GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer aided design, PG_00057704		
Field of study	Komputerowe wspomaganie projektowania		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Iwona Cichowska-Kopczyńska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	0.0	45.0	0.0	45

E-learning hours included: 0.0

Additional information:

Zasady obecności i nadrabiania zaległości

1. **Obecność na zajęciach jest obowiązkowa.**
2. **Usprawiedliwienie nieobecności** następuje wyłącznie na podstawie **zaświadczenia lekarskiego**.
3. **Dopuszcza się jedną nieusprawiedliwioną nieobecność** w semestrze.
4. **Nieobecność nie zwalnia studenta** z obowiązku nadrobienia zaległości programowych.
5. **Materiał z opuszczonych zajęć należy opanować we własnym zakresie** przed pierwszymi zajęciami po powrocie.
6. **Zakres i formę uzupełnienia zaległości** (np. konsultacje, dodatkowe zadania, oddanie brakujących sprawozdań) **określa prowadzący**.

Postanowienia niniejszej sekcji stanowią integralną część karty przedmiotu i obowiązują wszystkich uczestników zajęć.

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	45	2.0	28.0	75

Subject objectives

The course familiarises students with the capabilities of CAD/CAE software and principles for selecting tools to address engineering problems. It develops skills in applying design-process algorithmsfrom requirements definition, through modelling and variant analysis, to validation and documentation. It also introduces project-management, documentation-design, and team-collaboration software. Students learn to set objectives and milestones, create schedules, assign tasks, and monitor progress using reporting and simple indicators. They work in teams using communication tools, shared documents, and version control, and conduct peer assessment. The course prepares them for independent and collaborative project work using modern digital tools.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U04] capable of formulating and solving design tasks in the field of environmental technology to recognize their non-technical aspects, including environmental, economic and legal. Is capable of applying the principles of occupational health and safety. Is able to make initial assessment of engineering solutions and actions	The student is able to assess the impact of various factors and technological parameters on the environment, including the economic environment, the natural environment, and the work environment. Is able to analyze risk and propose a method to minimize the impact of negative aspects.	[SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania [SU4] Ocena umiejętności korzystania z metod i narzędzi [SU2] Ocena umiejętności analizy informacji [SU1] Ocena realizacji zadania
[K6_W07] has knowledge of basic terminology and principles of intellectual property protection necessary for proper interpretation and application in practice	The student is able to correctly use the terminology of the subject, is able to follow the rules of intellectual property and copyright, and is able to quote correctly sources	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym
[K6_W04] is aware of the importance of environmental protection and has a basic knowledge of chemical and biological threats to the environment, with particular emphasis on anthropogenic factors, has a basic knowledge of knowledge of the principles of sustainable development as well as national and European environmental management conditions.	Students know how to correctly identify risk factors and impacts. They understand the basic principles of sustainable development (including elements of the circular economy and eco-design) and their importance in engineering design.	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym [SW1] Ocena wiedzy faktograficznej

Subject contents	Course content – project The course combines computer-aided design (CAD/CAE) with process simulations and elements of project management. It emphasises selecting appropriate tools to solve specific engineering problems and the algorithms of the design processfrom requirements definition, through modelling and variant analysis, to validation and preparation of complete documentation. Thematic blocks **Project management and team collaboration** Defining objectives and milestones, building schedules, task allocation, monitoring and evaluation of progress (reports, indicators), team communication, shared documentation and version control; peer assessment of contributions and task quality. **Graphical representation of technological processes** Use of 2D CAD software to depict processes, diagrams and equipment. Projection as the basic method of mapping three-dimensional objects onto a plane; orthographic projections; sections and intersections of planar and spatial objects; dimensioning and notation rules in technical drawing. **Process simulations** Thermodynamic models, material and energy balances, principles of running simulations, sensitivity analysis, what-if scenarios, and optimisation of simple process systems. Equipment design. **3D modelling** Spatial structures of equipment. **Technical drawing and documentation** Spatial, assembly and manufacturing drawings; bills of materials (BOM); documentation design. **Non-technical aspects and engineering responsibility** OHS principles in design and laboratory work; elements of environmental protection and sustainable development (introductory environmental indicators); preliminary economic analysis (basic CAPEX/OPEX) as well as fundamentals of intellectual property and licence compliance in projects. Semester structure **Part I:** tool-focused workshopsCAD/CAE, fundamentals of drawing and documentation, introduction to process simulation, and to project-management and team-collaboration tools. **Part II:** execution of a project task with team collaboration using the tools learned; milestone reviews, verification of models and documentation, presentation of results. Deliverables and requirements • Drawing package: process block diagrams, 3D design + assembly/manufacturing drawings, BOM. • Simulation model: statement of assumptions, results, sensitivity analysis, conclusions. • Material and energy (M&E) balances and a brief note on variant optimisation. • Project documentation using the provided template. • Project plan: objectives, milestones, schedule, progress and risk reports. • Peer assessment. • Appendices: safety sheets, outline of environmental aspects, and a preliminary economic analysis.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Computer literacy, ability to save and open files, copy, create archives, use e-mail, knowledge of the Office suite, geometry, dimensioning principles, basics of thermodynamics, process engineering, chemical technology, technological principles, principles of green chemistry, green engineering, chemical industry equipment</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Process design</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>Project and team work</td><td>60.0%</td><td>20.0%</td></tr>
<tr><td>Additional tasks</td><td>60.0%</td><td>20.0%</td></tr>
<tr><td>Simulation design</td><td>60.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">• Giesecke, F.E. et al., Technical Drawing with Engineering Graphics, 15th ed., Peachpit Press, 2016.
• Towler, G., Sinnott, R., Chemical Engineering Design: Principles, Practice and Economics of Plant and Process Design, 2nd ed., Elsevier, 2012.
• Smith, J.M.; Van Ness, H.C.; Abbott, M.M.; Swihart, M.T., Introduction to Chemical Engineering Thermodynamics, 8th ed.,
• ISO standards</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Pikoń J., AutoCAD 2002, Helion, Warszawa 2002.
2. Tarnowski Wojciech, Symulacja komputerowa procesów ciągłych, Koszalin, Wyższa Szkoła Inżynierska
w Koszalinie 1996.
3. A. Jaskulski, Autodesk Inventor Professional 2018PL, PWN, 2017</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Graphical representation of the technological process, technological diagram,3D design of the device, simulation of the technological process, process optimization in terms of raw material consumption, waste emissions</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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