Marmara University Faculty of Architecture
School of Architecture and Design
2022-2023 Fall Semester

Course Title	**Code**	**Semester**	**Hour (T+P)**	**Credit**	**ECTS**
Material and Technology III	ARCH 305	5 (Fall)	2+2	3	4
Prerequisities	-				
Language of Instruction	English				
Course Type (Required / elective)	Required				
Course Coordinator	-				
Instructor /e-mail	Assist.Prof.Dr. H. Nur KIZILYAPRAK / nur.kizilyaprak@marmara.edu.tr				
Assistans	Res. Asst. Rumeysa TEMEL				

Goals	Goals of the course are to gain knowledge about designing building elements and components, building construction methods and integration of building elements and components with the remaining sub-systems of the building, and to gain ability to use this theoretical knowledge within a design problem.
Learning Outcomes	• To understand the relationship between the materials uses (steel and timber) and the structural systems and its elements. • To gain abilities on examination of the materials and components that make up the building elements such as stairs and roofs. • To understand different construction techniques and materials of stair systems such as wood, steel and combined stairs. • To gain abilities to design the structural system of a roof. • To gain abilities to produce architectural detail solutions on the building envelope in the context of thermal, acoustic and water related problems.

Course Content	• Concepts of building, building life cycle, durability, service life, sustainability.
	• Introduction to building sub-systems:
	  ○ Space
	  ○ Structural systems
	  ○ Building service systems
	  ○ Building element systems
	• Main principles of designing structural system elements:
	  ○ Steel structures
	  ○ Timber structures
	• Constructional design requirements, performance criteria, resources. Main principles of design and construction of building elements:
	  ○ Floor systems
	  ○ Vertical circulation systems (ramps and stairs)
	  ○ Roof systems (flat and sloping roofs)
	• Examination of all components with drawings and models in 1/50, 1/20, 1/10 and 1/5 scales.

Assessment Criteria	**Assessment Components**	
	Weekly Studies	%10 (before midterm) %10 (before final)
	Mid-term	%30
	Final Exam	%50
	TOTAL	%100

WEEKLY TOPICS AND PREPARATIONS		
Weeks	**Topics**	**Initial Studies**
Week 1 **5.10.2022**	**Lecture:** Introduction & basic concepts of construction technology; vertical circulation system: Stairs & ramps (definitions, classifications, calculation principles)	-
Week 2 **12.10.2022**	**Lecture:** Structural system- Introduction	-
Week 3 **19.10.2022**	**Lecture:** Structural System-Frame System (steel and timber)	-
Week 4 **26.10.2022**	**Studio Work 1:** Structural System- 3D physical Model	-
Week 5 **2.11.2022**	**Studio Work 2:** Structural System- 1/50 Technical Drawings	Structural System- 3D physical Model
Week 6 **9.11.2022**	**Lecture:** Floor systems (Steel and Timber)	Structural System- 1/50 Technical Drawings
Week 7 **16.11.2022**	**Studio Work 3:** Floor systems-3D physical Model + 1/50 Technical Drawings	-
Week 8 **23.11.2022**	**MIDTERM** Content: Design of the structural system and the floor system of the given buildings. (3D physical Model + 1/50 Technical Drawings-plans and sections)	-
Week 9 **30.11.2022**	**Lecture:** Stair systems with different materials (brick, stone, concrete, wood, steel and combined); stair balancing **Lecture:** Stair classifications according to their structures (Directly sits on ground, supported from one side – cantilever, inclined slab, supported by beams)	-
Week 10 **7.12.2022**	**Studio Work 4:** Stair systems-3D physical Model (Reinforced concrete and steel)	-
Week 11 **14.12.2022**	**Studio Work 5:** Stair systems-1/20 Technical drawings (Reinforced concrete and steel)	Stair systems-3D physical Model (Reinforced concrete and steel)
Week 12 **21.12.2022**	**Lecture:** Introduction of roof systems (Definitions and Classifications); Flat roof systems (Analysis, design principles and criteria) **Lecture:** Pitched roof (Definitions, classifications, design principles)	Stair systems-1/20 Technical drawings
Week 13 **28.12.2022**	**Lecture:** Pitched roof (Definitions, classifications, design principles) **Lecture:** Pitched roof (Insulation, ventilation, coatings, tin works)	
Week 14 **4.01.2023**	**Studio Work 6:** Organization of the geometric of a roof system + roof system 3D physical model + details	-
Week 15 **11.01.2023**	**Studio Work 7**: 1/50-Technical drawings of timber roof system (1 plan+2 sections)	Organization of the geometric of a roof system + roof system 3D physical model + details
Week 16	**FINAL**	

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Other References

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ECTS / WORKING HOUR TABLE

Activities	**Number of Weeks**	**Duration (Hour)**	**Working Hours**
Duration of the Course (Including Exams: 14 x Total Weekly Course Hour)	16	4	64
Extracurricular Working Hour (Preparatory Work, Review,Internet studies etc.)	10	2	20
Midterm exam	1	4	4
Homeworks and Presentations	9	4	36
Final Exam	1	4	4
Working Hours in Total			128
Working Hours in Total / 30			4,27
ECTS Credit of the Course			**4**