COURSE DESCRIPTION CARD - SYLLABUS

Course name
Fundamentals of computer measuring systems [S1MwT1>PKSP]

Course

Field of study
Mathematics in Technology

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

5,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge in the scope of mathematics, electrotechnics, computer science. Ability of the efcient selfeducation in the area concerned with a chosen field of studies. Awareness of the necessity of competence broadening and ability to show a readiness to work as a team.

Course objective

Knowledge of the modern methods of measuring process automation. Knowledge of the remote control of devices, data acquisition and processing in computer measurement systems.

Course-related learning outcomes

Knowledge:
•basic knowledge in the scope of structure and design of complex microprocessor systems, especially for applications in measurements and control;
•basic knowledge in the scope of measurements of electrical quantities.
Skills:
•ability to acquire information from the literature, databases and other sources;
•ability to integrate, interpret and critically evaluate the obtained information;

•ability to plan and realize measurements of the basic electrical parameters including extraction of parameters specifying electrical systems.
Social competences:
•ability to think and act creatively and enterprisingly in the area of computer systems;
•ability to think and act in the enterprising way in the area of measuring engineering.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures: evaluation of the knowledge related to the content of lectures (test, computational and problem questions, 5 to 10 questions, 50% pass mark). Bonus activity and quality of perception during the lecture.
Laboratory classes: evaluation of knowledge and skills related to the implementation of the project and evaluation of the report made in class or at home. Evaluation of degree of completed tasks and rewarding of activity.

Programme content

Update: 06.07.2023r.
Lectures: general information, classification, functional structure and dynamics of measurements systems. Characteristics of diferent kinds of communication interfaces used in measuring devices. SCPI recommendations, model of a device, recognition of the device status, hierarchical structure of commands system, programming functions. Remote control of devices with PC computer, simple examples of a multimeter, generator, power supply. Basic application of multifunction I/O devices in measuring systems – structure, functions, parameters, configuration. The use of mathematical functions implemented in measuring instruments. Processing results from a series of measurements.
Laboratory classes: planning and implementation of laboratories tasks related to a computer measuring system, use of technical documentation, remote control of the device, use of the manufacturer’s control application, stage implementation of a computer measuring station project for an example of a device with a USB or Ethernet interface, during subsequent laboratories.

Teaching methods

Lectures: lecture with multimedia presentation supplemented by examples on the board, initiation of discussions in relation to the subject, presentation of a new topic preceded by a reminder of the previous lecture (main issues).
Laboratory classes: groups of students work as teams. Discussion on dierent methods and aspects of problem solutions. Detailed reviewing of particular laboratories documentation.

Bibliography

Basic
• Nawrocki W., Komputerowe systemy pomiarowe, WKŁ, 2007.
• Winiecki W., Organizacja komputerowych systemów pomiarowych, Oficyna Wydawnicza Politechniki Warszawskiej, 2006.
• Tumański S., Technika pomiarowa, Wydawnictwo WNT, 2013.
• Krawiecki Z., Odon A.: Wspomagane komputerowo stanowisko laboratoryjne do badania właściwości metrologicznych multimetrów na zakresach napięć przemiennych, Pomiary Automatyka Kontrola, 2007, vol. 53, nr 9 bis, s. 710-712.

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	75	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00