University of Gdańsk

Subject card

Subject name and code	Basics of Machine Design and Engineering Graphics - classes, PG_00198795						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Subject group related to practical vocational preparation		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		1.0		
Learning profile	practical		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Leszek Flis				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	24.0	0.0	0.0	0.0	24
	E-learning hours included: 0.0						
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	24		1.0		5.0	30
Subject objectives	Transmission of knowledge and skills in the basics concerning the construction notation, construction and operation of machine elements, principles of their calculation and design						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-W12] knows and understands, at an advanced level, the key processes occurring in the life cycle of devices, facilities, and technical systems	knows at an advanced level the principles of machine design using CAD/CAE computer methods	[SW2] presentation/project/paper/ report
[HML3-K02] is ready to correctly determine the priorities in professional work for the implementation of a task specified by himself/ herself or others	is ready to set priorities in their professional work in order to carry out tasks set by themselves or others in areas requiring basic technical knowledge of the construction, design, and engineering of technical equipment	[SK2] presentation/project/paper/ report
[HML3-U01] is able to plan and conduct experiments, including computer simulations, interpret the results obtained and draw conclusions	is able to plan and carry out experiments, including computer simulations, interpret the results obtained and draw conclusions on the prototyping of basic machine structures;	[SU2] presentation/project/paper/ report
[HML3-U10] is able to design - in accordance with the given specification - and make a simple device, object, system or implement a process typical for the field of study, using appropriately selected methods, techniques, tools and materials	is able to design according to a given specification a selected machine part using CAD/CAE computer aided design techniques	[SU2] presentation/project/paper/ report
[HML3-U04] is able to use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks	is able to use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks in the design of basic machine parts	[SU2] presentation/project/paper/ report
[HML3-W03] knows and understands, at an advanced level, directions of development and the latest discoveries in the field of scientific disciplines forming the theoretical basis appropriate to the field of study	knows at an advanced level the methods of designing machine components and the criteria for evaluating the design of machine components, as well as the significance of these criteria	[SW2] presentation/project/paper/ report
[HML3-W01] knows and understands, at an advanced level, selected facts, phenomena and processes, as well as methods and theories concerning them, explaining the complex relationships between them, constituting basic general knowledge in the field of scientific disciplines forming the theoretical foundations specific to the field of study	knows an advanced knowledge of standardization in the design and unification of machine components and assemblies	[SW2] presentation/project/paper/ report

Subject contents

Engineering Graphics: Projection. Principles of orthogonal projection in technical drawings. Dimensioning. Basic types of mechanical technical drawings. Tolerance and fit. Indicating the surface finish of objects. Rules for creating drawings of machine parts and connections. Application of CAD in creating technical documentation.

Fundamentan of Machine Design: Designing ship structural components. Calculating allowable stress for static and fatigue loads. Detachable connections. Non-detachable connections. Bearings. Flexible elements. Couplings and brakes. Shafts and axles. Gears. Ship structural components. Fundamentals of computer-aided engineering (CAE) calculations.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
project	51.0%	100.0%

Recommended reading

Basic literature	DOBRZAŃSKI T.: Rysunek techniczny maszynowy. WNT, Warszawa 2014. (in Polish) SZOPA T.: Zasady projektowania i obliczeń inżynierskich. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2013. (in Polish)
Supplementary literature	SINGH A.: Fundamentals of Machine Design. Volume 1 and 2. UK, Cambridge University Press, 2017.
eResources addresses	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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