ESOGU INDUSTRIAL DESIGN DEPARTMENT

COURSE INFORMATION FORM

Course Name	Course Code
Material and Manufacturing Techniques II	141114007

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
4	1	1	2	3

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

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

Prerequisite(s) if any	-
Objectives of the Course	The aim of this course is to gain basic concepts about materials and production techniques used in design processes based on industrial production. The aim of this course is to reflect the knowledge of metal, glass, ceramic, composite materials and production methods of the material given during the term into practice.
Short Course Content	This course covers drawing a general framework about the materials used in product design and giving basic information about the material. Giving the relations between the properties of these materials and their production methods in detail, explaining the production techniques related to metal, glass, ceramic and composite materials, supporting the information given with technical trips to be organized related to the subject, etc. topics are discussed.

	Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Have detailed information about metal, glass, ceramic and composite materials.	2, 5, 7	1, 5, 7	A, B
2	By learning the properties, usage areas and related production techniques of these materials in detail, they understand their place in industrial design.	2, 5, 7	1, 5, 7, 9	A, B
3	Understands materials and related manufacturing methods practically based on interdisciplinary interaction.	2, 5, 7, 9	1, 5, 6, 7	A, B, J
4	Selects the right material and production method during the design process.	2, 5, 6, 7	6, 7, 10, 14	A, B, J
5	Students gain the ability to make models with the material knowledge they have learned.	2, 5, 6, 7	6, 10, 14	A, B, J
6	Learn the production technique suitable for the material.	2, 5, 6, 7	6, 10, 14	A, B
7	Learn the differences in time, quantity and cost between production techniques.	2, 5, 7, 9	7, 9	A, B
8	Learn the relationship between the production method and the product.	2, 5, 7, 9	6, 9, 14	A, B, J
9				
10				

***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. - Onaran, K. (2003). Malzeme Bilimi, Bilim Teknik Yayınevi. - Smith, W. F. (2001). Malzeme Bilimi ve Mühendisliği, Çev. Kınıkoğlu, N. G., Literatür Yayıncılık, İstanbul. - Metal Meslek Bilgisi, M.E.B. Yayınları, Ajans Türk Yayıncılık,1995. - Canbulat, M. T., Özkaraman Şen, M. (2014). Metal Mobilya Tasarım ve Üretim İlkeleri, Mimar Sinan Güzel Sanatlar Üniversitesi Yayınları, İstanbul. - Canbulat, M. T. (2011). Tasarımcılar için Metal Şekillendirme Yöntemleri, Birsen Yayınevi, İstanbul.
Supporting References	- Lesko, J. (2008). Industrial design: Materials and manufacturing guide. Wiley.com.
Necessary Course Material	

Course Schedule	
1	Material use and selection
2	Material and design relationship
3	Mechanical properties in industrial materials
4	Structure and properties of metal materials
5	Forming methods in metal materials: Plastic forming
6	Forming methods in metal materials: Machining
7	Forming methods in metal materials: Joining-Additive
8	Mid-Term Exam
9	Forming methods in metal materials: Casting
10	Powder Metallurgy
11	Structure and properties of glass materials
12	Structure and properties of ceramic materials
13	Forming methods in ceramic materials
14	Composite materials, Corian, Elastomers, Colloidal materials
15	Forming methods in composite materials
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)	1	10	10
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	**86**
		Total workload / 30	**2,86**
		Course ECTS Credit	**3**

Evaluation	
Activity Type	**%**
Mid-term	25
Quiz	30
Project	15
Final Exam	30
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;	3
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;	3
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