POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Digital technology [S1AiR2P>TC]

Course

Field of study	Year/Semester
Automatic Control and Robotics	2/4
Area of study (specialization)	Profile of study
–	practical
Level of study	Course offered in
first-cycle	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	30	0
Tutorials	Projects/seminars	
0	0	

Number of credit points

3,00

Coordinators

dr hab. inż. Konrad Urbański
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Lecturers

Prerequisites

A student beginning the course should have knowledge and skills in the basics of programming, electronics, numerical methods and simulation. He or she should also have the ability to obtain information from indicated sources.

Course objective

The student acquires knowledge of the parameters and operation of basic digital systems. Becomes familiar with methods of designing digital systems.

Course-related learning outcomes

Knowledge:
Knows and understands to an advanced degree the theory and methods in the principles of operation of basic electronic, analogue and digital components, selected electronic circuits and systems.

Skills:
Can communicate using a variety of techniques in a professional and other environment; can build, commission and test a simple electronic circuit; can design simple electronic circuits for a variety of

applications.

Social competences:
Is ready to set priorities to achieve a task defined by him/herself or others; is aware of the need to approach technical issues in a professional manner, to be scrupulously familiar with the documentation and the environmental conditions in which the equipment and its components may operate; is ready to respect the principles of professional ethics and to demand this from others, respecting diversity of views and cultures.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified by the colloquium carried out at the last lecture. Students will have access to a list of issues in force at the colloquium. Skills acquired as part of the laboratory are verified on an ongoing basis during the classes.

Programme content

Basic elements and circuits of digital technology
Methods of implementing logic functions
Issues of connecting digital elements with external devices.

Course topics

1. Basic issues
 2. Asynchronous and synchronous systems
 3. Analog-to-digital and digital-to-analog converters
 4. Construction and principle of operation of basic logic gates
 5. Methods of minimizing logical functions
 6. Flip-flops, counters, registers, encoders, decoders, multiplexers, demultiplexers
 7. Digital integrated circuits and microprocessors
 8. Bitwise operators in programming languages
 9. Practical aspects of digital circuit interconnections.

Teaching methods

The training methods used:
- a lecture with a multimedia presentation (including: drawings, photographs, animations, sound, films) supplemented by examples given on the board
- a lecture conducted in an interactive way with formulation of questions to a group of students
- presentation of a new topic preceded by a reminder of related content known to students from other subjects

laboratories:
- working in teams
- computational experiments and performance of the tasks given by the instructor.

Bibliography

Basic:
1. Podstawy techniki cyfrowej, A. Skorupski, WKŁ 2004 (IBUK@PP)
2. Podstawy elektroniki cyfrowej,J. Kalisz, WKŁ 2007

Additional:
1. The Art of Electronics, P. Horowitz, W. Hill, Cambridge University Press; 2015
2. The Essence of Digital Design, B. Wilkinson, Pearson P T R 1997

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00