Subject programme

1. Subject name / subject module: **Network Interfaces**
2. Lecture language: **English**
3. The location of the subject in study plans:
   - Area or areas of the studies: **Computer Control Systems Engineering**
   - Degree of the studies: **2nd degree studies**
   - Field or fields (implementation of effects standard): **Mechatronics**
4. Supervision of subject implementation:
   - The Institute / Another unit: **Institute of Informatics and Mechatronics**
   - The person responsible for the subject: **Buler Piotr, mgr**
   - People cooperating in the development of the programme of the subject:
5. The number of hours and forms of teaching for individual study system and the evaluation method:

Mode of study	Teaching activities with the tutor – Form of classes												Total
	...	SOW	ECTS	Laboratory work	SOW	ECTS	...	SOW	ECTS	...	SOW	ECTS	ECTS
Full-time studies				34	41	3							**3**
Part-time studies													
Credit rigor				Graded assigment									

6. Student workload – ECTS credits balance:
   1 ECTS credit corresponds to 25-30 hours of student work needed to achieve the expected learning outcomes including the student's own work

Activity (please specify relevant work for the subject)	**Hourly student workload (full-time studies/part-time studies)**
Participation in lectures	-
Participation in laboratory classes	34
Independent study of the subject	-
Preparation to laboratory classes	41
Participation in an exam / graded assignment	-
Total student workload (TSW)	75
ECTS credits	3
* Student's workload related to practical forms	75
Student's workload in classes requiring direct participation of academic teachers	34

7. Implementation notes: recommended duration (semesters), recommended admission requirements, relations between the forms of classes:
   - Recommended admission requirements – none.
   - Recommended duration of the subject is taken from the course plan.
8. Specific learning outcomes – knowledge, skills and social competence:

Specific learning outcomes for the subject		Form	Teaching method	Methods for testing of (checking, assessing) learning outcomes
Outcome symbol	Outcome description			
Knowledge				
K_W02	**Student has a wide and an advanced knowledge of computer networks and knows how to apply this knowledge in practice while working in mechatronics environment.**	**Laboratory work**	**Inquiry methods**	**Student learning activities**
K_W07	**Student has structured and theoretically founded knowledge in the field of technical informatics, covering key issues encountered in computer networks, especially those related to network interfaces. Student knows the practical application of this knowledge in mechatronics through the use of appropriate methods and tools.**			
Skills				
K_U02	**Student is able to use information and communication techniques (ICT) with particular emphasis on the creation of project documentation related to network interfaces in computer networks, for the purposes of implementing projects and tasks in the field of mechatronics.**	**Laboratory work**	**Inquiry methods**	**Student learning activities**

9. Assessment rules / criteria for each form of education and individual grades:

Activity	Grades	Calculation	To final
Assessment of the implementation of exercises in the classroom	dst (3), db (4), bdb (5)	arithmetic mean (3,4,5) * 60%	3
Assessment of class activity - substantive contribution to the discussion	bdb (5)	5*30%	1,5
Attendance	at 80% of classes	0,80*5 -> 4,0*10%	0,4
Final result			4,9

0 – 3.00	ndst	**4.01 – 4.50**	db
3.01 – 3.50	dst	**4.51 – 4.7**	db+
3.51 – 4.00	dst+	**4.71 – 5.0**	bdb

10. The learning contents with the form of the class activities on which they are carried out

a. Interfaces of the local area networks. (Laboratory work)
b. The physical layer of the Ethernet interfaces. (Laboratory work)
c. Normal Link Pulse (NLP) and Fast Link Pulse (FLP) protocols. (Laboratory work)
d. Data link layer and frame formats in Ethernet interfaces. (Laboratory work)
e. EtherChannel - an effective way of port aggregation. (Laboratory work)
f. WAN interfaces - ADSL, V.35, HSSI, SmartSerial. (Laboratory work)
g. Optical interfaces - single-mode and multi-mode fibers, wavelengths. (Laboratory work)
h. Attenuation and dispersion (mode, chromatic, waveguide, matrial dispersion). (Laboratory work)
i. Wavelength Division Multiplexing (WDM) techniques. (Laboratory work)
j. UniDirectional Link Detection (UDLD) protocol. (Laboratory work)

11. Required teaching aids

a. Lecture - multimedia projector.
b. Laboratory classes - specialist laboratory.

12. Literature:

a. Basic literature:

1. Chris C., William W., Richard B., Noel R.: Cisco Networks, Apress, Berkeley, 2015.
2. Neumann J. C.: Cisco Routers for the Small Business, Apress, New York, 2009.

b. Supplementary literature:

Akademia sieci Cisco CCNA Exploration : semestr 1 : podstawy sieci, Dye Mark A. , McDonald Rick, Rufi Antoon W. , Piech Stanisław (tłum.), Warszawa 2008.
Dordal P. L.: An Introduction to Computer Networks, Loyola University, Chicago, 2020.

c. Internet sources:

13. Available educational materials divided into forms of class activities (Author's compilation of didactic materials, e-learning materials, etc.)

14. Teachers implementing particular forms of education:

Form of education	Name and surname
1. Lecture	
2. Laboratory classes	Buler Piotr, mgr
3. Training	
4. Project classes	
5. Workshop classes	
6. Simulation game	
7. Language classes	