COURSE DESCRIPTION CARD - SYLLABUS

Course name
Information Engineering [S1Elmob1>PI]

Course

Field of study
Electromobility

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

prof. dr hab. inż. Wojciech Szeląg
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Lecturers

Prerequisites

Basic knowledge concerning computer science, mathematics, computer hardware, handling of computer, Windows operating system, and basic application software. 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

Learning of basic knowledge concerning computer science as well as construction and operating principles of microcomputers; learning how to devise simple algorithms; learning the basics of structural and object programming in the C++ programming language.

Course-related learning outcomes

Knowledge:
Student has a structured and theoretically founded general knowledge of computer science key issues for the electromobility area, including programming and the use of information engineering tools in modeling, simulation and design.

Skills:

He can use literature sources, integrate the obtained information, evaluate it, interpret it and draw conclusions in order to solve complex and unusual problems in the field of electromobility. Can use properly selected methods and tools, including advanced information and communication techniques, as well as develop simple applications in order to simulate, analyze and design systems appropriate for the field of study.

Social competences:
Understands the importance of improving professional, personal and social competences; is aware that knowledge and skills in the field of electromobility are evolving rapidly. Understands the importance of knowledge in solving problems in the field of electromobility; is aware of the need to use expert knowledge when solving engineering tasks beyond their own competences.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lectures: written test verifying both theoretical knowledge and practical skills (formulation of simple algorithms and writing computer programms in the C++ programming language). Additional points for activity during lectures, in particular for: preparing answers for questions provided by the lecturer; aesthetic diligence of tasks and programs developed as part of self-study, active participation in lectures and laboratory exercises in solving current tasks.

Programme content

History of computer science. Areas of research and application of computer science. Computer hardware and operating systems. Computer networks. Algorithms and data structures. Programming languages. Structural programming.

Course topics

History of computer science, its application areas and research directions. Numerical systems, integer and floating point representation of numbers, information encoding, working principles of digital systems, structure of computer system, buses, general characteristics of processors, RAM and ROM. Operating systems, computer networks. Internet, intranet. Algorithms and data structures. Chosen algorithms of analytically solvable mathematical and physical problems, and sorting"s algorithms. Programming languages. C++ programming language. Structural programming. Introduction to object programming. Programming in the C++ Builder/Visual C++ environment.
Laboratory classes: basics of programming in C ++ (syntax, development of simple algorithms and programs).

Teaching methods

Applied methods of education: a) lecture with multimedia presentation (including: drawings, photographs, animations, sound, films) supplemented by examples given on the board, b) Interactive lecture with questions to students or specific students, c) Student activity is taken into account during the course of the assessment, d) The theory presented in close connection with practice and current knowledge of students.
Laboratory classes: demonstrations, independent programming tasks.

Bibliography

Basic
1. Cormen T., Leiserson C., Rivest R., Wprowadzenie do algorytmów, WNT, Warszawa, 2007.
2. Grębosz J., Symfonia C++ standard: programowanie w języku C++ orientowane obiektowo. T. 1/2, Instytut Fizyki Jądrowej im. H. Niewodniczańskiego, Polska Akademia Nauk, Kraków, 2006.
3. Metzger P., Anatomia PC, Helion, 2007.
4. Matulewski J., Visual Studio 2013, Helion 2013.
Additional
1. Wróblewski P., Algorytmy, struktury danych i techniki programowania, Helion 2015.
2. Stasiewicz A., Ćwiczenia C++11 Nowy standard, Helion, 2012.
3.Wojtuszkiewicz K., Urządzenia techniki komputerowej. Cz.1. Jak działa komputer, PWN, 2011.

4. Barański. M., Szeląg W., Finite element analysis of transient electromagnetic-thermal phenomena in a squirrel cage motor working at cryogenic temperature, IET Science Measurement and Technology, 2012, Vol. 6 , Issue 5, pp. 357-363.

Breakdown of average student's workload

	Hours	ECTS
Total workload	110	4,00
Classes requiring direct contact with the teacher	60	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00