



Engineering studies in IT - międzynarodowy program studiów
prowadzonych przez Wydział Matematyki i Informatyki UAM w Poznaniu
Nr projektu POWR.03.03.00-IP.08-00-MPK/16

INTRODUCTION TO COMPUTER SCIENCE

Learning module description

GENERAL INFORMATION

1. Module title: Introduction to computer science
2. Module code: DINF LI0-E
3. Term: winter
4. Duration: 30h lectures + 30h laboratories
5. ECTS: 6
6. Module lecturer: Rafał Jaworski
7. E-mail: rjawor@amu.edu.pl
8. Language: English

DETAILED INFORMATION

1. Module aim: familiarize the students with the subject of computer science as an information science. The first part of the course will discuss the basic elements of information theory, how to process and store information. Then we will discuss the basic technologies used to retrieve, process and store information - a PC and a computer network. In the third, final section, we will discuss techniques and tools useful in many IT branches: modern internet services, text formatting and presentation tools, data repositories. As a supplement, the issues of data security and computer software licensing will be covered.
2. Pre-requisites in terms of knowledge, skills and social competences (where relevant):

SYLLABUS:

- Week 1: Subject of computer science, history of computer science, positional systems
- Week 2: Representations of information: fixed and floating point numbers, text, images, sounds (sampling theorem), videos.
- Week 3: Representations of information: fixed and floating point numbers, text, images, sounds (sampling theorem), videos (cont.).
- Week 4: Theory of information, entropy, Huffman coding.
- Week 5: Processing of information: compression of textual data, images, videos.
- Week 6: Data storage - methods of storing data, cloud storage, hardware RAID, XML format (DTD, XSD).
- Week 7: Computer hardware, low-level programming (logical gates, assemblers).
- Week 8: Computer hardware, low-level programming (logical gates, assemblers) (cont.)
- Week 9: Basic information about computer networks, topologies, TCP/IP.
- Week 10: Modern web applications.
- Week 11: Basic information about licensing your software (licences: GPL, MIT, Creative Commons, BSD).
- Week 12: Problems of security and privacy. Computer viruses and antivirs. Types of network attacks (eg. DDOS).
- Week 13: Data spreadsheets.
- Week 14: Text formatting and presentations (MS Word vs LaTeX, MS PowerPoint vs Beamer).
- Week 15: Data repositories (Git).