

Course syllabi

1. Data on the study programme

1.1 Institution	Technical University of Cluj-Napoca
1.2 Faculty	of Architecture and Urban Planning
1.3 Department	Architecture
1.4 Domain	Architecture
1.5 University level	Licence and master's degree
1.6 Study programme/Qualification	Architecture
1.7 Form of studies	IF – on-site full-time studies
1.8 Course / studio code	70.00

2. Data on the course

2.1 Name of the course	NEW TECHNOLOGIES IN ARCHITECTURE				
2.2 Course/ Studio Head	Associate Professor Paul MUTICĂ				
2.3 Head of seminary/ laboratory/ studio	-				
2.4 Study year	5	2.5 Semester	2	2.6 Type of evaluation	colloquy
2.7 Course /studio regime	Formative category: fundamental (DF)/ linked to the domain (DD)/ specific (DS)/ complementary (DC)				DD
	Compulsory (DI)/ Optional/ (DOp)/ Voluntary (DFac)				DI

3. Total estimated time

3.1 Number of hours/week	2	out of which:	3.2 Course	2	3.3 Seminary	0	3.3 Laboratory	0	3.3 Project	0
3.4 Number of hours/semester	28	out of which:	3.5 Course	28	3.6 Seminary	0	3.6 Laboratory	0	3.6 Project	0
3.7 Distribution of time (hours)/ semester for:										
(a) Individual study supported by course textbook, course text, bibliography, and notes										11
(b) Supplementary study in the library, online, and on site										10
(c) Preparation for seminars/ laboratories/ assignments, reports, portfolios, and essays										0
(d) Tutoring										0
(e) Examination										1
(f) Other activities										0
3.8 Total hours of individual study (sum (3.7(a)...3.7(f)))					22					
3.9 Total semestrial hours (3.4+3.8)					50					
3.10 Number of credits					2					

4. Preconditions (where applicable)

4.1 curriculum preconditions	-
4.2 competence preconditions	-

5. Conditions (where applicable)

5.1. for the course	Course attendance in proportion of 50%, according to the faculty schedule, is a condition for examination. MS Teams platform is also used for sharing documents
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5.2. for the seminary	-
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6. Specific competencies

	<ul style="list-style-type: none"> • Ability to engage imagination, think creatively, innovate and provide design leadership. • Ability to reconcile divergent factors, integrate knowledge and apply skills in the creation of a design solution. • Ability to act with knowledge of historical and cultural precedents in local and world architecture. • Ability to act with knowledge of natural systems and built environments. • Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against the climate • Understanding of the structural design, construction and engineering problems associated with building design. • Understanding of the relationship between people and buildings, and between buildings and their environment, and of the need to relate buildings and the spaces between them to human needs and scale • Understanding the implications of the UN Sustainable Development Goals for architecture education
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7. Objectives of the discipline

7.1 General objective of the discipline	<ul style="list-style-type: none"> • Familiarising students with a minimal background of the latest technological breakthroughs applied in contemporary architecture and construction.
7.2 Specific objectives	<ul style="list-style-type: none"> • Understanding the sustainable dimension in the architecture of recent decades. • Accumulating state-of-the-art technologies, through case studies and innovative construction examples. • Creating premises for research and future trends in the field.

8. Content/Syllabi

8.1 Course	No. of hours	Teaching methods	Notes
C1 Introduction. The importance of new technologies in architecture. Technological progress today	2	Lectures supported by projections, and supporting materials (animations, images, etc.), with discussions on the reader of the course and presentations.	Students are encouraged to engage in talks throughout the course
C2 Principles of sustainability and flexibility of contemporary architecture. Bioclimatic, bionic architecture and biomimicry. Case studies.	2		
C3 Reinterpretations of vernacular architecture in terms of recent technologies: grass roofs, natural ventilation, wind catchers, earth architecture, low-carbon buildings, etc. Contemporary applications.	2		
C4 Special technologies - vertical structures. Skyscrapers. Case studies.	2		
C5-6 Special technologies - structures with extreme openings. Bridges. Multipurpose halls and stadiums. Case studies.	4		
C7 Special technologies - megastructures. Artificial islands, renewable energies and uses in	2		

architecture. Case studies.			
C8 Special technologies - smart homes. BMS. Temporary architecture - challenges. From smart buildings to smart cities. Case studies.	2		
C9 Old materials, new technologies. New uses of wood, concrete, metal and glass. From ventilated facades to kinetic facades. Adaptable architecture. Case Studies	2		
C10-11 Special materials: smart materials, nano-materials, bio-materials, transmateriality. Self-cleaning materials and self-healing materials. Constructive technologies from recyclable materials	4		
C12 Starchitects and the development of new design technologies. CAD, BIM, CAM, CNC. Case Studies	2		
C13 Starchitects and the development of new construction technologies. Foster, Calatrava, Gehry, Hadid, Nouvel, etc.	2		
C14 Presentation by students of their reports and their evaluation during the colloquium.	2		
NOTE: the permanent actualization of the course matter might lead to minor changes in its structure			
<p>Bibliography :</p> <ul style="list-style-type: none"> • Addington, Michelle; Shodek, Daniel, <i>Smart Materials and New Technologies for Architecture and Design Professions</i>, 2005, Oxford: Architectural Press • Almusaed, Amjad, <i>Biophilic and Bioclimatic Architecture</i>, 2011, London: Springer, • Hebel, Dirk E.; Wisniewska, Marta H.; Heisel, Felix, <i>Building From Waste. Recovered Materials in Architecture and Construction</i>. 2014, Basel: Birkhauser • Kretzer, Manuel, <i>Information Materials - Smart Materials for Adaptive Architecture</i>, 2017, Zurich: Springer • Yglesias, Caren, <i>The Innovative Use of Materials in Architecture and Landscape Architecture</i>, 2014, Jefferson NC: McFarland & Company Inc. Publ. <p>A selection of texts can be found in the annex of the course, on the course TEAMS channel.</p>			
8.2 Seminary / laboratory / project	No. of hours	Teaching methods	Notes
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Bibliography			


9. Harmonizing the content of the discipline with the expectations of the epistemic community, the professional associations, and representative employers

Sustainability is a manifold imperative in today's architectural practice. Acquiring knowledge about the latest advances in building technology is bound to open up new perspectives on the potential that architecture brings to contemporary society.

10. Assessment

Type pf activity	10.1 Evaluation criteria	10.2 Assessment method	10.3 Calculation of final grade
10.4 Course	Understanding and exemplifying recent construction technologies	Multiple choice written test - 9 questions of 1p each, plus 1p ex officio. The possibility of relieving the test by	100%

		accumulating up to 2p extra for a report prepared by students and presented during the course	
According to the ECTS/UTCN Regulations, art. 6.4, the Faculty Council has decided that attending courses is compulsory in a percentage of at least 50%. The situation of attendance will be updated weekly on the Teams channel dedicated to the course. Students who have not attended 50% of the courses will not be able to participate in the final exam and will need to recontract the course.			
10.5 Seminary/Laboratory	-	-	-
10.6 Minimal standard for passing			
• a grade of minimum 5			

Date :	Head of course	Title, Name, Surname	Signature
12.12.2023	Course	Assoc. Prof. PhD Arch. Paul MUTICĂ	
	Seminary/Lab	-	-

Date of validation by the Department Council:	Chief of Department Prof. PhD. arch. Virgil POP

Data of approval in the Faculty Council:	Dean Associate professor. PhD. arch. Dragoş Şerban Ion ȚIGĂNAŞ
