2. Industrial Design

GENERAL INFORMATION ABOUT THE COURSE		
Course coordinator	Tomislav Veliki, PhD, Assistant Professor	
Course name	Industrial design	
Study program	**Mechanical Engineering**	
Course status	Compulsory / elective	
Year	1	
Semester	1	
Number of credits and teaching methods	ECTS student load coefficient	4
	Number of hours (lectures + seminars + exercises)	30+15+0

1. DESCRIPTION OF THE COURSE

1.1. Course objectives

Adopting fundamental design concepts and methodologies in product development with the aim of optimizing product usability, form and appearance, for the mutual benefit to the user and manufacturer. The course leads to acquiring knowledge of the fundamentals, methods and technologies in designing industrial products. Product development is treated from market research and concepts, weighing ergonomic and economic features to achieving the final product.

1.2. Course enrolment prerequisites *(if applicable)*

None

1.3. Expected course learning outcomes

1. Explain the process in designing industrial products occurring through a series successive phases and select beforehand the optimal solution using a defined methodology.
2. Collect and address user requirements for developing a technical system. Compare existing solutions on the market.
3. Define requirements for an industrial product and generate an algorithm based upon which the requirements are evaluated and priorities defined.
4. Define product specifications from the requirements sheet (ideal, threshold/limit, final).
5. Generate a matrix of the conceptual design for the technical system based on non-technical (aesthetic, ergonomic) and technical (technology, materials, price), select the appropriate concept.
6. Improve the selected concept in terms of industrial design and preparation for production.

7. Detect the phases of prototyping from the actual concept.

1.4. Course content

1. Introduction to the course, historical development of industrial design
2. Product aesthetics
3. Ergonomics. Forming theory
4. Process and organisation of product development
5. Product planning
6. User requirements
7. Organising user requirements
8. Product specifications
9. Setting the final specifications
10. Generating the concept
11. Selecting the concept
12. Product architecture
13. Industrial design process
14. Design for production
15. Prototypes in the product development process

1.5. Types of teaching	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☒ Distance learning ☒ Field work	☒ Autonomous exercises ☒ Multimedia and network ☐ Laboratory ☒ Mentor assistance ☒ Other types
1.6. Comments		

1.7. Student obligations *(attendance at classes, lectures, tutorials, seminars)*

- Active participation in classes and online activities.
- Investigating scientific and professional literature (books, thematic articles, etc.).
- Analytical evaluation of professional texts and synthesising knowledge with the aim of preparing the seminar paper and presenting it.
- Filling out periodical online forms for reports on achieved tasks and obligations.
- Autonomously register the topic of the seminar paper.
- Prepare and present the seminar paper.
- Participation in evaluation of seminar papers in accordance with instructions on the online website for the course
- Edit, supplement and correct the seminar paper based on reviews.
- Fill out the online form for final self-assessment.

1.8. Tracking student work (proportion of individual activities in terms of ECTS credits based on the total number of ECTS credits)

Class attendance	1.5	Class participation		Seminar paper	1	Experimental work	0.5
Written exam	0.5	Oral exam		Essay		Research	0.5
Project		Continual assessment of knowledge		Written seminar paper		Practical work	
Online activity							

1.9. Grading and assessment of student work during the semester and for the final exam *(interim exam, written exam, oral exam)*

Presentation of the final seminar

1.10. **Mandatory literature** (relevant at the time of submitting the proposed study program)

- Thomas Ask, Engineering for Industrial Designers and Inventors, O'Reilly Media, 2016.

1.11. Supplementary literature (relevant at the time of submitting the proposed study program)

- Otto, K. N., Wood, K. L.: Product Design – Techniques in Reverse Engineering and New Product Development; Prentice Hall, 2001.
- Ulrich, K. T., Eppinger, S.D.: Product Design and Development; McGraw-Hill; 2004.
- Otto, K. N., Wood K. L., Product Design, Prentice Hall, New York, 2001.

1.12. Manner of tracking quality to ensure the acquisition of exit knowledge, skills and competences

2. COMBINING THE LEARNING OUTCOMES, TEACHING METHODS AND ASSESSMENT OF THE LEARNING OUTCOMES

2.1. Class participation	*2.2. Student participation*	*2.3. Learning outcome*	*2.4. Assessment method*
Lectures	Actively following, analysis of professional articles	1-7	Participation in classroom activities (10%)
Seminar paper	Searching the literature, selecting and explaining the seminar paper topic, writing the seminar paper, presenting the seminar paper	1-7	Submitted and presenting the seminar paper in front of all students (90%)