

# ITEM CARD (SYLLABUS)

## Item description

Code course		course name	CAD/CAE	
RA/O/I/ST/B.21			CAD/CAE	
language		Angielski		
Academic year		2022/2023		
Direction of study		Robotics and automatization of processes		
Specialization		-		
Level of education (study)		studia pierwszego stopnia		
Profile of education (study)		Ogólnoakademicki		
Form of study		studia stacjonarne		
Semester / semester		5		
Belonging to a course groups		Grupa zajęć kierunkowych		
Course status		obowiązkowy		
Form of classes, hours, points ECTS		form of classes	number of hours	number of points ECTS
		Lecture	15 [h]	4 ECTS
		Exercise	0 [h]	
		Lab	30 [h]	
Relationship subject	z profilem studiów	związany z prowadzoną działalnością naukową w dyscyplinie inżynieria mechaniczna do której przyporządkowany jest kierunek studiów		4 ECTS
	z uprawnieniami	służy zdobywaniu przez studenta kompetencji inżynierskich		4 ECTS
	z dyscypliną	Inżynieria mechaniczna		4 ECTS
Form of teaching		traditional - classes organized at the University / classes carried out with the use of distance learning methods and techniques		
Prerequisites		knowledge of mathematics, mechanics, material strength and CAD modeling		
Conducting unit		UTH Radom Katedra Technologii Maszyn		
Coordinator		dr inż. Sebastian Bombiński		
Faculty WWW address		http://mechaniczny.uniwersytetradom.pl		
mail, phone number of coordinator		<a href="mailto:s.bombinski@uthrad.pl">s.bombinski@uthrad.pl</a> (48) 361-71-16		

## COURSE OUTCOMES, METHODS OF TEACHING AND VERIFICATION OF THE EFFECTS OF EDUCATION

Purpose of the course:	<p>C1 - Acquainting with the methods of computer recording of measurements from various sensors</p> <p>C2 - Mastering the ability to build simple acquisition and signal generation systems</p>
Course teaching content:	<p>The content of the classes is related to the conducted research.</p> <p>Lecture content:</p> <p>Introduction to data acquisition systems: the basics of a / d processing - measurement range, measurement resolution, measurement frequency. aliasing and analog signal filtering, Introduction to Labview: characteristics of a virtual instrument, General characteristics of LabVIEW. front panel, block diagram, function palettes, creating VI, icon and connector, terminals, creating subVI and using it in VI, conditional structures, sequence structure, for and while loop, feedback node, graphing, formula node, expression node, methods creating and operating on matrices, creating and operating on clusters, error cluster, operations on strings, files and operations on them, programming techniques, debugging, handling communication ports</p> <p>Equipment for data acquisition: measurement cards for various applications - conventional voltage measurements, strain gauge measurements, measurements with the use of thermocouples, generation cards, communication with measuring devices, machines, e.g. profibus.</p> <p>Project content:</p> <p>The laboratory classes consist of several separate exercises:</p> <p>Building a virtual calculator</p> <p>Construction of a system for testing the characteristics of analog filters.</p> <p>Building a system for recording data from a thermocouple,</p> <p>Building a system for recording data from strain gauges.</p>
Method of teaching:	<p>informative lecture combined with a power-point presentation; programmed methods (using a computer to build software for measurement systems),</p> <p>practical methods (construction of measuring stands with the use of computers, measuring cards, sensors and filters.)</p>
The rigor of passing, the criteria for assessing the learning outcomes achieved, the method of calculating the final grade:	<p>The condition for completing the course is achieving all the required learning outcomes specified for the course.</p>

Education effects for the course in relation to the direction effects and form of classes				Verification methods of learning outcomes	
number of education effect	Description effects of education for the subject Student who has completed the course (W) know/(U) be able/(K) can:	Directional learning effect (EKK)	Form of realization of teaching	examination form	Form check
W1	He knows the rules of application of measuring devices and systems in various technical facilities. Has detailed knowledge of the characteristics of analog and digital signals and their parameters.	K_W10	lecture	Written tests	Assessment of the exam
U1	He has practical skills in setting up measuring equipment and carrying out measurements with the use of computer systems	K_U05	laboratory classes	Written tests	Assessment of written tests, assessment reports
U2	Can speak English sufficiently to read and understand catalog cards, application notes, team and teacher communication, documentation of acquisition systems development	K_UK16	laboratory classes	Observation, conversation, report	Verbal evaluation, report evaluation
K1	Is aware of responsibility for their own work and readiness to submit to the principles of teamwork and responsibility for jointly performed tasks.	K_U17	laboratory classes	Written tests	Assessment of the test

Recommended reading, literature supplement, teaching aids
1. Richard G. Lyons: Understanding Digital Signal Processing, Pearson; 3rd edition (November 1, 2010) 2. Presentation of the lectures in pdf format. 3. National Instruments information materials from the website <a href="https://www.ni.com/pl-pl.html">https://www.ni.com/pl-pl.html</a> 4. Instructions for design tasks

Student workload - the balance of ECTS credits			
Participation in classes, activities	student load [h]		
	Other hours. Contact (IGK)	Classes without a teacher (ZBN)	classes
Udział w wykładach/ćwiczeniach/laboratorium	X	X	15[h]/30[h]/0[h]
Udział w konsultacjach	5 [h]	X	X
Przygotowanie do wykładów/ćwiczeń/lab Przygotowanie do zaliczenia/egzaminu	X	50 [h]	X
Sumaryczne obciążenie pracą studenta	5 [h]/ 0,2 ECTS	50 [h]/ 2,0 ECTS	45 [h]/ 1,8 ECTS
Punkty ECTS za przedmiot	4 ECTS		

Remarks
<p>W przypadku studentów ze szczególnymi potrzebami, w tym: z niepełnosprawnością, przewlekłe chorych, określone powyżej (w karcie) metody i formy weryfikacji efektów uczenia się dostosowuje się odpowiednio do indywidualnych potrzeb tych studentów.</p> <p>Szczegółowe zasady i formy wsparcia studentów ze szczególnymi potrzebami: w tym z niepełnosprawnością, przewlekłe chorych podczas zajęć, zaliczeń i egzaminów określono w: Regulaminie Studiów, Zasadach Studiowania, Procedurze dotyczącej zapewnienia dostępności procesu kształcenia studentom ze szczególnymi potrzebami, w tym: z niepełnosprawnością, przewlekłe chorych.</p>

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