STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Information Engineering		**1010331211010330388**

Field of study	Profile of study (general academic, practical)	Year /Semester
Automatic Control and Robotics	**general academic**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours					No. of credits
Lecture: **60**	Classes: **-**	Laboratory: **30**	Project/seminars: **-**		**8**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
basic	**university-wide**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**8 100%**
Technical sciences	**8 100%**

Responsible for subject / lecturer:

dr inż. Piotr Kaczmarek
email: piotr.kaczmarek@put.poznan.pl
tel. +48616652886
Faculty of Electrical Engineering
ul. Piotrowo 3A 60-965 Poznań

Responsible for subject / lecturer:

dr inż. Piotr Kaczmarek
email: piotr.kaczmarek@put.poznan.pl
tel. +48616652886
Faculty of Electrical Engineering
ul. Piotrowo 3A 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	basic knowledge from high school program in mathematics , computer science and logic
2	**Skills**	Student is able to obtain information from the literature , databases, and other sources; he or she has the skills of self-education in order to improve and update professional skills . He or she speaks English at a level sufficient to B2 communication , as well as reading comprehension cards catalog, application notes, manuals, equipment and descriptions of tools.
3	**Social competencies**	He or she understands the need and knows the possibilities of lifelong learning, improving professional, personal and social, skills can inspire and organize the learning of others.

Assumptions and objectives of the course:

-The aim of the course is to teach procedural programming and object-oriented language C and C ++, introduction to basic libraries and tools supporting PC programming. Theoretical background is supported by practical excercises. In addition, the lecture covers to familiarize students with the architecture of PCs, computer networks and communication interfaces and contemporary trends in the development of information systems

Upgrade in 2017: C++14, VisualStudio 2017, new examples

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has theoretical and practical knowledge related to selected algorithms and data structures and methods and techniques of procedural programming and object-oriented - [[K_W10]]

2. Student has knowledge orelated to computer architectures, systems, and computer networks and operating systems - [[K_W13]]

Skills:

1. The student is able to construct a simple solution algorithm engineering tasks and implement, test, and run it in your chosen development environment on a PC for selected operating systems - [K_U10]

2. The student is able to work individually and in a team; is able to estimate the time needed for the commissioned work; able to develop and implement a work schedule to ensure deadline - [K_U02]

Social competencies:

1. The student is aware of and understands the validity of non-technical aspects and effects of engineering activities including its impact on the environment and the resulting responsibility for the decisions - [K_K02]

Assessment methods of study outcomes

Lecture: written examination concerning the rules of procedural and object-oriented programming , architecture PC and communication interfaces

Laboratory: checking practical skills and object-oriented procedural programming in C and C++, evaluation of the test, working on classes and homework

Course description

Lecture: Number systems , basic data types , loops and conditional statements , functions, pointers, structures and dynamic data types , file handling , basic algorithms (sorting, recursive and iterative methods) , object-oriented programming , polymorphism , inheritance, OpenGL , network application programming client -server , creating a window application , processor architecture , contemporary development trends and techniques for increasing processor performance computing , data storage methods , computer networks and communication interfaces (Ethernet , USB , rS232 , rs485 , firewire , bluetooth) , the method of implementation of the physical layer networks computing and communication interfaces (wireless networks , wired , fiber) , Graphics and parallel processing methods

Laboratory : Programming in C and C ++, handling and formatting input / output , learning the use of loops and conditionals , organizing the program code by using the function . The use of tables , indices and dynamic data structures (lists one and two) . Create and design of simple objects , the use of inheritance and polymorphism , use opreratorów , supporting the use of programming libraries (OpenGL , STL , windows sokets)

Basic bibliography:

1. Bruce Eckel, Thinking in C++, Volume 2: Practical Programming

2. Irv Englander, The Architecture of Computer Hardware, Systems Software, and Networking: An Information Technology Approach

3. e-learning platform: moodle.put.poznan.pl

Additional bibliography:

1. Bjarne Stroustrup, Programming: Principles and Practice Using C++ (2nd Edition)

Result of average student's workload

Activity	Time (working hours)
1. Lecture	60
2. Laboratories	30
3. Preparation Exam / Assessment lecture	35
4. Prepare for Training and performance reports	35
5. Examination and consultation	5

Student's workload

Source of workload	hours	ECTS
Total workload	190	8
Contact hours	95	4
Practical activities	95	4