FLORIDA ATLANTIC UNIVERSITY

COURSE CHANGE REQUEST
Graduate Programs

Department Electrical Engineering and Computer Science

College Engineering and Computer Science

UGPC Approval _____
UFS Approval _____
SCNS Submittal _____
Confirmed _____
Banner _____
Catalog _____

***Current* Course Prefix and Number**	***Current* Course Title**
COT 6405	Analysis of Algorithms

*Syllabus must be attached for **ANY** changes to current course details. See Template. Please consult and list departments that may be affected by the changes; attach documentation.*

Change title to:

Change prefix

From: **To:**

Change course number

From: **To:**

Change credits*

From: **To:**

Change grading

From: **To:**

Academic Service Learning (ASL) **

Add ☐ **Remove** ☐

* See Definition of a Credit Hour.
** Academic Service Learning statement must be indicated in syllabus and approval attached to this form.

Change description to:

Design and analysis of algorithms from several areas of computer science. Topics include divide and conquer, maximum flow, dynamic programming, greedy algorithms, NP-completeness and approximation algorithms.

Change prerequisites/minimum grades to:

COP 3530 or COP 3410 or permission of instructor

Change corequisites to:

Change registration controls to:

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.

Effective Term/Year for Changes: Fall 2023

Terminate course? Effective Term/Year for Termination:

Faculty Contact/Email/Phone Hanqi Zhuang / zhunag@fau.edu / 561-297-3413

Approved by	***Date***
Department Chair	11/28/2022
College Curriculum Chair — Francisco Presuel-Moreno (Digitally signed by Francisco Presuel-Moreno, DN: cn=Francisco Presuel-Moreno, o, ou, email=fpresuel@fau.edu, c=US, Date: 2022.11.28 13:51:44 -05'00')	11/28/2022
College Dean — Mihaela Cardei (Digitally signed by Mihaela Cardei)	11/28/2022
UGPC Chair — Mihaela Cardei (Dec 19, 2022 10:21 EST)	Dec 19, 2022
UGC Chair	Dec 19, 2022
Graduate College Dean	Dec 19, 2022
UFS President	
Provost	

Email this form and syllabus to UGPC@fau.edu 10 days before the UGPC meeting.

COT 6405
ANALYSIS OF ALGORITHMS
3 credits

Fall 2023

Professor: Dr. Mihaela Cardei
Office: EE96, Room 308N
Office Hours: TBA
Telephone: 561-297-3459
Email: mcardei@fau.edu

Course Description
Design and analysis of algorithms from several areas of computer science. Topics include divide and conquer, maximum flow, dynamic programming, greedy algorithms, NP-completeness and approximation algorithms.

Instructional Method
A brief statement about the Instructional Method and the expectations for student attendance in the class will be included here. For a list of the Instructional Methods and their definitions, see https://www.fau.edu/registrar/courses/Instru_Method.php

Prerequisites
COP 3530 or COP 3410 or permission of instructor

Course Objectives/Student Learning Outcomes
Course objectives (CO)
Upon successful completion of this course, students will be able to:

1. Design algorithms using pseudocode. (CO: 1)
2. Analyze expressions, pseudocode, and algorithms using asymptotic notations. (CO: 2)
3. Solve recurrences using Master's Theorem, backward substitution, and forward substitution. (CO: 3)
4. Apply representative algorithmic techniques: brute force, divide-and-conquer, backtracking, branch-and-bound, linear programming, greedy algorithms, dynamic programming, and maximum flow. (CO: 4)
5. Analyze data structures and the running time of their operations using asymptotic notations. (CO: 5)
6. Classify problems into classes P, NP, and NP-complete. (CO:6)
7. Apply reducibility method to NP-complete problems. (CO:7)
8. Solve hard problems using approximation algorithms. (CO:8)

Course Evaluation Method

5 Homework (15% each) – 75%
Class Participation – 5%
Programming Project – 20%

Course Grading Scale

[90, 100] A, [85, 90) A – , [80, 85) B +, [75, 80) B, [70, 75) B –, [67, 70) C +, [63, 67) C, [60, 63) C –, [57, 60) D +, [53, 57) D, [50, 53) D –, [0 – 50) F.

Policy on Makeup Tests, Late Work, and Incompletes (if applicable)

- Late work is not acceptable.
- *Grades of Incomplete ("I")* are reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances. If you have solid evidence of medical or otherwise serious emergency, please contact the instructor as soon as possible to discuss the possibility of an Incomplete grade.
- No extra work or bonus problems/assignments will be assigned to improve the course grade. All assignments will be counted in the final grade.

Special Course Requirements (if applicable)

NA

Classroom Etiquette Policy (if applicable)

NA

Policy on the Recording of Lectures

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

Attendance Policy

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work

missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/

Disability Policy

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

Code of Academic Integrity

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

Required Texts/Readings

No required textbooks.

Supplementary/Recommended Readings (if applicable)

- *Introduction to Algorithms*, 3rd edition, by T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, The MIT Press, 2009, ISBN: 0262033844
- *Algorithm Design*, J. Kleinberg and E. Tardos, Addison Wesley, 2006.
- *The Design & Analysis of Algorithms*, 2nd edition, A. Levitin, Addison Wesley, 2007.
- *Algorithms*, R. Johnsonbaugh and M. Schaefer, Pearson Education 2004.

- *Fundamentals of Algorithms,* G. Brassard and P. Bratley, Prentice Hall 1996.

Course Topical Outline

1. Foundations of Algorithm Design and Analysis
2. Advanced Data Structure: B-Trees
3. Brute Force & Exhaustive Search
4. Backtracking & Branch and Bound
5. Divide and Conquer
6. Maximum Flow and Extensions
7. Linear Programming
8. Greedy Algorithms
9. Dynamic Programming
10. NP-Completeness
11. Approximation Algorithms