Course Information					
Course Title	***Code***	***Semester***	***L+P Hour***	***Credits***	***ECTS***
The Computer Integrated Building Process	ARCH 553	Fall	3 + 0	3	7

Prerequisites	-

Language of Instruction	English
Course Level	Master Program
Course Type	Elective
Course Coordinator	Assist. Prof. Dr. Faruk Can Ünal
Instructors	Assist. Prof. Dr. Faruk Can Ünal
Assistants	
Goals	In the development and the realisation of design, it is aimed to understand the methods and techniques related to benefit from the computer integrated building processes.
Content	The process from the digitally designed product to the manufacture with digital fabrication is covered in the course. The content of the course focuses on sectioning, tessellating, folding, contouring and moulding techniques based on additive, subtractive and formative methods.

Learning Outcomes	**Program Learning Outcomes**	**Teaching Methods**	**Assessment Methods**
Knowledge in digital fabrication	1, 3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 17	1, 2, 3, 4, 5, 6	A, C
Pertaining to the relevant disciplines	1, 3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 17	1, 2, 3, 4, 5, 6	A, C
Ability to use theoretical and applied knowledge in digital fabrication	1, 3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 17	1, 2, 3, 4, 5, 6	A, C

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Discussion, 4: Seminar, 5: Project, 6: Teamwork; 7: Technical excursion

Assessment Methods:	A: Testing, B: Jury, C: Homework, D: Quiz

COURSE CONTENT

Week	Topics	Study Materials
1	Introduction to manufacturing from digital design	
2	Sectioning in building process	
3	Tessellating in building process	
4	Folding in building process	
5	Contouring in building process	
6	Forming in building process	
7	Student Research Presentations	
8	Introduction to Rhino / Grasshopper	
9	Rhino / Grasshopper Applications	
10	Mid Term Exam	
11	Student Projects	
12	Student Projects	
13	Student Projects	
14	Student Projects	

RECOMMENDED SOURCES

Textbook	Iwamoto, L. (2013). Digital fabrications: architectural and material techniques. Princeton Architectural Press.
Additional Resources	Sakamoto, T. (Ed.). (2008). From control to design: parametric/algorithmic architecture. Actar-D. Gramazio, F., & Kohler, M. (2014). Made by robots: challenging architecture at a larger scale. John Wiley & Sons. Williams, K. (Ed.). (2012). Digital Fabrication. In Digital Fabrication. Birkhäuser, Basel. Schneider, C. (2018). Opening digital fabrication: transforming TechKnowledgies. KIT Scientific Publishing. Stacey, M. (Ed.). (2004). Digital Fabricators. Architects' Journal, 219(15). Dunn, N. (2012). Digital fabrication in architecture. Laurence King. Glynn, R., & Sheil, B. (Eds.). (2017). Fabricate 2011: Making Digital Architecture (Vol. 1). UCL Press.

	Willmann, J., Block, P., Hutter, M., Byrne, K., & Schork, T. (Eds.). (2018). Robotic Fabrication in Architecture, Art and Design 2018: Foreword by Sigrid Brell-Çokcan and Johannes Braumann, Association for Robots in Architecture. Springer. Caneparo, L., & Cerrato, A. (2014). Digital fabrication in architecture, engineering and construction. Springer Netherlands. Legendre, G. (2011). Mathematics of space. John Wiley & Sons. Hwang, I. (2006). Verb natures. Actar. Kolarevic, B. (Ed.). (2004). Architecture in the digital age: design and manufacturing. taylor & Francis.

MATERIAL SHARING	
Documents	Presentations
Documents	Presentations
Exams	Mid-term, Final

ASSESSMENT

IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Mid-terms	1	30
Quizzes		
Project		
Seminar and presentation	1	30
Assignment		
Final	1	40
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		60
Total		**100**

COURSE CATEGORY	Expertise/Field Courses

COURSE'S CONTRIBUTION TO PROGRAM

No	Program Learning Outcomes	Contribution				
		1	2	3	4	5

1	Acquires knowledge of and comprehends socio-economic and spatial elements, and processes which necessitates urban design and also involves outputs of design projects.					
2	Has the competence for producing a comprehensive architectural project from the beginning of schematic design to detailed system development phase (structural and environmental systems, safety and fire protection, partition systems, building envelop, building service systems).					
3	Has the ability to employ the experience gained from architectural building to new fields and generate strategies.			x		
4	Has the knowledge of approaches, models and techniques which will improve the efficiency in managerial tasks and management of a architectural project and construction.			x		
5	Has the knowledge of principles of the modern load-bearing systems and application methods.					
6	Has the ability to transfer and apply architectural knowledge to design and application processes.					
7	Has the ability to employ theoretical and practical field-related knowledge with reference to their undergraduate competence.			x		
8	Has the ability to conduct research, evaluate, make critical analysis, employ appropriate techniques and reach unique results.					
9	Has the competence of relating to project and construction processes, analyzing and evaluating within the framework of architectural structure.			x		
10	Has the competence of taking strategic decisions of an architectural project and generating unique architectural solutions.			x		
11	Has the competence of systematically presenting a work- carried out individually or as a group work- visually, orally and in written by employing required computer programs.					
12	Has the knowledge of relation of urban design with architecture and other fields of expertise.					
13	Has the ability to prepare urban design project and/ or research by employing his/her knowledge and generating new methods and ideas.					
14	Has the ability to include socio-economic and spatial criteria into design process.			x		
15	Has the ability to conduct research, acquire knowledge, make analysis and synthesis, and use those for unique outputs.					
16	Has the competence of managing a project in urban design field individually.					
17	Has the competence of conducting a unique academic/ scientific study, presenting it and discussing it on a dialectic basis.					x

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Including the exam week: 14 x Total course hours)	14	3	42

Hours for off-the-classroom study (Pre-study, practice)	19	4	116
Mid-terms	1	1	1
Quizzes			
Project	2	3	6
Seminar and presentation	1	1	1
Assignment			
Final examination	1	1	1
Total Work Load			167
Total Work Load / 25			6.68
ECTS Credit of the Course			7