

Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT232	Algorithms and Advanced Programming II	4	3	0	0	3	5

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	
References	The Art of Computer Programming - Donald Knuth Data Structures and Algorithms Using Python - Rance D. Necaise Data Structures and Algorithms with Object-Oriented Design Patterns in Python - Bruno R.Preiss

Theory Topics

Week	Weekly Contents
1	Value Behaviour vs Reference Behaviour, Pass by value vs Pass by reference
2	Object oriented programming: Object, Class, Instance
3	Vertices and edges of graphs as object instances and references
4	Breadth/Depth first search on a graph
5	Shortes path problem, Dijkstra's algorithm
6	Minimum spanning tree, Kruskal algorithm
7	Midterm
8	Random number generators: Linear congruential generator, Lagged fibonacci generator
9	Levenshtein edit distance for strings