

## Content

| Course Code | Course Name                            | Semester | Theory | Practice | Lab | Credit | ECTS |
|-------------|--|----------|--------|----------|-----|--------|------|
| MAT232      | Algorithms and Advanced Programming II | 4        | 1      | 1        | 1   | 3      | 3    |

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|------------------------|--|
| Prerequisites          |  |
| Admission Requirements |  |

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| Language of Instruction | French   |
| 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"><li>1. Introduction to object-oriented programming - Basic Concepts</li><li>2. Trees and tree hopping</li><li>3. AVL Trees</li><li>4. Splay Trees</li><li>5. Max and Min Stack Trees</li><li>6. MultiWays Tree</li><li>7. Graphs and Entanglement Algorithms</li><li>8. Minimum Spanning Tree</li><li>9. Graph algorithms (shortest path, all pairs shortest path, Djikstra's algorithm)</li><li>10. Coloring of graphs, matrix representation, conversion between representations in the form of matrices and objects</li><li>11. Character Sequence Algorithms (search in character sequence, longest common substring)</li><li>12. Reference behavior, value behavior, shallow深深 copy</li></ol> |
| References              | <p>The Art of Computer Programming, Addison-Wesley, Donald Knuth Algorithms, 4th Ed. Robert Sedgewick</p> <p>Lafore, R., Broder, A., &amp; Canning, J. (2022). Data Structures and Algorithms in Python. Pearson Education, Limited.</p> <p>Agarwal, B., &amp; 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><a href="http://www.geeksforgeeks.org">www.geeksforgeeks.org</a></p>  |

## Theory Topics

| Week | Weekly Contents |
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