
EFFICIENT ALGORITHMS in Spring 2021 (CS3046)

Course Code	CS3046	Professor(s)	Antonio Kung
Prerequisites	None	Office Number	
Class Schedule	MW: 09:00-10:20 in Q-604	Office Hours	By appointment
Credits	4	Email	akung@aup.edu
Semester	Spring 2021	Office Tel. Ext.	0680784872

Course Description

This course aims to develop the student's skill in devising combinatorial algorithms and in analysing their behavior in order to achieve good asymptotic performances.

.An introduction on formal systems will be given. Turing machines and non deterministic Turing machines will be covered in particular. Elements of the theory of computation will be explained (e.g. non solvable problems, NP-complete problems). Sorting problems, searching problems, balanced trees, string processing problems, graph problems and geometric problems will be examined.

Upon completing this course students should be able to:

- Have a basic understanding of theory of computation
- Have an understanding of the design of algorithms
- Have been exposed to a wealth of computer science algorithms

Course Learning Outcomes

Have a basic understanding of theory of computation.

Have an understanding of the design of algorithms.

Have been exposed to a wealth of computer science algorithms.

General Education

Course Outline

CS3046-1 Introduction
CS3046-2 Turing machines
CS3046-3 Acceptability Decidability
CS3046-4 Intro algorithms
CS3046-5 Union-find
CS3046-6 Elementary sort - merge sort
CS3046-7 Distribution counting
CS3046-8 Non deterministic turing machines
CS3046-9 Non deterministic algorithms
CS3046-10 Implementation of the TSP
CS3046-11 Priority queues - heap sort
CS3046-12 Symbol table
CS3046-13 Binary Search Trees (BST)
CS3046-14 Balanced Trees
CS3046-15 Hash tables
CS3046-16 Undirected Graphs
CS3046-17 External search
CS3046-18 Digraphs
CS3046-19 Minimum spanning trees
CS3046-20 Shortest path
CS3046-21 String sort
CS3046-22 Tries and patricia trees
CS3046-23 Substring search
CS3046-24 Regular expression pattern matching
CS3046-25 Data compression

Textbooks

This course doesn't have any textbook.

Attendance Policy

Students studying at The American University of Paris are expected to attend ALL scheduled classes, and in case of absence, should contact their professors to explain the situation. It is the student's responsibility to be aware of any specific attendance policy that a faculty member might have set in the course syllabus. The French Department, for example, has its own attendance policy, and students are responsible for compliance. Academic Affairs will excuse an absence for students' participation in study trips related to their courses.

Attendance at all exams is mandatory.

IN ALL CASES OF MISSED COURSE MEETINGS, THE RESPONSIBILITY FOR COMMUNICATION WITH THE PROFESSOR, AND FOR ARRANGING TO MAKE UP MISSED WORK, RESTS SOLELY WITH THE STUDENT.

Whether an absence is excused or not is ALWAYS up to the discretion of the professor or the department. Unexcused absences can result in a low or failing participation grade. In the case of excessive absences, it is up to the professor or the department to decide if the student will receive an "F" for the course. An instructor may recommend that a student withdraw, if absences have made it impossible to continue in the course at a satisfactory level.

Students must be mindful of this policy when making their travel arrangements, and especially during the Drop/Add and Exam Periods.

Grading Policy

Homework assignments 35%

Mid-term examination 15%

Class participation 10%

Final examination 15%

Programming project 25%

Other
