

COSC 220: Computer Science II (Fall 2020)

Instructor: Dr. Sang Eon Park

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Prerequisite: COSC 120 Computer Science I or equivalent with a grade of C or better and MATH 210 Discrete Mathematics or equivalent with a grade of C or better. MATH 210 may be taken concurrently.

Description: A study of the design and implementation of abstract data types and algorithms using an object-oriented approach and standard class library. Attention will be paid to the introduction of data structures such as linked lists, vectors, stacks, queues, heap, priority queues, lists, trees, binary search tree etc.; searching and sorting algorithms and their runtime analysis. C++ is the teaching language.

References:

- Starting out with C++ from control structure through objects 9th Edition, by Tony Gaddis, Pearson 2017

Remote Lecture: M. W. F. 08:00 A.M. ~ 08:50 A.M.

- Each lecture will be conducted remotely by Zoom.
- Zoom link will be sent to each student by e-mail five minutes before each class.
- Students must turn on web cam during the lecture.
- Attendance will be checked for each class.
- Each lecture note will be available on my homepage (<http://faculty.salisbury.edu/~sxpark>) at least one day before each lecture.

Remote Lab: Th. 08:00 A.M. ~ 09:40 A.M.

- Each Lab will be conducted remotely by Zoom.
- Zoom link will be sent to each student by e-mail five minutes before each lab.
- Attendance will be checked for each lab.
- Student must have the camera on during each lab hours
- Student will work each lab assignment in LINUX environment
 - Student with Window system: Instructor will provide instruction for installing virtual Linux on hypervisor (virtual box).
 - Student with Mac: Mac provide Linux emulator.
- Lab assignment will be provided at the beginning of a lab class by e-mail. Each lab assignment has submission due date. Student must submit each lab assignment on time by e-mail (cosc220fall20@gmail.com). Late lab work will not be accepted without special permission.
- Each student must be ready to show his/her works at the beginning of each lab class. Student might need demonstrate his/her job remotely. (code must be compliable with expected output)

- Students are expected to work independently on each lab. Copying code is strictly prohibited. Copying code from another student or any other source (e.g., a web site) is considered plagiarism and will be prosecuted under the Code of Student Conduct at Salisbury University. If two students have identical or similar work, both will be given a failing grade.

Office Hour:

- Remote office hour will be conducted by using Zoom.
- Zoom link will be sent to each student by e-mail five minutes before each office hour
- Office hours for Fall 2020:
 - Monday, Wednesday, Friday between 9:00 A.M. and 11:00 A.M.

Topics:

Pointers & Arrays

Review of pointers, passing pointers as parameters, relations of pointers and array, dynamic memory allocation, array of pointer types

Implementing class

Creating classes: constructors, destructor, overloading function and operators, templates inheritance, polymorphism

Algorithms

Searching and sorting (insertion, merge sort, quick sort, radix sort algorithms with arrays)

Data Structures Implementation

Discuss implementation of vector, stack, queue, list using pointer-based array and/or linked lists

Advanced Recursion

Review concepts in recursive functions and examples of recursive functions

Linked Lists

Introduce singly linked and doubly linked list and their manipulations

Algorithm Efficiency Analysis

Introduce asymptotic notations (big-O, big-Ω, big-Θ) and basic related theorems, perform runtime analysis on searching and sorting algorithms

Data Structures

Introduce vector, stack, queue, list manipulation (using recursive/non-recursive approach) through their STLs

Advanced Data Structures and Algorithms

Introduce table, heap, priority queue, and binary search trees and dynamic algorithm

Homework/Project Policy

- I expect that each student hand in your original work by e-mail. Co-operative work will be regarded as academic dishonesty.
- If two students have identical or similar work, both will be given a failing grade in the course irrespective of whose work was copied.
- Each homework/project should be submitted by e-mail within the due date. Late homework/project will not be accepted.

Exam Policy:

- There will be an announcement for each exam (midterm, mini-test or final exam).
- Students will take each test remotely during lecture hour.
- There will be no make-ups or rescheduling of exams for individual cases (except emergency cases with evidence).
- Instructor will send exam questions to each student by e-mail right before test hour.
- During the test, student must have the camera on.
- Students must submit their test answer within the given time by e-mail (cosc220fall20@gmail.com). Late submission cannot be accepted.

Grade: Test 1- 20 %, Test 2 – 20 %, Final – 30 % Lab&Project/Mini-test – 15%/15%. Your final grade will be based on the standard formula

- **A:** $90 \leq \text{Total_Average_score}$
- **B:** $80 \leq \text{Total_Average_score} < 90$
- **C:** $70 \leq \text{Total_Average_score} < 80$
- **D:** $60 \leq \text{Total_Average_score} < 70$
- **F:** $\text{Total_Average_score} < 60$

Attendance: Each student is expected to be present each lecture and lab. Attendance will be checked for each class and lab. If a student misses lectures more than 6 times (2 weeks) without any reason with evidence, he/she will lose 3% from the total average score. If a class must be missed, however, students are responsible for all material, assignments, and announcements made during class.