



UNIVERSITY OF PRIZREN
FACULTY OF COMPUTER SCIENCE

PROGRAM: SD

| Curriculum - – SYLLABUS | | | | | | | |
|--------------------------------|--|------------------------------|------------|-----------------------|-------------------------------|---------------------|------------------|
| <i>Level of studies</i> | BACHELOR | <i>Program</i> | SD | <i>Academic year</i> | 2017/2018 | | |
| SUBJECT | Algorithms and Data structures | | | | | | |
| <i>Year</i> | II | <i>Status Of the subject</i> | Obligatory | <i>Code</i> | 303 | <i>ECTS credits</i> | 6 |
| <i>Semester</i> | III | | | | | | |
| <i>Teaching weeks</i> | 15 | | | <i>Hours teaching</i> | 45 | <i>Lectures</i> | <i>Exercises</i> |
| | | | 2 | | | 2 | |
| <i>Teaching Methodology</i> | Lectures, exercises, seminar papers, consultations, tests. | | | | | | |
| <i>Consultation</i> | One hour / week | | | | | | |
| <i>The teacher</i> | Prof.Ass. Ercan Canhasi | | | <i>E-mail:</i> | ercan.canhasi@uni-prizren.com | | |
| | | | | <i>Tel.:</i> | 045 542 501 | | |
| <i>Assistant</i> | Msc. Selman Jagxhiu | | | <i>E-mail:</i> | | | |
| | | | | <i>Tel.:</i> | | | |

| Study goal and table of content | Benefits of student |
|--|--|
| <p>The objective of the course is to give the students opportunity to define, understand, apply, analyze, evaluate and create ideas on wide range of introductory concepts about fundamental algorithms such as search, sort, traversal algorithms and fundamental data structures, linear lists, queues, stacks, sort algorithms, search algorithms, hashes, trees, graphs, and formal characteristics of algorithms, identification of efficiency,</p> | <p>After the course, each student is expected to be able to: have an overview on fundamental data structures and algorithms; use linear lists, queues, sort algorithms, search algorithms, tree, graphs to implement programs with efficient algorithms.</p> <p>Students will be able to explain the application of data structures.</p> <p>Students will understand and compare the benefits and cost of dynamic and static structures.</p> <p>Students will be able to properly select the data structures for modeling a problem.</p> <p>Students will be able to calculate which algorithm will be more efficient from the aspect of time and quantum (aspect of memory) for a problem, by a set of algorithms.</p> <p>Students will be able to analyze the complexity of an algorithm for a given implementation.</p> |

| Methodology for the implementation of educational topics: | | |
|---|-----------------------|---|
| This is a combined course with lectures, discussions, conversations, practical work, exercises, workshops, seminars, task in which subjects are presented by professor of course and assistant in the laboratory. | | |
| Conditions for realization of educational topics: | | |
| <ul style="list-style-type: none"> • Adequate literature, table, computer, projector and other necessary IT tools for learning and exercises. | | |
| Ways of assessing of the student (in %) : | Evaluation in% | Final grade |
| A seminar paper | 10.00 % | 51-60% - grade 6 61-70 7 71-80 8 81-90 9 91-100 10 |
| Colloquia | 30.00 % | |
| Final test | 60.00 % | |
| Final Exam included three evaluation criteria; | 10 + 30 + 60 | |
| Total | 100.00 % | |

| Obligations of student: | | | | |
|---|--|---|--|-------------|
| Lectures | | Exercises | | |
| The student must be regular lectures and exercises, to use all possibilities for learning the knowledge required to use literature and wider, to be active and keep regulations on higher education in ethics and courtesy for cooperation. | | The student must be active and reflective exercises and knowledge readiness initiatives, ideas and demonstration of knowledge gained in lectures. | | |
| Student workload for Subject | | | | |
| Activities | Hour/ weeks | Days/Weeks | Total | |
| Lectures | 2 | 15 | 30 | |
| Laboratory exercises | 2 | 15 | 30 | |
| Contacts with teachers / consultations | 0.5 | 15 | 7.5 | |
| Practical work | 1 | 2 | 2 | |
| Projects, presentations, etc. | 1 | 2 | 2 | |
| Own study time | 3 | 10 | 30 | |
| Preparation for final exam | 3 | 5 | 15 | |
| Time spent in the assessment (tests, final exam, etc.) | 2 | 3 | 6 | |
| Notice: 1 ECTS credits= 25 hour commitment, e.g. if the subject has 6 ECTS credits student must have 150 hours during the semester commitment. | | Total load: | 120 | |
| Week | Lectures | Hour | Exercises | Hour |
| | Topic | | Topic | |
| 1-2 | <ul style="list-style-type: none"> Introduction to Algorithms and data structures. What are the algorithms and data structures, the relation among them and why are they so important. | 4 | <ul style="list-style-type: none"> Introduction to Algorithms and data structures. What are the algorithms and data structures, the relation among them and why are they so important. | 4 |
| 3 | Arrays and Linked Lists | 2 | Arrays and Linked Lists | 2 |
| 4 | Stack, its implementation with arrays and linked lists | 2 | Stack, its implementation with arrays and linked lists | 2 |
| 5 | Queue, its implementation with arrays and linked lists | 2 | Queue, its implementation with arrays and linked lists | 2 |
| 6-7 | Tree and Graphs, its implementation with arrays and linked lists | 4 | Tree and Graphs, its implementation with arrays and linked lists | 4 |
| 8 | The first Intermediate exam | 2 | The first Intermediate exam | 2 |
| 9-10 | Algorithms, complexity, complexity calculation, recursion, comparison of different methods and techniques of their design. | 4 | Algorithms, complexity, complexity calculation, recursion, comparison of different methods and techniques of their design. | 4 |
| 11 | Search Algorithms, sequential and binary search | 2 | Search Algorithms, sequential and binary search | 2 |
| 12-13 | Sort Algorithms | 4 | Sort Algorithms | 4 |

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|------|------------------------------|---|------------------------------|---|
| 14 | Tree and Graph Algorithms | 2 | Tree and Graph Algorithms | 2 |
| 9-10 | The second Intermediate exam | 4 | The second Intermediate exam | 4 |

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| LITERATURE: | | | | |
| <p>Basic Literatur :</p> <ul style="list-style-type: none"> • Introduction to Algorithms; Book by Charles E. Leiserson, Clifford Stein, Ronald Rivest, and Thomas H. Cormen • Data Structures and Algorithm Analysis in Java, Book by Mark Allen Weiss | | | | |
| NOTICE: | | | | |
| <ul style="list-style-type: none"> • In general presentations of lectures will be made through Power Point system, table, use of materials and computer software and the Internet. • Also, the professor will be provided additional materials (papers, publications, national bulletins and sound research findings and final). • In the absence of the possibility that practical work is organized every week, in cooperation with the management of the University, this activity will be organized on certain days, organizations, companies, farms, processing manufacturing unit. • During each session, will be organized conversations with students. | | | | |
| Notice for the student: | | | | |
| <ul style="list-style-type: none"> <input type="checkbox"/> The students are required to be regular in the lectures and exercises. <input type="checkbox"/> The contribution of the students in the form of conversation with the students will be evaluated. <input type="checkbox"/> Arrival time at lectures and exercises is mandatory. | | | | |