COURSE DESCRIPTION CARD - SYLLABUS

Course name
Mechatronics [S1ETI2>Mechat]

Course

Field of study
Education in Technology and Informatics

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
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

Lecturers

Prerequisites

Basic knowledge of physics, mathematics, electronics, automatics and computer science. The ability to solve interdisciplinary problems based on the acquired knowledge, the ability to obtain information from the indicated sources. Understanding the need to expand your competences, readiness to cooperate within the team.

Course objective

1. Provide students with basic knowledge in mechatronics, within the scope defined by the curriculum content appropriate for the field of study. 2. Developing students' skills to integrate interdisciplinary knowledge in the process of implementing mechatronic tasks. 3. Shaping students' teamwork skills.

Course-related learning outcomes

Knowledge:
How to characterize a mechatronic device, provide a functional description of mechatronic systems,
How the most important subsystems work: mechanical, electrical and electronic in a complex mechatronic device,

Skills:
How to characterize a mechatronic device, provide a functional description of mechatronic systems,

How the most important subsystems work: mechanical, electrical and electronic in a complex mechatronic device,

Social competences:
actively engage in solving the problems posed, independently develop and expand their competences, cooperate within the team, fulfill the duties entrusted as part of the division of work in the team, demonstrate responsibility for own work and co-responsibility for the results of the team's work,

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Methods of checking the effects of education
Educational effect (symbol) form of assessment assessment criteria
written/oral exam 3 50.1%-70.0%
4 70.1%-90.0%
5 from 90.1%
Colloquium 3 50.1%-70.0%
4 70.1%-90.0%
5 from 90.1%
report from laboratory exercises, oral and written answers
Credit for the laboratory based on correct performance of exercises and a report from each laboratory exercise according to the instructions of the laboratory instructor. The report is prepared by one person from the exercise subgroup. Before the exercise, a knowledge test, after the end of the exercise cycle, a written final test. To obtain credit for the labs, all exercises must be passed (a positive grade for the answers and report). K01 assessment of activity during calculation and laboratory exercises
3 the student demonstrates moderate involvement in problem-solving, when encouraged, seeks a solution based on the knowledge obtained, engages to a limited extent in the implementation of the laboratory exercise
4 the student demonstrates involvement in problem-solving, seeks a solution based on the knowledge obtained, is actively involved in the implementation of the laboratory exercise
5 the student demonstrates great involvement in problem-solving, independently seeks a solution based on the knowledge obtained, seeks additional sources of knowledge useful for solving the problem, is actively involved in the implementation of the laboratory exercise, seeks solutions in non-standard situations
assessment of the implementation of the laboratory exercise
3 the student is able to: carry out their own tasks resulting from the division of labor
4 the student is able to: approximately define the tasks to be performed by the team, participate in the division of tasks between individual team members, carry out their own tasks resulting from the division of labor, provide support to other team members to a small extent in the event of difficulties in the implementation of the assigned tasks
5 the student is able to: precisely define the tasks to be performed by the team, make a rational division of tasks between individual team members, carry out their own tasks resulting from the division of labor, coordinate the work of the entire team, provide support to other team members in the event of difficulties in carrying out the assigned tasks

Programme content

Introducing students to sensors, elements of industrial control systems, their programming and parameterization, communication between devices and the operator

Course topics

Lecture:
1. Sensory;
- measuring transducers and sensors,
- the principles of converting non-electrical quantities into electrical signals,
- principle of operation, construction and application of sensors.
2. Handling machines:
- types of handling machines,
- drive systems,

- kinematics of mechanisms,
control of handling machines,
- outline of machine programming.
3. Technique of regulation:
- types of regulation,
- control system members,
- regulators and regulation systems,
- examples of the use of regulators.
4. Communication systems
5. Principles of designing mechatronic devices
Lab:
1) Non-contact sensors
2) Time relays
3) Inverter
4) Measuring amplifier
5) PLC controllers - binary inputs / outputs
6) PLC controllers - analog inputs / outputs

Teaching methods

Lectures, supported by transparencies and multimedia presentations
Laboratory: Topics implemented in groups in teaching positions

Bibliography

Basic:
1. B.Heiman, W.Gerth, K.Popp, Mechatronika.Komponenty-metody-przykłady, PWN, Warszawa 2001
2. M.Olszewski red., Podstawy mechatroniki, Wyd. Rea s.j., Warszawa 2006
3. A. Milecki ,Ćwiczenia laboratoryjne z elementów i układów automatyzacji, Wyd. PP, 2000.
4. Instrukcje laboratoryjne dostępne podczas ćwiczeń i na stronie Zakładu Urządzeń Mechatronicznych: www.zum.put.poznan.pl

Additional:
1. M.Olszewski red., Urządzenia i systemy mechatroniczne, Wyd. Rea s.j., Warszawa 2009
2. Imaging and Machine Vision Europe, Europa Science Ltd.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	47	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	53	2,00