

CS 325-002 Analysis of Algorithms

4 credits

CRN 37561 - Spring 2022

OSU catalog course description including pre-requisites/co-requisites: Recurrence relations, combinatorics, recursive algorithms, proofs of correctness. **Prerequisites:** CS 261 and (MTH 231 or CS225)

Instructor: Julianne Coffman

Office Hours: Posted on Canvas

Meetings: Tu&Th 10:00 – 11:50pm, Furman 102

E-mail: coffmaju@oregonstate.edu

Email should be a secondary contact for course questions with the primary contact being Canvas messaging.

TA Info: Preethi Kurapaty – kurapatp@oregonstate.edu

Textbooks: ***Introduction to Algorithms*** by Cormen, Leiserson, Rivest, Stein, 3rd Edition.

The ebook is available at

<https://ebookcentral.proquest.com/lib/osu/detail.action?docID=3339142>

Algorithms by Jeff Erickson, 1st Edition.

<http://jeffe.cs.illinois.edu/teaching/algorithms/>

Canvas: Announcements, office hours, weekly homework assignments, readings and other course information will be placed on Canvas.

Course Content:

- Analyzing algorithms for correctness and running time.
- Divide and Conquer and the use of recurrences to analyze recursive algorithms.
- Dynamic Programming
- Graph Algorithms
- Complexity Classes
- Heuristics and Approximation Algorithms

Measureable Student Learning Outcomes:

1. Define O , Ω , and θ in a rigorous way
2. Solve simple recurrence relations
3. Implement a recursive algorithm to solve a simple problem
4. Prove the correctness of algorithms using induction
5. Implement a divide-and-conquer algorithm to solve a problem of intermediate difficulty
6. Implement a polynomial-time heuristic algorithm to solve an NP-hard problem
7. Explain how a problem is shown to be NP-complete

Evaluation of Student Performance:

Scores for coursework items will be posted on Canvas & Gradescope as they are graded. Feedback will be provided when available. You will submit coursework items through Gradescope and/or TEACH **before 23:59 (TEACH server time, Pacific Time Zone)** on the date they are due, be sure you give yourself an hour or more to submit coursework.

Grade Evaluation: Your course grade will be based on the following:

Homework	50%
Quizzes 2 @ 10%	20%
In-Class Activities	15%
Final Exam	15%
TOTAL -----	100%

Homework:

There are five individual homework assignments. The assignments are a combination of written problems and programming exercises. Programs must be written in C, C++ or Python and run on flip. For each assignment you will be told which libraries you can use. Students can discuss the homework questions with each other but must independently write up a solution. Assignments are to be submitted to Canvas (written answers) and TEACH (code) **by 11:59pm** on the date.

Quizzes:

There will be two in class quizzes on during week 4 and week 8, the exact dates listed in the schedule. You will have 50 minutes to complete each quiz. You will be allowed one 3"x5" note card for each quiz.

In-Class Activities (ICA):

There are weekly in-class activities. Activities will be completed in groups during class and are due at the end of class. Your lowest activity score will be dropped.

Final Exam:

The cumulative final exam will be given in class during finals week at the time scheduled for this class, Tuesday June 7th at 9:30am.

Grading Policies:

- 1) Any requests for extensions/special accommodations must be made in advance, in writing and sent to the instructor via Canvas messaging.
- 2) **Makeup Exams** –Any requests for makeup exams must occur a week in advance to be considered.
- 3) Homework will be accepted up to 1 day late for a 10% penalty.
- 4) Any **concerns in scoring** must be addressed within one week of the work being graded. All questions about grading must be placed in the "Assignment Comments" section of the Canvas submission for that assignment.
- 5) **Incompletes** – In this online program, there will rarely be cases where an incomplete is appropriate. I will only consider giving an incomplete grade for emergency cases such as a death in the family, major disease, or child birth, while also having a passing grade. If you have a situation that may prevent you from completing the coursework, let me know as soon as you can.

Grading Scale: *Note: Average score ranges given in interval notation*

Grade	Average Score
A	[92, 100]
A-	[90, 92)
B+	[87, 90)
B	[82, 87)
B-	[80, 82)
C+	[77, 79)
C	[72, 77)
C-	[70, 72)
D+	[67, 70)
D	[62, 67)
D-	[60, 62)
F	[0, 60)

* REMINDER: A passing grade for core classes in CS is a C or above. A C-, 72 or below, is not a passing grade for CS majors.

University Policies

Academic Calendar:

All students are subject to the registration and refund deadlines as stated in the Academic Calendar: <https://registrar.oregonstate.edu/osu-academic-calendar>.

Statement Regarding Students with Disabilities:

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Face Covering Guidance & Public Health Policy:

The University's guidance for face coverings will be upheld in the classroom. Since the policy may change as the situation evolves please refer to the following link: <https://covid.oregonstate.edu/face-covering-guidance-public-health-policy>

Expectations for Student Conduct:

<https://beav.es/codeofconduct>

Reach Out for Success:

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at oregonstate.edu/ReachOut . If you are in immediate crisis, please contact the Crisis Text Line by

texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255)

Student Bill of Rights:

OSU has twelve established student rights. They include due process in all university disciplinary processes, an equal opportunity to learn, and grading in accordance with the course syllabus:
<https://asosu.oregonstate.edu/advocacy/rights>