Bialystok University of Technology, Faculty of Mechanical Engineering									
Field of study	*Mechatronics*							**Degree level and programme type**	*second-cycle (MSc, Eng) full-time studies*
Specialization/ diploma path	*Common course*							**Study profile**	*academic*
Course name	*Communication in processor systems*							**Course code**	*IS-FME-00261S*
								Course type	
Forms and number of hours of tuition	**L**	**C**	**LC**	**P**	**SW**	**FW**	**S**	**Semester**	*summer*
	30		*30*					**No. of ECTS credits**	*5*
Entry requirements	-								
Course objectives	*Getting students acquainted with possibilities of communication in various microprocessor-based systems.*								
Course content	*Lecture: Communication protocols architecture in processor systems. Physical layer, cabling and network parameters. Communication in a network using open and proprietary protocols. Data frames and protocol structure. Programming of cyclic and acyclic process data exchange. Network devices and peripheral support in processor systems.* *Laboratory: Communication in microprocessor systems, programmable logic controllers (PLCs) and field-programmable gate arrays (FPGAs).*								
Teaching methods	*Information and problem lecture; Laboratory classes*								
Assessment method	*Lecture: examination* *Laboratory classes: evaluation of: entry tests, students' reports, students' participation in discussions and activity during classes*								

Symbol of learning outcome	**Learning outcomes** **Students who successfully complete the course:**	**Reference to the learning outcomes for the field of study**
LO1	*know and understand information exchange methods in processor systems*	*MK2_W06*
LO2	*know and understand how processor systems can be used in industry*	*MK2_W04*
LO3	*know and understand design principles of processor systems*	*MK2_W02*
LO4	*can verify experimentally the correctness of communication of processor systems*	*MK2_U06*
LO5	*can design and build multiprocessor systems*	*MK2_U07*
LO6	*can analyse existing solutions and suggest modifications*	*MK2_U08*

Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	*Lecture: examination;*	*L*
LO2	*Lecture: examination;*	*L*
LO3	*Lecture: examination;*	*L*
LO4	*Laboratory classes: evaluation of: entry tests, students' reports, students' participation in discussions and activity during classes*	*LC*
LO5	*Laboratory classes: evaluation of: entry tests, students' reports, students' participation in*	*LC*
LO6	*Laboratory classes: evaluation of: entry tests, students' reports, students' participation in discussions and activity during classes*	*LC*

Student workload (in hours)	**No. of hours**
Participation in lectures	*30*
Participation in laboratory classes	*30*
Preparation for examination based on lecture content; participation in examination	*31*

Calculation	*Preparation for laboratory classes*	*24*
	Preparation for passing laboratory classes	*5*
	Participation in consultations	*5*
	TOTAL:	*125*

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	*67*	*2.7*
Student workload – practical activities	*61*	*2.4*

Basic references	*1. AVR i ARM7. Programowanie mikrokontrolerów dla każdego, Paweł Borkowski, Helion, Warszawa 2010* *2. Mikrokontrolery AVR. Język C - podstawy programowania, Mirosław Kardaś, Wydawnictwo ATNEL, Szczecin 2011* *3. Programowanie sterowników czasu rzeczywistego w układach PLD i FPGA, Zbigniew Kulesza, Oficyna Wydawnicza Politechniki Białostockiej, Białystok 2015.* *4. Dzierżek K., Programowanie sterowników GE Fanuc w przykładach i zadaniach, Wyd. Politechniki Białostockiej, 2007.* *5. Mystkowski A., Sieci przemysłowe PROFIBUS DP i PROFINET IO, Oficyna Wyd. Politechniki Białostockiej, 2012.*
Supplementary references	*1. Kwaśniewski J., Sterowniki Przemysłowe w Praktyce Inżynierskiej, Wyd. AGH, Kraków, 2007.*

Organisational unit conducting the course	*Department of Automatic Control and Robotics*	**Date of issuing the programme**
Author of the programme	*Maciej Ciężkowski, PhD*	*24.04.2019*

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar