Content

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

Prerequisites	
Admission Requirements	

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	1. Introduction to object-oriented programming - Basic Concepts 2. Trees and tree hopping 3. AVL Trees 4. Splay Trees 5. Max and Min Stack Trees 6. MultiWays Tree 7. Graphs and Entanglement Algorithms 8. Minimum Spanning Tree 9. 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 objects 11. Character Sequence Algorithms (search in character sequence, longest common substring) 12. Reference behavior, value behavior, shallow/deep copy
References	The Art of Computer Programming, Addison-Wesley, Donald Knuth Algorithms, 4th Ed. Robert Sedgewick Lafore, R., Broder, A., & Canning, J. (2022). Data Structures and Algorithms in Python. Pearson Education, Limited. 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. www.geeksforgeeks.org

Theory Topics

Week	Weekly Contents