

SYLLABUS

Course description

Course code	Course	GRAFIKA INŻYNIERSKA	
MB/ O/I/NST/B1.1		ENGINEERING GRAPHICS	
Language of instruction	English		
Academic year	2023/2024		
field of study:	Mechanics and machine construction		
field of specialisation:	All		
Educational level	first-cycle studies		
Education profile	General academic		
Mode of study	Part-time studies		
Semester(s)	1, 2		
Affiliation with a group of classes	Core subjects		
Course status	Obligatory		
Types of classes, instruction hours, ECTS credits	Types of classes	Number of instruction hours	Number of ECTS credits
	Lecture	8/8 [h]	7 ECTS (3 ECTS/4 ECTS) ECTS
	Laboratory classes	20/24[h]	
Linkage of the course	with the education profile	related to scientific activity in the discipline to which the field of study is assigned	7 ECTS
	with qualifications	gaining engineering competences	7 ECTS
	with science discipline	Mechanical engineering	7 ECTS
Form of teaching	Traditional – classes organized at the University /classes conducted using online learning methods and techniques		
Prerequisites	knowledge and skills acquired in high school in the field of plane and space geometry		
Department	Faculty of Mechanical Engineering UTH Radom		
Coordinator	Piotr Sadowski, BEng, PhD		
The website of the basic organizational unit	www.mechaniczny.uniwersytetradom.pl		
E-mail address, phone number of the coordinator	p.sadowski@uthrad.pl 48 361 76 27		

LEARNING OUTCOMES, CURRICULUM CONTENT, TEACHING CLASSES, VERIFICATION OF LEARNING OUTCOMES

Learning Objective:	C1 - acquiring the ability to map spatial geometric formations on the drawing plane using Monge's projection and axonometric projection C2 - acquiring the ability to prepare and read construction documentation, with particular emphasis on the principles of drawing up technical machine drawings.
Curriculum Content:	<p>Lecture: semester I – W1, U1: Basic elements of space, Euclidean and projective space, methods of descriptive geometry, parallel projection and its properties, Monge projections on three viewports; Mapping of the basic elements of space; measurement issues; representation of spatial figures; Sections of polyhedra and solids of revolution by plane; Interpenetration of polyhedra and solids of revolution; axonometric projection; Normalization in technical drawing, graphic form of the drawing sheet, drawing lines and their applications, drawing scales; Arrangement of orthogonal projections in technical drawing (European and American methods). semester II – W1, U2: views and sections; Dimensioning rules; Tolerances of linear and angular dimensions as well as tolerance of shape and position. Determination of surface roughness, heat treatment, protective coatings; Presentation of detachable and inseparable connections of machine elements in drawings; Production drawings of parts and assembly drawings of parts assemblies, making changes to technical drawings, drawing management.</p> <p>Content of laboratory classes: semester I – W1, U1: Mapping of polyhedrons based on selected measurement relationships, metric problems; Sections of polyhedra; Mapping of rotary surfaces, cross-sections of rotary surfaces; Penetration of rotating surfaces; Mapping of complex spatial geometric formations in orthogonal projections based on the model; Creating an axonometric projection based on the model and orthogonal projections; Creating orthogonal projections using views and various cross-sectional forms based on the model; test/pass. semester II – W1, U2: The use of computer CAD programs to create construction documentation; dimensioning of machine elements; Tolerances of linear and angular dimensions as well as tolerance of shape and position. Determination of surface roughness, heat treatment, protective coatings; Detailed drawing of typical machine elements; Detachable and non-detachable connections of machine elements; Assembly drawing of the assembly; Detailing assembly elements; pass/test.</p>
Didactic (educational) methods:	<ul style="list-style-type: none"> – informative lecture with the use of audiovisual means, – laboratory method – activities at the computer
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	<p>Assessment credit. The condition for passing the course is to achieve all the required learning outcomes specified for a given subject. Obtaining positive grades in all forms of classes included in a given subject is tantamount to passing it and obtaining by the student the number of ECTS points assigned to this subject. The method of calculating the grade for individual forms of classes: Lecture - the condition for getting credit is to achieve all the required learning outcomes for this form of classes and to obtain positive grades using the assessment methods adopted for the subject. The final grade of the lecture is the sum of the grades: 90% of final papers/test, 10% of class activity. Laboratory exercises - the condition for passing is to achieve all the required learning outcomes for this form of classes and to obtain positive grades using the assessment methods adopted for the subject. The final grade is the sum of grades: 90% of laboratory work and a possible final test, 10% of class activity.</p>

