

SYLLABUS

Course description

Course code	Course	ELEKTROTECHNIKA I ELEKTRONIKA		
MB/O/I/ST/B1.11		ELECTRICAL ENGINEERING AND ELECTRONICS		
Language of instruction	English			
Academic year	2023/2024			
field of study:	Mechanical Engineering			
field of specialisation:	All			
Educational level	first-cycle studies			
Education profile	General academic			
Mode of study	Full-time studies			
Semester(s)	3			
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	30 [h]	4 ECTS	
	Classes	30 [h]		
Linkage of the course	with the education profile	Related to the conducted scientific activity in the discipline to which the field of study is assigned		0 ECTS
	with qualifications	It is used to acquire engineering competences by the student		4 ECTS
	with science discipline	Mechanical engineering		4 ECTS
Form of teaching	Traditional – classes organized at the University /classes conducted using online learning methods and techniques			
Prerequisites	Basic knowledge in physics, computer science and mathematics			
Department	Faculty of Mechanical Engineering			
Coordinator	Dr hab.inż. Iwona Komorska			
The website of the basic organizational unit	www.wm.uniwersytetradom.pl			
E-mail address, phone number of the coordinator	48 3617634; iwona.komorska@uthrad.pl			

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

Learning Objective:	Gaining knowledge in the field of: basic laws of electrical engineering, electronic components and their characteristics, and electronic signal processing. Acquisition of the ability to use the basic laws of electrical engineering in the calculation of electrical circuits and to recognize and analyze simple electronic circuits.
Curriculum Content:	Lecture: Basics of electrical measurement (2h). Ohm's law and its application in circuits with one emf source (2h). Branch circuits (2h). AC circuits. RLC systems (2h). Magnetism (electromagnetism) (2h). Electric machines (4h). Intrinsic and doped semiconductors. p-n junction. Semiconductor diodes. Rectifiers and filters (2h). Bipolar and unipolar (field) transistors (2h). Electronic systems: voltage and current stabilizers (2h). Amplifiers: transistor and integrated, generators (2h). Fundamentals of digital electronics. Basic logic functions (2h). Combination patterns (2h). Sequential circuits (2h). Basics of microprocessor technology (2h). Lab: Ohm's law (2h). The basics of connecting branched electrical circuits and their calculation using Kirchhoff's laws (2h). Rectifier diodes - rectifier circuits and filters (2h). Stabilization diodes - current and voltage stabilizers (2h). Bipolar and unipolar transistor (2h). Fundamentals of digital electronics. Gates as basic logical functions (2h). Flip-flops and counters (2h). Decoders, registers (2h). Basics of microprocessor technology (2h). Transistor amplifier (2h). Thyristor and triac (2h). Optoelectronic components (2h). Transformer testing (2h). Testing of DC and AC generators (2h). Testing of DC and AC motors (2h).
Didactic (educational) methods:	Conventional lecture using audiovisual means, verbal problem method, laboratory experiment. Laboratory classes conducted at the University on the research stands. Students work in groups, performing laboratory exercises corresponding to the content of education
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	The condition for passing the course is to achieve all the required learning outcomes specified for a given subject. Obtaining positive grades from the laboratory and lecture is tantamount to passing it and gaining by the student the number of ECTS points assigned to this subject. Lecture: the final grade for the lecture is the sum of grades: 100% grade for the written test. Laboratory exercises: 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 for laboratory exercises is the sum of grades: 40% report, 40% test, 20% activity and independence in class.

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 basic laws of electrical engineering, electronic components and their characteristics as	K_WG 08 K_WG 18 K_WG 19	lecture	mark	test

	well as the construction and principles of operation of electrical machines				
U1	Can connect the simple electrical circuits, conduct electrical measurements with multimeter and oscilloscope and apply basic electrical laws	K_UW 06	lab	mark	Report, test
U2	Can cooperate and work in a group, assuming various roles in it	K_UO 20	lab	mark	report, activity
K1	is ready to supplement and critically evaluate specialist knowledge and is able to select appropriate sources of knowledge and learning methods	K_KK 01	lab	mark	report

Literature and teaching aids
Horowitz P., Hill W.: The art of Electronics (3-rd edition), Cambridge University Press, 2015
Wai-Kai Chen: The Electrical Engineering Handbook, Elsevier Inc. 2005
The Electrical Engineering Handbook (e-book) http://www.rollanet.org/~n0klu/Ham_Radio/(eBook)%20Electronics%20-%20The%20Electrical%20Engineering%20Handbook.pdf
Dorf R.C.: The Electrical Engineering Handbook, CRC Press

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	30 [h]
Participation in laboratory classes	X	X	30[h]
Meeting with teachers during their duty hours	2 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit / exam	X	6 [h]/ 15 [h] 2 [h]/15 [h]	X
Total student workload	2 [h]/ 0,1 ECTS	38 [h]/ 1,5 ECTS	60 [h]/ 2,4 ECTS
ECTS credits for the course	100 h/ 4 ECTS		

Additional information, comments
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.
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, przewlekłe chorych).

