

I005	Obligatory - Semester 9	<b>Teaching Informatics</b>	L+P+S 2+1+0	ECTS 4
------	-------------------------	-----------------------------	----------------	-----------

**Course objectives.** Introduce students to recent approaches to the organization of teaching, teaching aids and practice in realization of teaching informatics. Train students, future mathematics and informatics teachers, to recognize student's interests, abilities and problems. Prepare students for work with advanced students and students with problems in learning informatics.

**Course prerequisites.** Introduction to Computer Science, Introduction to Programming.

### Syllabus.

1. Introduction. Basic questions in methods - organization of teaching, educational aids and methods for preparation and realization of teaching. Connection of methods with didactics - educational contents and thematic units, scopes, manner of demonstration and required precognition.
2. Problems in teaching informatics. Comprehensive presentation of educational contents of informatics and division into thematic units. Rate of modification and acuteness as a basic characteristic of computer technologies. Influence of methodical and didactic forms from other educational areas on teaching informatics and procedures for their mitigation. New directions of development of the educational program in informatics.
3. Methods in education of informatics. Planning of educational materials and order of realization. Structures and types of educational lessons. Approach to realization of education. Animation of students. Principles of didactics theory and application in education of informatics. Cybernetic methods. Heuristic, programming education and education with problems. Analysis and synthesis, analogy, algorithms, approaches to problem solving. Adjustment of computer contents and available educational materials to psychology and age of respective students. Requests and form of the training of teachers to realization of teaching informatics. Analysis of the educational lesson. Monitoring progression and talent of students. Procedures of testing the acquired knowledge. Substantive student work.
4. Conceiving conditions of realization of teaching informatics. Connection of educational contents, aids and methods of realization of teaching. Qualification of a teacher for keeping up-to-date with fast changes in educational contents and methods of realization of teaching. Literature for preparation of teaching. Equipment for teaching informatics. Computer as the teaching equipment. Program packages for preparation, demonstration and distribution of educational contents and monitoring of success. Internet technology in teaching informatics.
5. Customization of methodical and didactics principles to educational areas in informatics. Usage of computers and the Internet as educational aids. Preparation of educational materials on a computer with the ability of demonstration by means of presentation equipment or adequate environment. Theoretic introduction, deepening of knowledge, examples, problems and solutions are the basis of analysis of all educational areas in informatics. Computer system and personal computer. Computer network and the Internet. A cybernetic and a heuristic approach to examples. Development and basis of working on a computer from computer animation. Demonstration basis from logic, the structure of computers and data in computer by analogical models and simulation programs. An algorithmic method of thinking. Programming language of appropriate level of complexity. Programming solutions of basic problems with computer. Independent or team use of a computer in problem solving (depending on age).

### Expected learning outcomes:

After completing the course, students are expected to:

- use computers and adequate program packages needed for teaching informatics;
- present, listen and analyze high-school lectures;
- discuss problems and particularities in teaching informatics;
- explore possibilities of using informatics in the educational process;
- revise their personal and professional experience;
- use literature from field of teaching methods with emphasis on teaching informatics.

**Teaching methods and student assessment.** Lectures and exercises are obligatory. Lectures are performed partially in cooperation with high schools. Students are obliged to attend and analyze educational lectures given by their high-school mentors in cooperation with their lecturer in this course. Students can improve their final grades by writing a seminar paper during the semester.

**Can the course be taught in English:** Yes.

**Basic literature:**

1. V. Galešev et al., Informatika i računarstvo: metodički priručnik za nastavnike, SysPrint, Zagreb, 2006.

**Recommended literature:**

1. L. Cassel, R. Reis, Informatics Curricula and Teaching Methods, Kluwer Academic Publishers, 2003.
2. M. Pavleković, Metodika nastave matematike s informatikom I i II, Element, Zagreb,(1997),(1999)
3. G. Martinović, Reviewed course materials for primary and secondary schools.
4. L. Budin, Informatika za 1. razred gimnazije, Element, Zagreb, 1996.