Learning outcomes for the course in relation to the field of study learning outcomes and the type of classes	Methods of verifying learning outcomes				
Learning outcome number	Description of the learning outcomes for the course (PEU) A student who has passed the course (W) knows and understands / (U) can / (K) is ready to:	Field of study learning outcome (KEU)	Types of classes	Form of verification (credits)	Methods of testing and assessment
W1	Knows and understands the principles of engineering graphics and tools used in the preparation of technical documentation	K_WG(04)	lecture	pass for a grade/test	final works
U1	Can perform mapping of three-dimensional geometric forms, differently located in relation to the viewport, in rectangular and axonometric projections.	K_UW(12)	Laboratory exercises	pass for a grade/test	correct execution of the task
U2	He is able to draw up an executive drawing of a single element of a machine and an assembly drawing of a set of parts, taking into account the principles contained in the Polish Standards regarding the technical drawing of a machine.	K_UW(12)	Laboratory exercises	pass for a grade/test	correct execution of the task
U3	He can use the basic tools of CAD programs to facilitate the	K_UW(05) K_UW(14)	Laboratory exercises	pass for a grade/test	correct execution of the task

	precise execution of drawings				
K1	Is ready to complement and critically evaluate specialist knowledge and is able to choose the right sources of knowledge and methods of teaching himself and others	K_KR(01)	Laboratory exercises	conversation	conversation
K...	He understands the need to use modern design support programs in engineering practice	K_KO(03) K_WG(11)	Laboratory exercises	conversation	conversation

Literature and teaching aids

1. Gruszka P.: Geometria wykreślna. Odwzorowanie prostokątne i aksonometryczne. Wydawnictwo Politechniki Radomskiej, 2009
2. Lewandowski Z. Geometria wykreślna. PWN Warszawa, 1978
3. Otto F., Otto E.: Podręcznik geometrii wykreślnej. PWN Warszawa, 1994
4. Dobrzański T.: Rysunek techniczny maszynowy. WNT Warszawa, 2019
5. Paprocki K.: Zasady zapisu konstrukcji. OWPW Warszawa, 2006
6. A set of PN-EN ISO standards (concerning technical drawing and technical machine drawing)
7. Pikoń A.: AutoCAD 2020 PL. Pierwsze kroki. Helion, Gliwice 2019
8. Kęska P.: SOLIDWORKS 2020 – Modelowanie części, Złożenia oraz Rysunki, e-book, CADvantage®, Warszawa 2020
9. Domański J.: SolidWorks 2020. Projektowanie maszyn i konstrukcji. Praktyczne przykłady. Helion, Gliwice 2020

Student workload required to achieve the assumed learning outcomes – the balance of ECTS credits			
Attendance, participation	Student workload [h].		
	Other contact hours (IGK)	Student's self-study hours Classes without a teacher (ZBN)	Classes
Participation in ... lectures	X	X	8/8 [h]
Participation in classes/laboratory classes	X	X	20/24[h]
Meeting with teachers	15 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit /	X	20[h]/60[h] 20 [h]	X
Total student workload	15 [h]/ 0,6 ECTS	100 [h]/4 ECTS	60[h]/ 2,4 ECTS
ECTS credits for the	175 h/ 7 ECTS		

Additional information, comments
<p>In the case of students with special needs, including disabilities, and chronic illnesses, the methods and forms of verification of learning outcomes specified above (in the syllabus) are adapted to the individual needs of these students, as appropriate.</p> <p>Detailed rules and forms of support for students with special needs, including those with disabilities and chronically ill, during classes, credits, and exams are specified in: University Regulations (Regulamin Studiów Uniwersytetu Technologiczno-Humanistycznego w Radomiu), Study Regulations (Zasady Studiowania), and Procedure for Ensuring Accessibility of the Educational Process to Students with Special Needs, Including Those with Disabilities and Chronically ill (Procedura dotycząca zapewnienia dostępności procesu kształcenia studentom ze szczególnymi potrzebami, w tym: z niepełnosprawnością, przewlekle chorych).</p>