CS 325-002 Analysis of Algorithms

4 credits

CRN 37561 - Winter 2022

OSU catalog course description including pre-requisites/co-requistes: 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 12:00 – 1:50pm

E-mail: coffmaju@oregonstate.edu
Email should be a secondary contact for course questions with the primary contact being Canvas messaging.

TA Info: Posted on Canvas

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

Course Policies:

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:

Scores for coursework items will be posted on Canvas as they are graded. Feedback will be provided when available. You will turn in all coursework items through Canvas 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 ---------	70%
Quizzes ----------	30%
**TOTAL ---------- **	**100%**

Homework:

There are six individual homework assignments. The assignments are a combination of written problems and programming exercises. Programs must 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.

Homework Grading Policies:

- Assignments that are not neatly written up using a word processor/text editor will not be graded.
- Homework submitted up to 24 hours late will receive a 10% penalty.
- Homework submitted from 24 to 48 hours late will receive a 20% penalty.
- Homework submitted from 48 to 72 hours late will receive a 30% penalty.
- Any **disagreement 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. If a response to your comment is not posted within 48 hours you can email a TA requesting that they review the comments.

Quizzes:

There are seven quizzes for this course, Quizzes administered in Canvas and contain multiple choice. True/False, matching and fill in the blank questions. Each quiz attempt has a 90 minute time limit and is not proctored. You will get two attempts at each quiz and your highest score is kept. Some quizzes contain randomly selected question so you may receive different questions on each attempt at the quiz.

Quiz Policies:

- Late quizzes are not accepted
- Your low quiz score will be dropped

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

Grade	Average Score
A	[93, 100]
A-	[90, 93)
B+	[87, 90)
B	[83, 87)
B-	[80, 83)
C+	[77, 79)
C	[73, 77)
C-	[70, 73)
D+	[67, 70)
D	[63, 67)
D-	[60, 63)
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.

Course 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.

Attendance Policy - Be respectful of your classmates' right to learn and my right to teach by following these rules:

- No talking, watching videos, playing games or playing with your cell phone.
- Class attendance is not required, but it is **STRONGLY ENCOURAGED.**
- When a class is missed, it is the STUDENT'S responsibility to obtain any notes, assignments.
- Please be on time for lecture because it can be disruptive to other students, as well as the instructor.
- If the instructor is late for a lecture, please remain in the classroom for 10 minutes.

Students With Disabilities
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 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

Academic Integrity: Students in academic studies are expected to demonstrate their own knowledge and capabilities. This means that a student will be graded on the work that is clearly their own work and that additional materials will be excluded from consideration of the grading of that submission. Work that is not created by the student or cited by the student, but still submitted will be considered plagiarized material and may result in a failed submission and may result in administrative action.

- You May openly discuss the presented learning materials and participation category materials at any time with any party as long as they explicitly know that it is for an academic assignment,
- You May openly discuss the demonstration category of coursework and exams category of coursework after grading of the item is complete with any party as long as they explicitly know that it is an academic assignment and that the discussion is accompanied by an explanation of any materials presented,
- You MAY openly discuss the meaning of assignments, general approaches, and strategies with other students in the course; you may do this even before the grading date of the assignment has passed.
- You MAY (and should) use the Internet and other resources to research how to solve a problem, and you should share what you find for others in the course to learn from, but be sure to cite your sources!

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)

Course Evaluation:

OSU Student Evaluation of Teaching – Course evaluation results are extremely important and are used to help me improve this course and the learning experience of future students. Results from the multiple choice questions are tabulated anonymously and go directly to instructors and department heads. Student comments on the open-ended questions are compiled and confidentially forwarded to each instructor, per OSU procedures. The online Student Evaluation of Teaching form will be available toward the end of each term, and you will be sent instructions through ONID. You will login to "Student Online Services" to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.