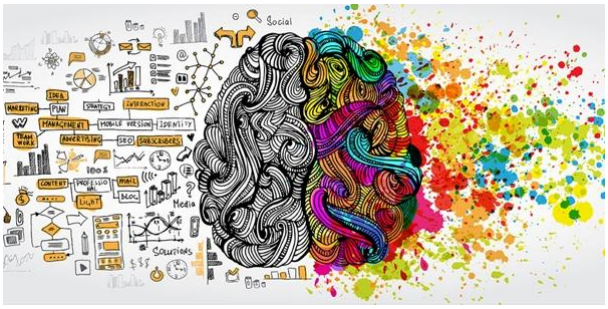
Національний технічний університет України
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ
імені ІГОРЯ СІКОРСЬКОГО»

Department of Applied Radio Electronics

[RE-43] INDUSTRIAL DESIGN



Curriculum of the academic discipline (Syllabus)

Course details

Level of higher education	First (bachelor's)
Field of knowledge	G - Engineering, manufacturing, and construction
Specialty	G5 - Electronics, electronic communications, instrument engineering, and radio engineering
Educational program	All
Discipline status	Elective (F-catalog)
Form of higher education	Full-time
Year of training, semester	Available for selection starting from the 4th year, spring semester
Scope of the discipline	4 credits (Lectures 16 hours, Practical classes 30 hours, Laboratory work 74 hours)
Semester Control/control measures	Credit
Class schedule	https://schedule.kpi.ua
Language of instruction	Ukrainian
Information about the course coordinator/teacher s	Lecturer: Zinger Y. L., Lab: Zinger Y. L., Independent work: Zinger Y. L.
Course placement	https://classroom.google.com/c/NTc4MzE0ODkxNzQx?cjc=wioclxc

Curriculum

1. Description of the course, its purpose, subject matter, and learning outcomes

Industrial design combines engineering and creative components, product concept development, and all stages of product development, from idea to production.

Every object you interact with every day in your home, office, university, or public spaces is the result of a design process during which thousands of decisions were made by an industrial designer (and their team) aimed at improving your life through well-designed construction.

Knowledge and understanding of industrial design make it possible to develop the most user-friendly device for our users.

2. Prerequisites and post-requisites of the discipline (place in the structural-logical scheme of training under the relevant educational program)

Students must be able to work in SolidWorks (discipline "Three-dimensional modeling of

REA"). Have an understanding of production and technological processes.

3. Content of the discipline

The content of the discipline is presented in a tandem of lectures and practical classes, since the lecture material is inextricably linked to the tasks and topics of the practical classes.

Topic 1. Introduction to industrial design.

- Introduction. What is industrial design?
- Choosing a topic for the discipline. Justifying the need for your device.

Topic 2. Ergonomics in industrial design.

- Ergonomics.
- Preliminary proposal. Selection and justification of the best design option. • Ergonomic systems.
- Modeling the device body in a 3D modeling software environment (SolidWorks). • Design evolution and common design mistakes.
- Rendering.

Topic 3. Instructions (user manual).

- What is a device instruction (user manual)?
- Developing the structure of device instructions.
- Review and discussion of examples and errors in instructions. • Developing instructions for a device and testing them

Topic 4. How to generate interest in your development?

- Rules for presenting your project to potential investors/users
- Developing and creating a customer-oriented presentation of your product. • Presentation of your development.

4. Training materials and resources

All literature is available on GoogleDrive at: https://cutt.ly/BjRqkr0. For topics 1 and 2:

1. Donald A. Norman. The Design of Everyday Things / Donald A. Norman. - Book Club "Family Leisure Club", 2019. – 320 p. – 978-617-12-4760-4.

2. Papanek, V. Design for the Real World: Human Ecology and Social Change / Victor Papanek, 2020. – 480 p. – ISBN 978-617-7799-34-3.

3. Siemka, S. Ergonomics and Ergodesign / Serhiy Siemka. – Lira-K, 2019. – 616 p. – 978-617-7799-34-3.

Related to Topic 3:

1. How to Build the Best User Documentation [Electronic resource]. - Access mode: https://www.techsmith.com/blog/user-documentation/
2. Ultimate Guide to write instruction for User Manual [Electronic resource] - Access to the resource: https://document360.com/blog/creating-a-user-manual/
3. The best user manuals EVER [Electronic resource] – Access mode: https://headrush.typepad.com/creating_passionate_users/2007/03/the_best_user_t.html.

4. How to Create a User Manual that Your Users Will Love? [Electronic resource] - Access mode: https://www.thecloudtutorial.com/how-to-create-a-user-manual/

5. 40 Free Instruction Manual Templates [Operation / User Manual] [Electronic resource] - Access mode: https://templatelab.com/instruction-manual-templates/

Related to Topic 4:

1. How to Make a Presentation Interesting (And NOT Boring!) [Electronic resource] - Access mode: https://www.techsmith.com/blog/powerpoint-presentation-not-boring/
2. Krystina Martinez. The best presentation software in 2020 [Electronic resource] / Krystina Martinez. – 2020. – Access mode: https://zapier.com/blog/best-powerpoint-alternatives/.
3. How to Give a Killer Presentation [Electronic resource] / Chris Anderson. - 2013. - Access to the resource: https://hbr.org/2013/06/how-to-give-a-killer-presentation

Educational content

5. Methodology for mastering the academic discipline (educational component)

Lecture material is required to complete each practical assignment. The entire course is divided into four topics, and all lectures and practical assignments are divided as follows and presented in the table below:

<table>
<tr><td>Practical work
Lecture</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr>
<tr><td>1</td><td>Topic 1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td colspan="4" rowspan="4">Topic 2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td colspan="2" rowspan="2">Topic 3</td><td></td><td></td></tr>
<tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2" rowspan="2">Topic 4</td></tr>
<tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Topic 1. Introduction to industrial design.

Aimed at familiarizing students with the concept and basics of industrial design. Why industrial design is inextricably linked to the development of modern devices. Choosing a topic (device) for work during the semester.

Topic 2. Ergonomics in industrial design.

Study of the concept of ergonomics. Basic criteria and laws of ergonomics. Study of the concept of ergonomic systems. Determining the difference between ergonomics and ergonomics.

Based on the laws of ergonomics, simulate a device that will have an intuitive interface. Upon completion of the topic, students must submit a collection of renders in SolidWorks (or other software, as agreed with the instructor) for review.

Topic 3. Instructions (user manual).

Study the features of developing instructions for a device (user manual). Identify the main sections that the instructions should contain. Develop instructions and test *them on* a focus group of classmates. Upon completion of the topic, students must submit instructions for their device (topic) in *.pdf format.

Topic 4. How to generate interest in your development?

Learning the basic principles of developing a customer-oriented presentation. Reviewing software/services for creating presentations. Upon completion of the topic, students must submit and defend a presentation for their device (topic).

Upon completion of all topics, the course program includes a modular test.

6. Independent work

Independent work by students includes submitting the following types of work to the instructor for review (within the deadlines specified by the instructor):

1. A collection of device (topic) renders in SolidWorks (or other software, as agreed with the instructor).
2. Instructions for your device (topics) in *.pdf format.
3. Presentation of the device (topic).

The course program includes a calculation and graphic assignment. This involves completing all three of the above course assignments and defending them.

Policy and control

7. Academic discipline (educational component) policy

- At the beginning of the semester, a Telegram chat for the discipline is created for quick interaction between students and teachers. All students in the group must be present in the chat;
- Attendance at practical classes and lectures is mandatory.
- All assignments must be submitted to the instructor for review by the specified deadlines. Late submissions will result in a deduction of 3 points for each assignment and the loss of the right to redo the work to improve the score.
- If the teacher has questions about the authorship of the work submitted by the student, the teacher has the right to conduct an additional defense of the work.
- Incentive points are awarded for student activity in practical classes.

8. Types of control and rating system for assessing learning outcomes

For each task, the following maximum score can be obtained (provided that the task is completed correctly and submitted for review on time):

1. Analysis of the device's target audience and its concept - 5 points
2. Assembly with device renders (themes) in SolidWorks (or other software, as agreed with the instructor) – 20 points.
3. Instructions for your device (theme) in *.pdf format - 15 points.
4. Presentation of the device (theme, provided it is submitted for review on time) – 5 points.

Continuous assessment: MCW at the end of the course, maximum score for MCW is 35 points.

Calculation and graphic work – 20 points (the quality of the presentation (10 points) and the report (10 points) are assessed).

Semester assessment: test.

Table of correspondence between rating points and university scale grades

Number of points	**Grade**
100-95	Excellent
94	Very good
84	Good
74-65	Satisfactory
64-60	Sufficient
Less than 60	Unsatisfactory
Admission requirements not met	Not admitted

9. Additional information on the discipline (educational component)

Description of material, technical, and informational support for the discipline

Computer, *SolidWorks* software *(student license)*, *Microsoft Office* (or any other text editors and presentation software)

Work program for the academic discipline (syllabus):
Compiled by Y. L. Zinger;
Approved by the PRE Department (Minutes No. 06/2025 dated 06/25/2025)
Approved by the methodological commission of the faculty/research institute (protocol No. 06/2025 dated 26.06.2025)