# Computing – 4 semester

| Lp. | Subject | Description | Semester | ECTS credits | Number of hours for the form of education | | | | | | Form of passing | |
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| | | | | | Lecture | Exercise | Practical classes | ZK | PS | PZ | Exam | Credit |
| 1. | Operational research | Students become familiar with the theory and basic methods of operations research. They will acquire the skills to correctly classify and formulate selected, real decision-making (optimization) problems and task scheduling problems.They will be able to choose a method or an appropriate algorithm to solve the formulated problem. | 4 | 4 | 30 | - | 30 | | | | x | x |
| 2. | Optimization methods | Students become familiar with advanced optimization problems and methods. They will be able to choose a method or an appropriate algorithm to solve the formulated problem. | 4 | 4 | 30 | - | 30 | | | | x | x |
| 3. | Engineering and scientific calculations | Providing students with basic knowledge of IT tools used for calculations in science and in engineering. Developing students' skills in defining and solving simple technical computational problems. | 4 | 3 | 15 | - | 30 | | | | - | x |
| 4. | Computer simulation | Providing students with basic knowledge in the field of modeling and simulation of continuous, discrete and discrete-continuous processes. Developing students' skills | 4 | 3 | 15 | - | 30 | | | | - | x |

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| | | in planning and automatic implementation of simple simulation experiments. | | | | | | | | | | | |
| 5. | Basics of automation | Providing students with basic knowledge in the description of the dynamics of objects in the time, operator and frequency domain. Developing students' skills in solving simple problems of identifying objects and designing systems control. | 4 | **3** | 15 | 15 | 30 | | | | | - | x |
| 6. | Internet applications I | Familiarization with the basics of hypertext markup language. Using basic HTML elements. Applying a CSS stylesheet. | 4 | **3** | 15 | 30 | 15 | | | | | - | x |
| 7. | Software Engineering I | Learning the principles and methods of software development in a systematic way. The student acquires the skills of: using design patterns; software design in accordance with structured methodology. Reviewing the software design. | 4 | **3** | 30 | - | 30 | | | | | - | x |
| 8. | Database systems I | Familiarizing students with modern database technologies, presenting practical and theoretical aspects of database systems. Development of skills: modeling of IT systems; preparing a relational database schema for based on the entity-relationship model. Practical learning of SQL (Structured Query Language), formulating queries in SQL - creating transactions. | 4 | **3** | 30 | - | 15 | | | | | x | x |

| 9. | Operating systems II | Familiarization with aspects of process synchronization. Presentation of aspects of system and concurrent programming in the POSIX standard on the example of a Linux operating system. Discussion of the security aspects of the operating system and the specificity of OS used in IoT. | 4 | **3** | 30 | - | 30 | | | | x | x |
|----|----------------------|---|---|---|---|---|---|---|---|---|---|---|
| 10. | Professional practice II | Professional practice in real IT companies. Learn daily IT jobs in practice, solve real IT Problems in companies. | 4 | **8** | - | - | 240 | | | | - | x |
| | **Total:** | | | **37 ECTS** | | | | | | | | |