

Marmara University, Faculty of Architecture and Design
School of Architecture
2024-2025 Fall Semester

Course Title	Code	Semester	Hour (T+P)	Credit	ECTS
Material and Technology III	ARCH 305	5 (Fall)	2+2	3	4
Prerequisites	-				
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	Research Assistant Rumeysa Temel				
Goals	The aim is to provide the student with the foundation to design wood and steel building technologies based on system principles.				
Learning Outcomes	<ol style="list-style-type: none">1. Having knowledge about the materials/components and performance requirements of timber and steel building/construction systems.2. Gaining the ability to analyze the materials/components that make up timber and steel building/construction systems.3. Gaining the ability to apply the knowledge gained for timber and steel building/construction systems.4. Gaining the ability to express the elements that make up timber and steel building/construction systems with 2-dimensional and 3-dimensional architectural communication techniques.5. Gaining the ability to design the joint details based on the performance requirements of the elements that make up the timber and steel building/construction systems.				
Course Content	Material and technology analysis of building systems; timber building construction (timber flooring, walls, and roof), steel building construction (steel flooring, walls, and stairs). Design principles of building element systems. Studio Work - Analysis, synthesis, of timber and steel building systems and and presentation of them using relevant techniques.				
Assessment Criteria	Assessment Components				
	Midterm Evaluation Components Studio Works -%25 Assignment 1 - % 5 Midterm -%10		% 40		
	Final Evaluation Components Assignments - %5 Studio Works -%35 Final Exam - %20		% 60		
	TOTAL		% 100		
Ara sınav başarı notu: - Final başarı notu: 50 Ders başarı notu: 50					

Weekly Topics and Preparations		
Weeks	Topics	Initial Studies
Week 1 01.10.2024	Theoretical Course: Introduction to Timber Structures, Concepts	
Week 2 08.10.2024	Theoretical Course: Timber building construction	
Week 3 15.10.2024	Studio work 1: 1/20 Timber structure design	For studio work details, see page 3. Assignment 1: For assignment details, see page 3
Week 4 22.10.2024	Studio work 2: Drawing of timber floor	For studio work details, see page 3.
Week 5 29.10.2024	NATIONAL HOLIDAY	-
Week 6 05.11.2024	Studio work 3: Drawing of 1/20 scale timber wall construction.	For studio work details, see page 3. The Submission of Assignment 1
Week 7 12.11.2024	Studio work 4: 1/20 Timber roof construction + Seminar , 1/5 detail	For studio work details, see page 3.
Week 8 18.11.2024 24.11.2024	Midterm Exam -	
Week 9 26.11.2024	Theoretical Course: Introduction to Steel Structures, Concepts	
Week 10 03.12.2024	Theoretical Course: Steel Building Construction + Seminar	
Week 11 10.12.2024	Studio work 5: 1/20 Steel Structure Design	For studio work details, see page 3. Assignment 2: For assignment details, see page 3
Week 12 17.12.2024	Studio work 6: 1/20 Steel floor design	For studio work details, see page 3.
Week 13 24.12.2024	Studio work 7: 1/20_Drawing of steel wall construction.	For studio work details, see page 3. The Submission of Assignment 2
Week 14 31.12.2024	Studio work 8: 1/20_Designing of steel stair	For studio work details, see page 3.
Week 15 07.01.2025	Studio work 9: 1/20_Drawing of steel strair, 1/5 Detail	For studio work details, see page 3.
Week 16 13.01.2025 26.01.2025	-Final Exam	

IN-TERM STUDIES

I. REQUIREMENTS FOR STUDIO WORKS

Studio work 1

Draw the schematic plan of the Art Workshop from the studio worksheet, showing the timber structural system plan and both cross-sections in a 1/20 scale.

Studio work 2

Draw the timber flooring plan and a section on the structural system plan and section of the Art Workshop drawn in studio work 1.

Studio work 3

Draw the 1/20 scale plan, section, and view of the timber skeleton exterior wall of the art workshop building specified in the sheet.

Studio work 4

Draw 1/50 scale plan and sections of the timber roof of the art workshop building and 1/5 scale eaves detail.

Studio work 5

Draw the steel structural system plan and the section in both directions of the schematic plan of the art workshop in the application sheet in 1/20 scale.

Studio work 6

Draw the steel flooring plan and section on the carrier system plan and section of the art workshop drawn in Studio Work 1.

Studio work 7

Design the 1/50 scale plan of the steel staircase of the art workshop building.

Studio work 8

Draw a 1/50 scale plan and sections of the steel staircase of the art workshop building and a 1/5 scale detail of the starting point.

Studio work 9

Draw the 1/20 scale plan, section, and view of the steel skeleton exterior wall of the art workshop building.

II. ASSIGNMENTS

Assignment 1

Make a 1/50 scale timber structure physical model of the art workshop building in which you have drawn the structure system, floor, and wall systems and submit it on 05/11/2024.

Assignment 2

Make a 1/50 scale steel structure physical model of the art workshop building in which you have drawn the structure system, floor, and wall systems and submit it on 24/12/2024.

References

ENGLISH REFERENCES:

- Allen, E., Fundamentals of Building Construction: Materials and Methods, 1990.
- Blanc, A., Internal Components, Mitchell's Building Series, London, 1991.
- Ching, F. D. K., Building Construction Illustrated, Van Nostrand R., 1991.
- Chudley, R., Construction Technology, Longman Ltd., 1999.
- Chudley, R., Advanced Construction Technology, Longman Ltd., 1999.
- Diamant, R., Industrialized Building, Liffle, 1968.
- Goetz, K-H, Hoor, D., Moehler, K., Natterer, J., Timber Design and Construction Sourcebook, McGraw-Hill Publishing, 1989.
- Foster, S.J., Structure and Fabric Part I, Part II, Mitchell's Building Series, B.T. Batsford Limited, London, 1986.
- Hardy, S., Roof Design, Mc Graw Hill, 1998.
- Mc Evoy, M., External Components, Mitchell's Building Series, B.T. Batsford Limited, London, 1991.
- Nashed, F., Exterior Wall Design, Mc Graw Hill, 1998.
- Orton, A., The Way We Build Now, Spon Press, 2001.
- Rich, P., Dean, Y., Principles of Element Design, Architectural Press, 1999.
- Smith, Ronald C., Principles and practices of light construction, Prentice-Hall, 1963.

TURKISH REFERENCES:

- Binan, M., Yapı Elemanları, İTÜ Mimarlık Fakültesi, 1975.
- Toydemir, N., Yapı Elemanı Tasarımında Malzeme, Literatür, 2000.
- Yücesoy, L., Temeller, Duvarlar, Döşemeler, YEM Yayın, 1998.

ECTS / WORKING HOUR TABLE			
Activities	Süre (Hafta)	Süre (Saat)	Çalışma Saati
Duration of the Course	14	4	56
Extracurricular Working Hour (Preparatory Work, Review)	15	2	30
Assignments, Studio works	12	3	36
Midterm Exam	1	2	2
Final Exam	1	2	2
Working Hours in Total			126
Working Hours in Total / 30			4.2
ECTS Credit of the Course			4