Study program: Modern computer technologies

Course title: Algorithms and Data Structures

Professor/assistant: Slavimir N. Stošović

Type of course: compulsory

ECTS credits: 6

Pre-requisites: none

Aims of the course:
To prepare students to:
- understand basic concepts related to creating and presenting algorithms,
- solve engineering problems algorithmically,
- independently construct, perform and test algorithms using basic and advanced data structures,
- perform and apply internal data structures, control structures of algorithm flow, as well as principles of modular programming,
- analyze the complexity of algorithms and optimize them accordingly.

Learning outcomes:
By mastering the subject, a student will be able to:
- understand, formulate and present basic linear, branched and cyclic algorithmic structures,
- analyze, define and construct a solution of a problem in the form of an algorithm,
- select and apply the appropriate data structure for problem solving,
- evaluate and perform an analysis of the complexity of the algorithm and notice the difference in the complexity of multiple algorithms,
- optimize the algorithm, that is, the solution to the problem, if necessary.

Syllabus

Theoretical part


Practice, other forms of study and research work

Practical classes follow theoretical units by solving concrete examples and tasks.

Literature

Number of active classes

<table>
<thead>
<tr>
<th>Lectures: 30</th>
<th>Practical classes: 30</th>
<th>Research work:</th>
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</thead>
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Other forms of teaching:

Teaching methods
Theoretical and practical teaching in combination with interactive teaching with practical problem solving.

Grading system (maximum 100 points), grading scale from 5 to 10: below 51 points grade 5, grade 6 from 51-60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91-100 points.

<table>
<thead>
<tr>
<th>Pre-exam obligations</th>
<th>points</th>
<th>Final exam</th>
<th>points</th>
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<tbody>
<tr>
<td>activity during theoretical lectures</td>
<td>10</td>
<td>written exam</td>
<td>20</td>
</tr>
<tr>
<td>practical training</td>
<td>20</td>
<td>oral exam</td>
<td>10</td>
</tr>
<tr>
<td>colloquium(s)/seminar papers</td>
<td>40</td>
<td></td>
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<tr>
<td>Sum</td>
<td>70</td>
<td>Sum</td>
<td>30</td>
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