



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Architettura		
ACADEMIC YEAR	2023/2024		
BACHELOR'S DEGREE (BSC)	DIGITAL TECHNOLOGIES FOR ARCHITECTURE		
INTEGRATED COURSE	PARAMETRIC MODELING AND BIM FOR ARCHITECTURE - LABORATORY		
CODE	23561		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)			
HEAD PROFESSOR(S)	MORENA SARA	Ricercatore a tempo determinato	Univ. di PALERMO
OTHER PROFESSOR(S)	MORENA SARA	Ricercatore a tempo determinato	Univ. di PALERMO
CREDITS	10		
PROPAEDEUTICAL SUBJECTS	18529 - DIGITAL REPRESENTATION STUDIO 23570 - CONSTRUCTION SYSTEMS AND BIM - LABORATORY		
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Mandatory		
EVALUATION	Pass/Fail		
TEACHER OFFICE HOURS	MORENA SARA Tuesday 10:30 13:30 Edificio 14, corpo C, stanza 121, previo appuntamento via mail		

DOCENTE: Prof.ssa SARA MORENA

PREREQUISITES	Basic knowledge of the principles of representation and digital modeling.
LEARNING OUTCOMES	Expected learning outcomes: - Knowledge of the rules and norms that control BIM architectural; - Comprehension of the modeling strategies and tools that best fit the aim of an architectural design; - Ability to use knowledge and comprehension to build the 3D BIM and parametric architectural of a medium-size building; - Autonomous opinion on the interference between modeling tools and design strategies; - Ability to present the outputs of a modeling work and to interact with specialists concurring to the design of a building; - Ability to improve and extend the skills in the subjects of the course and in complementary disciplines.
ASSESSMENT METHODS	The student evaluation starts during the course, noting the interest in the subjects, the ability to apply the acquired knowledge, the independence demonstrated in the application of the topics covered in the classroom tutorials, and in the disposability to interact with the teaching staff. The final evaluation will take into account the work done in the classroom and the material submitted, as well as the ability to demonstrate in mastery of the issues, operational autonomy and management capacity of the applied processes. A special analysis capabilities of instruments and digital techniques used is required and the subsequent synthesis in the determination of the architectural representation process. The final examination consists of an interview and presentation of digital processing. • The oral test consists of an interview, in order to check the disciplinary knowledge provided by the course; The questions, designed to test the learning outcomes, tend to verify: a) the acquired knowledge; With regard to the knowledge assessment, it the ability to establish connections between the content (theories, models, tools, etc.) of the course will be requested. b) the processing capacity; It will verify the ability to provide independent judgments about the disciplinary content; c) the possession of adequate explicative capacity. The student must demonstrate an understanding of the applications within the disciplinary ambit; he must also know how to place the subject content within the professional context. • The evaluation of digital drawings tends to confirm the ability to apply this knowledge. The student must demonstrate the ability to apply their knowledge by developing drawings that have a great capacity for expression, both in technical terms and about the foundational themes of the architectural discipline communication. He must be able to discern which techniques are most suitable to describe the architecture according to the purpose of the communication, distinguishing the executive aspects from those related to multimedia communication. Outcome Excellent 30/30 cum laude: excellent knowledge of the topics, excellent properties of technical language, excellent analytical skills; students demonstrate excellent skills to manage the acquired knowledge and the independence to choose how to obtain a comprehensive process aimed at architectural BIM and parametric modeling. Very good 26/29 Good knowledge of the topics, good properties of technical language, good analytical skills; the student has a good ability to manage the acquired knowledge and demonstrates the independence to choose how to obtain a comprehensive process aimed at architectural BIM and parametric modeling. Good 24/25 Good knowledge of the topics, discrete properties of technical language, discrete analytical capacity; the student has a good ability to manage the knowledge acquired though manifests gaps on how to obtain a comprehensive process aimed at architectural and structural BIM and parametric modeling. Acceptable 21/23 Incomplete knowledge of topics but enough to manage processes, sufficient properties of technical language, discrete analytical capacity; the student shows little ability to manage the acquired knowledge and to determine how to obtain a comprehensive process aimed at architectural BIM and parametric modeling. Sufficient 18/20 Incomplete knowledge of topics, just enough to manage the processes, properties of technical language just enough, limited analytical capacity; the student shows little ability to manage the acquired knowledge and to determine

	how to obtain a comprehensive process aimed at architectural BIM and parametric modeling.
TEACHING METHODS	The teaching activity will consist of both lectures and laboratory sessions. Classroom exercises with assistance will also be included.

MODULE PARAMETRIC MODELING APPLICATIONS	
SUGGESTED BIBLIOGRAPHY	
Tedeschi, A. (2014). AAD Algorithm Aided Design. Le Pensur, Napoli. ISBN 978-88-95315-30-0.	
AMBIT	70265-Altre conoscenze utili per l'inserimento nel mondo del lavoro
INDIVIDUAL STUDY (Hrs)	44
COURSE ACTIVITY (Hrs)	56
EDUCATIONAL OBJECTIVES OF THE MODULE	
The Parametric Modeling Applications module aims to educate students about the principles that govern the approach to parametric modeling. Students will learn the basic concepts of parametric modeling and gain a deep understanding of its applications in the architectural field.	

SYLLABUS

Hrs	Frontal teaching
4	Introduction to parametric modeling
4	Software interface and main components
4	Creation of geometric primitives
4	Introduction to parameters
4	Use of advanced modeling components
4	Creating parametric surfaces
4	Using deformation components
4	Using display and rendering components
4	Data import and export
4	Using data exchange components with BIM design software
Hrs	Practice
16	Parametric modeling for the generation of complex architectural structures

MODULE
BUILDING INFORMATION MODELING APPLICATIONS

Prof.ssa SARA MORENA

SUGGESTED BIBLIOGRAPHY

Anna Osello, Il futuro del disegno con il BIM per ingegneri e architetti, Palermo, 2012, ISBN 978-8857901459.

AMBIT	70265-Altre conoscenze utili per l'inserimento nel mondo del lavoro
INDIVIDUAL STUDY (Hrs)	78
COURSE ACTIVITY (Hrs)	72

EDUCATIONAL OBJECTIVES OF THE MODULE

The course aims at teaching the principles of BIM architectural modeling, the elements of a BIM model, the outputs that can be extracted from a BIM model.

SYLLABUS

Hrs	Frontal teaching
3	Introduction: Modeling methods. Tools and methods Mesh, NURBS and parametric modeling.
3	Architectural design with parametric modeling tools: a gallery of up to date experiences.
3	BIM modeling: its origin and evolution. The most used BIM modeling tool.
4	Principles of BIM modeling: hierarchies of the elements that make a BIM model.
3	Principles of BIM modeling: Level of detail (LOD) and Level of Information (LOI).
3	BIM elements: construction details.
3	Cloud tools for the collaborative management, inspection, visualization and annotation of a BIM model.
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Hrs	Practice
12	BIM modeling of a residential unit.
6	Exercise on the extraction of outputs from a BIM models.
Hrs	Workshops
6	Principles of BIM modeling: upload of an image, a digital drawing, a point cloud. Coordinate reference system.
6	Walls and slabs: upload and customization.
6	Elements of BIM modeling: openings.
6	Elements of BIM modeling: Stairs.
6	BIM elements: Roofs.
4	BIM outputs: schedules
3	BIM outputs: drawings and 3D views.
4	Bim material Library and rendering