CS 325-002 Analysis of Algorithms
4 credits

CRN 59195 - Spring 2021

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 Schutfort**
Office Hours: Posted on Canvas

Meetings: Tu&Th 10:00 – 11:50am

E-mail: schutfoj@engr.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 **before** 23:59 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 GradeScope (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.
- Any **disagreement in scoring** must be addressed within one week of the work being graded. You must submit a regrade request in Gradescope.

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.   The quizzes are untimed and not proctored. You will get two attempts at each quiz and your high 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)

Students With Disabilities: Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Expectations for Student Conduct:

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 at any time with any party as long as they explicitly know that it is for an academic assignment,

- You May openly discuss the coursework after grading of the item is complete with any party as long as they explicitly know that it is an academic assignment.

- 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 MUST include a citation to indicate the source of any help you received (otherwise you will be claiming that you authored the work, and that is unfair and possibly a misrepresentation of your own direct skills); you should do this even if the source is an instructor or TA. This basically means that a citation will save you from most situations that may get you in trouble with plagiarism, but that I will exclude any work by others from grading consideration,

- You MUST write your own code for your assignments; this means that you should take notes on anything you do with others and use your notes instead of any shared code when

working on the assignments at hand. If you cite your sources, then instead of confronting you about possible plagiarism, we will grade you based on the work that you authored.

EECS Code Sharing Policy webpage: http://eecs.oregonstate.edu/online-cs-students/current-students/class-resources/policies

We may use plagiarism-detection software check your code against other code-bases, reduce the likelihood that we will use these tools by citing your sources and recreating the desired behavior by recreating the code you learn from (in the very least it will give you more practice)!

If you are found in violation of any of the above policies, whether you are the giver or the receiver of noncited help, you may be given a zero on the assignment, failed from the course, or receive higher administrative action. The academic dishonesty charge will be documented and sent to your school's dean and the Office of Student Conduct. The first offense may result in a warning; the second offense results in an academic dishonesty charge on your transcript, a disciplinary hearing, and possible expulsion.

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.