ESOGU INDUSTRIAL DESIGN DEPARTMENT

COURSE INFORMATION FORM

Course Name	Course Code
Material and Manufacturing Techniques I	141113007

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
3	2	0	2	3

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	1	2		

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite(s) if any	-
Objectives of the Course	The aim of this course is to learn the ways of choosing various materials in a new product, to be able to define which material properties have priority in different product parts or products, and to learn some functional and aesthetic qualities of different materials.
Short Course Content	Within the scope of this course, it is aimed to provide students with the ability to select materials in the projects, by giving them the knowledge of material selection, processing and production methods. It follows the way of presentation and expression by associating it with existing products in order to help settle the material information for industrial product design. Within the scope of the course, the functional and aesthetic properties of materials such as polymer, wood, smart materials and biomaterials are taught.

Learning Outcomes of the Course		Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Comprehends the materials in general terms.	2, 5, 7	1, 5, 7	A, B
2	Gain the skills to see the usage areas of materials and to understand related production techniques.	2, 5, 7	1, 5, 7, 9	A, B
3	Comprehends its place in industrial design by learning in detail the production techniques suitable for polymer, wood, smart materials and biomaterials.	2, 5, 7	1, 5, 7, 9	A, B
4	Gains information about materials and manufacturing methods based on interdisciplinary interaction.	2, 5, 7	1, 5, 7	A, B
5				
6				
7				
8				

***Teaching Methods** **1:**Expression, 2**:**Discussion, **3:**Experiment, **4:**Simulation, **5:**Question-Answer, **6:**Tutorial, **7**:Observation, **8**:Case Study, **9:**Technical Visit, **10:**Trouble/Problem Solving, **11:**Induvidual Work, **12**:Team/Group Work, **13**:Brain Storm, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation

****Measuring Methods** **A:**Exam, **B:**Quiz, **C:**Oral Exam, **D:**Homework, **E:**Report, **F:**Article Examination, **G:**Presentation, **I:**Experimental Skill, **J:**Project Observation, **K**:Class Attendance; **L**:Jury Exam

Main Textbook	- Fındık, F. (2016). Malzeme ve Tasarım-Tasarım-Malzeme seçimi-Uygulama, Seçkin Yayınevi, Ankara. - Van Vlack,L. (1990). Malzeme Bilimine Giriş, Birsen Yayınevi. - Kıralp, S., Özkoç, G., Erdoğan, S., Çamurlu, P., Baydemir, T., Doğan, M., Plastikler, ODTÜ Yayıncılık, Ankara. - Smith, W. F. (2001). Malzeme Bilimi ve Mühendisliği, Çev. Kınıkoğlu, N. G., Literatür Yayıncılık, İstanbul.
Supporting References	- Ezdeşir, A., Erbay, E. (1999). Polimerler-I, Pagev yayınları. - Akyüz, Ö. F. (2001). Plastikler ve Plastik Enjeksiyon Teknolojisine Giriş, Pagev Yayınları.
Necessary Course Material	

Course Schedule	
1	Material information
2	Material selection and classification of materials in design
3	Structure-material-production relationship in design & General properties of materials
4	Structure and properties of polymer materials (General properties of polymer materials)
5	Structure and properties of polymer materials (Thermoplastics)
6	Structure and properties of polymer materials (Thermosets, Elastomers)
7	Processing methods of polymer materials (Extrusion, Injection)
8	Mid-Term Exam
9	Processing methods of polymer materials (Blow molding, rotational molding, thermoforming, casting)
10	Other processing methods in polymer materials
11	Structure and properties of wood materials
12	Processing methods of wood materials
13	Materials and production methods used in furniture production
14	Smart materials and Biomaterials
15	Safety rules and equipment used in the material and model atelier
16,17	Final Exam

Calculation of Course Workload			
Activities	**Number**	**Time (Hour)**	**Total Workload (Hour)**
Course Time (number of course hours per week)	14	2	28
Classroom Studying Time (review, reinforcing, prestudy,….)			
Homework			
Quiz Exam	2	1	2
Studying for Quiz Exam	8	3	24
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	3	3	9
Final Exam	1	2	2
Studying for Final Exam	3	3	9
		Total workload	**76**
		Total workload / 30	**2,53**
		Course ECTS Credit	**3**

Evaluation	
Activity Type	**%**
Mid-term	30
Quiz	30
Final Exam	40
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	**PROGRAM OUTCOME**	**Contribution**
1	Within cultural, historical and artistic context the ability to integrate theoretical knowledge about production and consumption mechanisms into the design practice;	1
2	The ability to plan the design process, to choose and use appropriate methods and techniques;	3
3	The ability to identify design problems and related sub-problems and to produce creative solutions with a critical and dialectical approach;	1
4	The ability to design in terms of spatial thinking using design principles and elements;	1
5	The ability to make applications in the interaction of aesthetics and function using design elements and means and to evaluate these applications;	3
6	The ability to visualize and present using two and three dimensional design tools;	1
7	The ability to follow and apply technological developments, current design approaches, sustainable production methods, materials and innovations in the field of informatics in design projects;	5
8	The ability to use field knowledge in industrial design projects by considering the needs and interests of the society and target users within the scope of environmental awareness, professional ethics and the laws;	1
9	The ability to carry out the design process effectively individually or in a team;	1
10	The ability to take an active role in discipline-specific or interdisciplinary studies at the national and international levels.	1

LECTUTER(S)				
Prepared by	Assoc. Prof. Dr. Cemil YAVUZ			
Signature(s)				

Date:08.08.2024