COURSE SYLLABUS						
Course Title	**Course Code**	**Semester**	**Course Hour/Week**		**Credit**	**ECTS**
Sustainability for Industrial Design	INDD208	2	**Theory** 3	**Practice** 0	3	5
Course Type	**Compulsory Courses**	**Department Elective**	**Faculty Elective**	**University Elective**	**CoHE (YÖK) Compulsory**	**Other**
	x					
Level of Course	**Associate Degree (Short Cycle)**		**Undergraduate (First Cycle)**		**Graduate / Doctoral (Second / Third Cycle)**	
			X			

Language of Instruction	English

Course Instructor(s)	Instr. Mojtaba Karimnezhad	E-mail : mojtaba.nezhad@arucad.edu.tr Office:
Course Objectives	During the course, the students will learn more about Sustainable Design Cycles, Systems Thinking, Design for Disassembling, Circular Economy. Students should learn about Redeuce/Reuse/Repair/Recycle principles.	

	Students To Do:	**Teaching Methods**	**Evaluation Methods**
Course Learning Outcomes	Obtain experience with sustainable design, upcycling, and Circular Economy.	Lectures, case studies, studio exercises, group discussions	Project submissions, research documentation, presentations
	Develop a deeper knowledge of sustainable	Materials workshops, lab demonstrations, guided research	Material analysis reports, prototype evaluation, quizzes

	materials and recycling processes.		
	Understand the differences between sustainable materials, sustainable processes, and sustainable final products.	Lectures, group analysis, design critique sessions	Written reflections, design journals, midterm project assessment
	Learn how to design for a sustainable world, integrating systems thinking and circular design principles.	Studio exercises, iterative project development, tutorials	Final project evaluation, presentation boards, portfolio review
Course Content	This course provides students with an opportunity to familiarize with concepts such as: Regenerative Design, Design Innovation, Waste Minimization, Resource Replenishment, Resource Efficiency Design for Climate Policy, Product Life Cycle, Circular Economy, Cradle to cradle and Biomimicry, Design-Led Innovation, Sustainable Development Goals (SDG).		

COURSE OUTLINE/SCHEDULE

Week	Topic	Implementation (theory/practice)	Required Reading, Preliminary preparation
1	Introduction to Sustainable Product Design & Course Overview.	T	Review course brief and sustainability basics.
2	Systems Thinking in Sustainable Design.	T	Read case studies on system-level design.
3	Design for Circular Economy: Reduce/Reuse/Repair/Recycle.	T	Review circular economy principles and examples.
4	Life Cycle Assessment (LCA).	T	Study LCA methodology and product examples.
5	Sustainable Materials & Smart Materials.	T	Research bio-based and responsive materials.

6	Biomimicry & Nature-Inspired Design.	T	Explore biomimetic case studies and inspirations
7	Eco-Innovation & Design-Led Sustainability.	T	Study innovative sustainable products.
8	Midterm Wrap-Up / Quiz / Reflection.	T	Prepare notes and questions for midterm.
9	Term Project Introduction: Product Redesign or Recycle.	T	Select an existing product and research sustainability issues.
10	Project Research & Problem Identification.	T	Analyze material, process, and lifecycle of selected product.
11	Ideation & Concept Sketches.	T	Develop redesign ideas with sustainability focus.
12	Prototype Development.	T	Build physical or digital prototype of redesign.
13	Prototype Refinement and Documentation.	T	Refine prototype, prepare sketches, and short report.
14	Prototype Refinement and Documentation.	T	Refine prototype, prepare sketches, and short report.
15	Final Critique.	T	Submit project, prototype, sketches, and sustainability report.
16	Final Critique.	T	Submit project, prototype, sketches, and sustainability report.
17	**FINAL EXAM**		

Required Course Material(s) / Reading(s)/ Text Book(s)	• Proctor, R. (2015). *The sustainable design book*. Laurence King Publishing. Call number: NK1520 .P76 2015

