I021	Obligatory - Semester 1	**Introduction to Computer Science**	L+P+S 2+2+0	ECTS 6

Course objectives. Course objectives are to familiarize students with basic ideas and methods of computer science and programming languages. Emphasis will be given on the basics of procedural programming in C/C++. Develop students' way of thinking that enables addressing more complex algorithmic and software solutions. During exercises, students will master basic techniques of programming and learn how to deal with programming problems ranging from elementary to more complex.

Course prerequisites. Not required.

Syllabus.
1. Introduction. Historical overview of the development of computer architecture.
2. Representation of numbers (integer and rational). Elementary arithmetic in different number systems. Error analysis. Significant digits. Floating-point arithmetic. Errors in calculating of the function values.
3. Planning and program development: Programming languages. Control structures and writing programs. Repetitions or loops.
4. Functions and subroutines. Recursive functions. Local and global variables. Arrays. Pointers. Dynamic memory allocation.
5. Algorithms for some elementary problems: The problem of determining the maximum / minimum number. Search problem (binary search). Sorting problem. Recursive sorting. Matrix multiplication. Recursive matrix multiplication.
6. The basic idea of algorithm complexity.

Expected learning outcomes.
After completing the course, students are expected to:
- demonstrate the knowledge at a level that includes aspects of contemporary knowledge in the field of computer science;
- apply their knowledge and understanding in a way typical of the profession and be able to argue and solve problems in computing;
- be able to communicate their conclusions and supporting arguments to both experts and non-experts;
- possess learning ability for continuing their studies at a higher level.

Teaching methods and student assessment. Lectures will be illustrated by using the ready-made software with the help of a web-collaborative teaching system – Scriptrunner. Exercises are partially auditory and partially performed in a computer lab. Students are obliged to attend lectures and exercises. The final examination consisting of a written and an oral part takes places upon the completion of lectures and exercises. Students may affect their final grade by doing homework or writing a seminar paper during the semester.

Can the course be taught in English: Yes.

Basic literature:
1. D. Matijević, N. Truhar, Uvod u računarstvo, available on the course website.

Recommended literature:
1. L. Budin, Informatika za 1. razred gimnazije, Element, 2000.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms, MIT Press, 2009.
3. R. Mata-Toledo, P. Cushman, Schaum's outline of Introduction to Computer Science. McGrow-Hill, New York, 2000.
4. R. Scitovski, Numerička matematika, University of Osijek, 2005.

J. Šribar, B. Motik: Demistificirani C++, Element, 2010.