



FLORIDA ATLANTIC UNIVERSITY

COT 6405-001 11375

Analysis of Algorithms

Date: Friday 2:00 PM - 3:20 PM

Building: General Classroom South Boca **Room:** 118

3 Credit(s)

Spring 2025 - 1 Full Term

Instructor Information

Mihaela Cardei

Email: mcardei@fau.edu

Office: EE96, Room 414

Instructor Office Hours: Thursdays 11:00 AM - 1:00 PM (in-person and on Zoom)

Phone: 561-297-3459

The instructor for the course is Dr. Mihaela Cardei, Professor in the EECS Department, College of Engineering and Computer Science.

TA Name: Anca Muresan

Office Hours: Mondays 10:00 - 11:00 AM (on Zoom)

Email: amuresan2023@fau.edu

Course Description

Analysis of Algorithms

Prerequisite: Graduate standing with major in Artificial Intelligence, Computer Engineering or Computer Science, or permission of instructor

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

Attendance Requirement

Students must take the **Midterm Exam** and the **Final Exam** in person, at the Boca Raton campus. On campus attendance is mandatory for the two exams:

- The **Midterm Exam** is on Friday February 28, between 2:00 - 3:20 PM
- The **Final Exam** is on Friday April 18, between 2:00 - 3:20 PM

Instructional Method

Mixed Online and Classroom

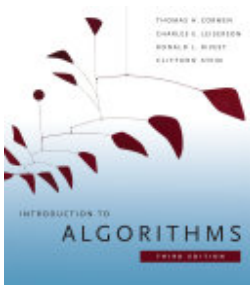
50%-79% of the course is delivered online. (Hybrid)

Required Texts/Materials

No Required Textbook

No Required Textbook

Recommended Readings and Materials



Introduction to Algorithms (third or fourth edition)

ISBN: 9780262258104

Authors: Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein

Publisher: MIT Press

Publication Date: 2009-07-31

Algorithm Design

Authors: J. Kleinberg and E. Tardos

Publisher: Addison Wesley

Publication Date: 2006

The Design and Analysis of Algorithms

Authors: A. Levitin

Publisher: Addison Wesley

Publication Date: 2007

Edition: 2nd edition

Algorithms

Authors: R. Johnsonbaugh and M. Schaefer
Publisher: Pearson Education
Publication Date: 2004

Fundamentals of Algorithms

Authors: G. Brassard and P. Bratley
Publisher: Prentice Hall
Publication Date: 1996

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)

Faculty Rights and Responsibilities

Florida Atlantic University respects the rights of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise. To ensure these rights, faculty members have the prerogative to:

- Establish and implement academic standards.
- Establish and enforce reasonable behavior standards in each class.
- Recommend disciplinary action for students whose behavior may be judged as disruptive under the Student Code of Conduct [University Regulation 4.007](#).

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/.

Course Evaluation Method

3 Homeworks (10% each) - 30%

Midterm Exam - 25%

Final Exam - 25%

Programming Project - 20%

Note: The Midterm Exam (February 28) and the Final Exam (April 18) are in-person, at the Boca Raton Campus. The in-person attendance is mandatory.

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](#).

Attendance Policy Statement

Students are expected to attend all 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.

Attendance Requirement

Students must take the Midterm Exam and the Final Exam in person, at the Boca Raton campus. On campus attendance is mandatory for the two exams:

- The Midterm Exam is on Friday February 28, between 2:00 - 3:20 PM
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Religious Accommodation Policy Statement

In accordance with the rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs regarding admissions, registration, class attendance, and the scheduling of examinations and work assignments. University Regulation 2.007, Religious Observances, sets forth this policy for FAU and may be accessed on the FAU website at www.fau.edu/regulations.

Any student who feels aggrieved regarding religious accommodations may present a grievance to the executive director of The Office of Civil Rights and Title IX. Any such grievances will follow Florida Atlantic University's established grievance procedure regarding alleged discrimination.

Time Commitment Per Credit Hour

For traditionally delivered courses, not less than one (1) hour of classroom or direct faculty instruction each week for fifteen (15) weeks per Fall or Spring semester, and a minimum of two (2) hours of out-of-class student work for each credit hour. Equivalent time and effort are required for Summer Semesters, which usually have a shortened timeframe. Fully Online courses, hybrid, shortened, intensive format courses, and other non-traditional modes of delivery will demonstrate equivalent time and effort.