	• Walker, S. (2014). *Designing sustainability*. Routledge. Call Number: TS171.4.W349 2014
Recommended Course Material(s)/ Reading(s) /Other	• Chick, A., & Micklethwaite, P. (2011). *Design for sustainable change: How design and designers can drive the sustainability agenda*. AVA Publishing. ISBN: 978-2940411306 • Liden, D. (2024). *Better things: Materials for sustainable product design*. Laurence King Publishing. ISBN: 978-1529419689 • McDonough, W., & Braungart, M. (2013). *The upcycle: Beyond sustainability—designing for abundance.* North Point Press. ISBN: 978-0865477483

ASSESSMENT		
Learning Activities	**NUMBER**	**WEIGHT in %**
Mid-Term	1	40
Quiz		
Assignment		
Project		
Field Study		
Presentation / Seminar		
Studio Practice		
Other		
Contribution of Final Examination/Final Project/ Dissertation to the Final Grade	1	60
TOTAL	2	100

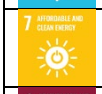
Industrial Design Programme + LO

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME LEARNING OUTCOMES							
No	**PROGRAMME LEARNING OUTCOMES**	Level of Contribution (1-lowest/ 5-highest)				
		1	2	3	4	5
1	Understand knowledge of industrial design principles, design methodologies, history, aesthetics, form & function and product development processes.					x
2	Explain the properties of materials, manufacturing technologies, and production methods used in industrial product design.					x
3	Understand ergonomics, and user-centered design concepts in product development.				x	
4	Understand sustainability principles, environmental impacts, and life-cycle considerations in industrial design.			x		
5	Analyze design problems, user needs, and market requirements to develop appropriate product design solutions.					x
6	Generate creative product concepts using sketching, ideation techniques, and visual exploration methods.				x	
7	Develop product designs using digital tools, 3D modeling, and rendering software.					x
8	Develop prototypes or models to evaluate product functionality, usability, and aesthetics.				x	
9	Communicate design ideas effectively through sketches, technical drawings, models, and professional presentations.			x		
10	Work effectively in multidisciplinary teams during product design and development processes.			x		
11	Manage design projects considering production constraints, market needs, and economic feasibility.			x		
12	Demonstrate professional responsibility, ethical awareness, and commitment to sustainable design practices.				x	

ECTS / STUDENT WORKLOAD				
ACTIVITIES	**NUMBER**	**UNIT**	**HOUR**	**TOTAL (WORKLOAD)**
Course Teaching Hour (X weeks * total course hours)	16	1	4	64
Preliminary Preparation and self- study	1	1	6	6
Mid-Term	1	1	25	25
Final Examination/ Final Project/ Dissertation	1	1	30	30
Other				
TOTAL WORKLOAD				125
TOTAL WORKLOAD / 25				5
ECTS				**5**

ETHICAL RULES WITH REGARD TO THE COURSE
Plagiarism Disclaimer Detected and undetected plagiarism is a serious offense at any time and it could have devastating effects on your degree result and future professional lives. Plagiarism is easy to avoid if you make sure to identify and acknowledge your sources thoroughly and do not copy directly from visual examples, designs, or notes that have in turn been taken word for word from your sources.

	SDG 1: No Poverty	
	SDG 2: Zero Hunger	
	SDG 3: Good Health and Well-Being	x
	SDG 4: Quality Education	x
	SDG 5: Gender Equality	x

	SDG 6: Clean Water and Sanitation	x
	SDG 7: Affordable and Clean Energy	x
	SDG 8: Decent Work and Economic Growth	x
	SDG 9: Industry, Innovation and Infrastructure	x
	SDG 10: Reduced Inequalities	x
	SDG 11: Sustainable Cities and Communities	x
	SDG 12: Responsible Consumption and Production	x
	SDG 13: Climate Action	x
	SDG 14: Life Below Water	
	SDG 15: Life on Land	x
	SDG 16: Peace, Justice and Strong Institutions	
	SDG 17: Partnership for the Goals	x

ASSESSMENT DETAILS AND EVALUATION CRITERIA:	
Final grades will be determined based on the course learning activities and the assessment details for the final examination or project, as outlined below, in accordance with the University's Education and Examination Regulations. Students are required to attend at least 70% of the classes. The maximum allowable absenteeism is 30%. Midterm: 40% Final: 60%	
PREPARED BY	Instr. Mojtaba Karimnezhad.
UPDATED	March 2026.
APPROVED	