Ignacio Merino Sanchez-Fayos, Ignacio.MerinoSanchezFayos@unibz.it https://www.unibz.it/en/faculties/design-art/academic-staff/person/40053
Teaching Assistant	
Semester	First semester
Course Year/s	2nd and 3rd
CP	6
Teaching Hours	60
Lab Hours	0
Individual Study Hours	90
Planned Office Hours	18
Contents Summary	The course provides students with advanced knowledge and operational tools for digital design, modelling and 3D visualization.
Course Topics	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 basic animation skills in Blender. 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.
Keywords	3D modeling, advanced, surface, nurbs, digital, cad, poly, rendering, animation,Rhinoceros, Blender, 3D scaning
Recommended Prerequisites	Medium Rhinoceros knowledge Basic Keyshot/similar
Propaedeutic Courses	To have passed the Drawing 3D CAD exam.
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.
Mandatory Attendance	Not compulsory but recommended
Specific Educational Objectives and 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.
Specific Educational Objectives and Learning Outcomes (additional info.)	None
Assessment	By the exam's date, each student must upload on the site 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. N.B. ALL THE STUDENTS ATTENDING THE EXAM AS "OPT" OR AS NON-ATTENDING STUDENTS MUST AGREE UPON THE CONTENTS WITH THE TEACHER.
Evaluation Criteria	The final assessment is based on the content of all the exercises according to the following criteria:

	Attending and Non-attending One final mark: Threshold: 18/30 Relevant for the course will be the ability to think critically and clear communicate the design strategies and processes. Problem solving. Apply complex transformation tasks, move independently between different platforms and topologies, control of highly complex geometries.
Required Readings	None
Supplementary Readings	None
Further Information	None
Sustainable Development Goals (SDGs)	Industry, innovation and infrastructure, Quality education