Course Grading Scale

Letter Grade	Letter Grade
A	[90 - 100]%
A-	[85 - 90)%
B+	[80 - 85)%

Letter Grade	Letter Grade
B	[75 - 80)%
B-	[70 - 75)%
C+	[67 - 70)%
C	[63 - 67)%
C-	[60 - 63)%
D+	[57 - 60)%
D	[53 - 57)%
D-	[50 - 53)%
F	Below 50

Grade Appeal Process

You may request a review of the final course grade when you believe that one of the following conditions apply:

- There was a computational or recording error in the grading.
- The grading process used non-academic criteria.
- There was a gross violation of the instructor's own grading system.

[University Regulation 4.002](#) of the University Regulations contains information on the grade appeals process

Policy on Make-up Tests, Late work, and Incompletes

- Midterm and Final exams must be taken by all students on the specified days.
- Homeworks & project: I strongly encourage you to submit your work before the deadline. Late work submitted within 24 hrs of the deadline receives 10% grade penalty. Late work received within 48 hrs of the deadline receives 20% grade penalty. No late work is accepted 48 hrs after the deadline.
- 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

Students must be able to access the course material on Canvas and submit the homework and project on Canvas. Homework and project submissions by email, hardcopy, or other means are not accepted.

After the grades are posted, students have a few days to review their grades and ask questions about their grades. The exact period of time is posted on Canvas in the Announcements section. Any questions about grades and homework/exam/project will not be addressed outside of the allocated time period

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.

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 therapy, group therapy, and crisis services, to name a few - offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

Student Support Services and Online Resources

- [Center for Learning and Student Success \(CLASS\)](#)
- [Counseling and Psychological Services \(CAPS\)](#)

- [FAU Libraries](#)
- [Math Learning Center](#)
- [Office of Information Technology Helpdesk](#)
- [Center for Global Engagement](#)
- [Office of Undergraduate Research and Inquiry \(OURI\)](#)
- [Science Learning Center](#)
- [Speaking Center](#)
- [Student Accessibility Services](#)
- [Student Athlete Success Center \(SASC\)](#)
- [Testing and Certification](#)
- [Test Preparation](#)
- [University Academic Advising Services](#)
- [University Center for Excellence in Writing \(UCEW\)](#)
- [Writing Across the Curriculum \(WAC\)](#)

Course Topical Outline

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

Course Topical Outline

Due	Assignment	Type	Description	Points
January 24	Homework 1			TBA
February 14	Homework 2			TBA
February 28	Midterm Exam			TBA
March 28	Homework 3			TBA
April 18	Final Exam			TBA
April 25	Programming Project			TBA

Title IX Statement

In any case involving allegations of sexual misconduct, you are encouraged to report the matter to the University Title IX Coordinator in the Office of Civil Rights and Title IX (OCR9). If University faculty become aware of an allegation of sexual misconduct, they are expected to report it to OCR9. If a report is made, someone from OCR9 and/or Campus Victim Services will contact you to make you aware of available resources including support services, supportive measures, and the University's grievance procedures. More information, including contact information for OCR9, is available at <https://www.fau.edu/ocr9/title-ix/>. You may also contact Victim Services at victimservices@fau.edu or 561-297-0500 (ask to speak to an Advocate) or schedule an appointment with a counselor at Counseling and Psychological Services (CAPS) by calling 561-297-CAPS.

Artificial Intelligence Preamble

FAU recognizes the value of generative AI in facilitating learning. However, output generated by artificial intelligence (AI), such as written words, computations, code, artwork, images, music, etc., for example, is drawn from previously published materials and is not your own original work.

FAU students are not permitted to use AI for any course work unless explicitly allowed to do so by the instructor of the class for a specific assignment. [\[Policy 12.16 Artificial Intelligence\]](#)

Class policies related to AI use are decided by the individual faculty. Some faculty may permit the use of AI in some assignments but not others, and some faculty may prohibit the use of AI in their course entirely. In the case that an instructor permits the use of AI for some assignments, the assignment instructions will indicate when and how the use of AI is permitted in that specific assignment. It is the student's responsibility to comply with the instructor's expectations for each assignment in each

course. When AI is authorized, the student is also responsible and accountable for the content of the work. AI may generate inaccurate, false, or exaggerated information. Users should approach any generated content with skepticism and review any information generated by AI before using generated content as-is.

If you are unclear about whether or not the use of AI is permitted, ask your instructor before starting the assignment.

Failure to comply with the requirements related to the use of AI may constitute a violation of the [**Florida Atlantic Code of Academic Integrity, Regulation 4.001.**](#)

Proper Citation: If the use of AI is permitted for a specific assignment, then use of the AI tool must be properly documented and cited. For more information on how to properly cite the use of AI tools, visit [**https://fau.edu/ai/citation**](https://fau.edu/ai/citation)

AI Language Specific To This Course

AI Prohibited: The use of AI to assist in any work assigned in this specific course is prohibited.