

ITEM CARD (SYLLABUS)

Item description

| Code course | | course name | Systemy akwizycji danych | |
|-------------------------------------|--------------------|---|--------------------------|-----------------------|
| RA/O/I/NST/C.06a | | | Data acquisition systems | |
| language | | Angielski | | |
| Academic year | | 2024/2025 | | |
| 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 niestacjonarne | | |
| Semester / semester | | 5 | | |
| Belonging to a course groups | | Grupa zajęć kierunkowych | | |
| Course status | | Do wyboru | | |
| Form of classes, hours, points ECTS | | form of classes | number of hours | number of points ECTS |
| | | Lecture | 10 [h] | 4 ECTS |
| | | Exercise | 0 [h] | |
| | | Lab | 20 [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 | | URad. Katedra Mechaniki Stosowanej i Mechatroniki | | |
| Coordinator | | dr inż. Krzysztof Olejarczyk | | |
| Faculty WWW address | | http://wm.uniwersytetradom.pl | | |
| mail, phone number of coordinator | | k.olejarczyki@urad.edu.pl | | |

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

| | |
|---|---|
| Purpose of the course: | C1 - Acquainting with the methods of computer recording of measurements from various sensors C2 - Mastering the ability to build simple acquisition and signal generation systems |
| Course teaching content: | The content of the classes is related to the conducted research. Lecture content: Introduction to data acquisition systems: types, measurement resolution, measurement frequency. Labview/Matlab: graphical interface of the environment, characteristics of the virtual instrument. front panel, diagram structure, function palettes, VI creation, icon and connector, terminals, conditional structures, sequence structure, for and while loop, creating charts, trigger triggers, data recording and processing. Multi-channel acquisition. Data acquisition equipment: types of measurement cards, types of sensors, measurement frames, construction of the measurement track Laboratory content: The laboratory classes consist of several separate exercises: Building a virtual calculator Construction of a system for testing the characteristics of analog filters. Building a system for recording data from a thermocouple, Building a system for recording data from strain gauges. |
| Method of teaching: | informative lecture combined with a power-point presentation; programmed methods (using a computer to build software for measurement systems), practical methods (construction of measuring stands with the use of computers, measuring cards, sensors and filters.) |
| The rigor of passing, the criteria for assessing the learning outcomes achieved, the method of calculating the final grade: | The condition for completing the course is achieving all the required learning outcomes specified for the course. |

| 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 |
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| 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 https://www.ni.com/pl-pl.html 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 | 10[h]/20[h]/0[h] |
| Udział w konsultacjach | 5 [h] | X | X |
| Przygotowanie do wykładów/ćwicz/lab Przygotowanie do zaliczenia/egzaminu | X | 49 [h] | X |
| Sumaryczne obciążenie pracą studenta | 5 [h]/ 0,2 ECTS | 49 [h]/ 2,4 ECTS | 30 [h]/ 1,4 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> |

