

Content

| Course Code | Course Name | Semester | Theory | Practice | Lab | Credit | ECTS |
|-------------|--|----------|--------|----------|-----|--------|------|
| MAT232 | Algorithms and Advanced Programming II | 4 | 3 | 3 | 0 | 3 | 3 |

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| Prerequisites | |
| Admission Requirements | |

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| Language of Instruction | |
| Course Type | Compulsory |
| Course Level | Bachelor Degree |
| Objective | The purpose of this course is to improve students understanding of algorithm design and analysis by studying algorithms working on more complex data structures. |
| Content | <ol style="list-style-type: none">1. Introduction to object-oriented programming - Basic Concepts2. Trees and tree hopping3. AVL Trees4. Splay Trees5. Max and Min Stack Trees6. MultiWays Tree7. Graphs and Entanglement Algorithms8. Minimum Spanning Tree9. Graph algorithms (shortest path, all pairs shortest path, Djikstra's algorithm)10. Coloring of graphs, matrix representation, conversion between representations in the form of matrices and objects11. Character Sequence Algorithms (search in character sequence, longest common substring)12. Reference behavior, value behavior, shallow/deep copy |
| References | <p>The Art of Computer Programming, Addison-Wesley, Donald Knuth Algorithms, 4th Ed. Robert Sedgewick</p> <p>Lafore, R., Broder, A., & Canning, J. (2022). Data Structures and Algorithms in Python. Pearson Education, Limited.</p> <p>Agarwal, B., & Baka, B. (2018). Hands-On Data Structures and Algorithms with Python: Write complex and powerful code using the latest features of Python 3.7. Packt Publishing Ltd.</p> <p>www.geeksforgeeks.org</p> |

Theory Topics

| Week | Weekly Contents |
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