COURSE DESCRIPTION CARD - SYLLABUS

Course name
Communication Interfaces [N1Mech2>IK]

Course

Field of study
Mechatronics

Year/Semester
4/8

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
8

Laboratory classes
16

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

Lecturers

Prerequisites

The student starting this course should have basic knowledge of the architecture of communication interfaces and electrical signal standards. Student should also have the ability to obtain information from the indicated sources and be ready to cooperate as part of the team.

Course objective

Acquiring by the student the ability to design, configure and implement communication interfaces in automation. Transfer of knowledge on the basics of rehabilitation devices construction. Development of programming skills, documentation and reading of technical documentation, practical use of knowledge gained during studies, shaping teamwork skills.

Course-related learning outcomes

Knowledge:
1. Knowledge of the principles of description, operation and analysis of circuits, machines, devices and electrical systems.
2. Knowledge of how to apply IT tools necessary in engineering practice.
3. Knowledge of the principle of mechatronic design

Skills:

1. Ability to choose the communication interface for the appropriate application.
2. Ability to select automation elements.
3. Ability to configure selected communication interfaces.
4. Ability to make a critical analysis of the functioning of a communication interfaces.
5. Ability to obtain technical information

Social competences:
1. Understands the need for lifelong learning; can inspire and organize the learning process of others
2. Can identify priorities for the implementation of a specific task
3. Can interact and work in a group
4. Can think and act in an entrepreneurial manner
5. Is aware of responsibility for his own work and readiness to submit to the principles of teamwork and responsibility for jointly performed tasks

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Laboratory: Credit based on correct performance of exercises and a report from each laboratory exercise according to the instructions of the laboratory instructor. Development of own software based on communication interfaces. Credit for the lecture based on a written credit.

Programme content

RS232 Basics
RS485 Basics
TCP/IP Basics
CAN Basics
POWERLINK Basics
MODBUS Basics

Course topics

Lecture:
1. Introduction to communication interfaces
2. RS232, RS485 communication interface
3. TCP/IP communication interface
4. CAN communication interface
5. POWERLINK communication interface
6. MODBUS communication interface
7. MQTT, OPCUA communication interfaces

Laboratory:
1. Introduction to classes
2 - 3. RS232 interface
4 - 5. TCP/IP interface
6 - 7. Modbus interface
8- 9. OPCUA interface
10- 11. POWERLINK interface
12-13. USB interface
14 - 15. Development of own software using selected interfaces

Teaching methods

Lecture: multimedia presentation and software usage demonstration
Laboratory: Exercises performed by students in groups under the supervision of the instructor

Bibliography

Basic:
1. W. Mielczarek: Szeregowe interfejsy cyfrowe. HELION 2008
2. J. Bogusz: Lokalne interfejsy szeregowe w systemach cyfrowych. BTC, 2004

Additional:
1. W. Nawrocki: Komputerowe systemy pomiarowe. WKŁ, W-wa 2002
2. Michael Gook, Interfejsy sprzętowe komputerów PC Helion 2005

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	24	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	51	2,00