COURSE CHANGE REQUEST
Graduate Programs

FLORIDA ATLANTIC UNIVERSITY

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 6446	Randomized 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:

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:	**Terminate course? Effective Term/Year for Termination:**
Fall 2023	

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

Approved by	***Date***
Department 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 13:50:46 -05'00')	11/28/2022
College Curriculum Chair Mihaela Cardei (Digitally signed by Mihaela Cardei, DN: cn=Mihaela Cardei, o=Florida Atlantic University, ou, email=mcardei@fau.edu, c=US, Date: 2022.11.28 14:03:04 -05'00')	11/28/2022
College Dean	11/28/2022
UGPC Chair	
UGC Chair	
Graduate College Dean	
UFS President	
Provost	

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

COT 6446
RANDOMIZED ALGORITHMS
3 credits

Fall 2023

Professor: Dr. Feng-Hao Liu
Office: EE96, Room 412
Office Hours: TBA
Telephone: 561-297-2341
Email: fenghao.liu@fau.edu

Course Description
This course introduces several basic techniques in the design and analysis of randomized algorithms and their applications.

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 learn the power of randomness in computer science, and how to design and analyze randomized algorithms:

1. An ability to identify, formulate, and solve complex computing/engineering problems by applying principles of computing, engineering, science, and mathematics.
2. An ability to apply the computing/engineering design process to produce solutions that meet a given set of computing/engineering requirements with consideration for public health and safety, and global cultural, social, environmental, economic, and other factors as appropriate to the discipline.
3. An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge.

Course Evaluation Method
5 Homework Assignments (each worth 14%) – 70%
Final Examination or Project – 30%

For the project, students must first identify a related topic, either from the textbook or research papers, and get approved by the instructor. Then they should present the essential/novel ideas and technical contributions. Students should submit a final report for the project.

Course Grading Scale

90 and above: “A”, 87-89: “A-“, 83-86: “B+”, 80-82: “B”, 77-79 : “B-“, 73-76: “C+”, 70-72: “C”, 67-69: “C-“, 63-66: “D+”, 60-62: “D”, 51-59: “D-“, 50 and below: “F.”

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

Students are strongly suggested to inform the instructor in advance in the case of emergency (if possible). Makeup exams are given only if there is solid evidence of a medical or otherwise serious emergency that prevents the student of participating in the exam.

Students must turn in homework, assignment and projects on time. Students will lose 25% (after 1 day) and 50% of marks (after 2 days) if they turn in late. Submissions are not accepted after 2nd day of due date.

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

Probability and Computing: Randomization and Probabilistic Techniques in Algorithms and Data Analysis 2nd Edition
By Michael Mitzenmacher and Eli Upfal. Cambridge University

Supplementary/Recommended Readings (if applicable)

NA

Course Topical Outline

Weekly Schedule	Topics
Week 01	Introduction: the power of randomness in computer science
Week 02	Background of (discrete) probability: random variables, expectations, applications to Quicksort HW1
Week 03	Applications to Coupon Collection Problems and Stable matching.
Week 04	Chebyshev's Inequality and applications to Find Medium HW2
Week 05	Chernoff Bounds and Applications to Parameter Testing
Week 06	Chernoff Bounds and Applications to Error Reduction
Week 07	Hash Functions, Pairwise Independence, and applications to randomness efficient designs HW3
Week 08	Cryptographic Applications I: semantic security, collision resistance, computational indistinguishability, and pseudorandomness
Week 09	Cryptographic Applications II: interactive proofs, zero-knowledge proofs, Project Topic Selection
Week 10	Cryptographic Applications III: secure multiparty computation,Ideal-Real paradigm
Week 11	The probabilistic method, an introduction HW4
Week 12	The probabilistic method, applications
Week 13	Random Process, an introduction
Week 14	Random Process, applications HW5
Week 15	Other selected topics Project presentation and reports submission