CS162: Due Dates

Spring 2020

(The following dates are subject to change!)

Program Number	Assignment Description	Due Date	Late Date	Due Time
Algorithm #1	Algorithm and Flowchart[1] (Use outline form)	Tues 4/7	Thurs 4/9	7pm
Program #1	Program[2]	Tues 4/14	Thurs 4/16	7pm
Algorithm #2	Algorithm and Flowchart[1] (Use outline form)	Tues 4/21	Thurs 4/23	7pm
Program #2	Program[2]	Tues 4/28	Thurs 4/30	7pm
Algorithm #3	Algorithm and Data Flow Diagram[4] (Use paragraph form)	Tues 5/5	Thurs 5/7	7pm
Program #3	Program[2]	Thurs 5/14	Mon 5/18	7pm
Algorithm #4	Algorithm and Data Flow Diagram[4] (Use paragraph form)	Tues 5/19	Thurs 5/21	7pm
Program #4	Program[3]	Tues 5/19	Thurs 5/21	7pm
Program #5	Program[3] **(No Algorithm and No diagram)**	Tues 6/2	Thurs 6/4	7pm

Exams	Topics	Date	Time
Midterm #1	• Topic #1 • Conditionals and Loops • Arrays	Thursday 4/23	60 min
Midterm #2	• Topic #2 and #3 • Functions • Structures • Classes	Tuesday 5/12	60 min
Final Exam	• Comprehensive • Topics 1-6 • Linear Linked Lists	Thursday 6/11	10:15-12:05

1 Algorithm submission should be written in outline form (400-600 words); include a flow chart

2 Program submission includes .cpp file.

3 Program submission includes .cpp and .h files. Please tar your submissions.

4 Algorithm submission should be written in paragraph form; include a data flow diagram

CS162: Course Outline: *(7th Edition of Malik)*

Spring 2020

Section 001:WATCH THE VIDEOS PRIOR to our in-class Zoom Chat sessions

(the following outline is subject to change!)

WEEKS #1 and 2: Getting started with C++

Date: **Topic:** **Reading/Projects:**

3/31 ***** Please read the syllabus *****

• Introduction: Syllabus, Objectives for the Course, Class Introduction, and Review Outline. **Malik: 1, Shk: 1**

4/2 **Topic #1-Part I**

Topic #1-Part I example of a flowchart, algorithm and first C++ program

- Structure of C++ Programs **Malik: 2,3**
- C++ Statements
- Data Types and Operators

Week #1 Lab Session:

Linux Lab #1 – Getting Started with linux

CS162 Lab #1 – Getting Started **No Prelab Exercises for the first lab!**

4/7 **Topic #1-Part II Selective Execution**

Topic #1-Part III on Repetition

Continue with C++ (if statements and loops)

- I/O, Conditionals, Repetition, Arrays **Malik: 4, 5, Shk: 2**
- Branching Statements
- Loops and Relational Expressions
- I/O and formatting output

4/9 **Topic #1-Part IV on Arrays**

Topic #1-Part V on an example using Arrays

Continue with C++ (Arrays)

- Arrays, Strings, String I/O
- Explore C++ arrays of characters

Week #2 Lab Session: **Complete the Prelab Exercises before lab!**

Level 1 Linux Exercise #1.1 – Files and Directories

CS162 Lab #2 – Topic #1 Getting Started with C++ syntax

WEEK #3: Functions

Date: **Topic:** **Reading/Projects:**

4/14 Topic #2 Part I on an example using Functions
Overview of C++ Functions **Malik: 6, 8 (on Arrays)**

- Demonstration: Designing using modularity
- Demonstration: Writing programs using functions with arguments
- Explore C++ functions, pass by reference, pass by value, and returning values

4/16 Topic #2 Part II on Functions
More on Functions:

- Prototypes vs. Function Definitions
- Pass by value, by reference, by const
- Passing fundamental types and arrays

Week #3 Lab Session: **Complete the Prelab Exercises before lab!**

Level 1 Linux Exercise #1.2 – Wildcards
CS162 Lab #3 – Arrays

- Practice C++ arrays of characters, creating, reading, manipulating
- Gain experience with cstring and cctype libraries
- If you can't complete the entire lab, consider attending a makeup session
- Complete the self-check quiz in the CS162 lab manual after you have finished the lab! Remember to work on the self-check quiz as closed-book, closed notes!

WEEK # 4: Structures, External Files

Date:	Topic:	Reading/Projects:
4/21	**Topic #2 Part III on Structures** **Topic #2 Part IV on an example of Structures** • What they are • How to create them • Working with arrays of structures	**Malik: 9, Shk: 3**
4/23	**Midterm #1** **Study problems from the lab manual for Labs 1-3 **Study midterm proficiency demo problems	

Week #4 Lab Session: **Complete the Prelab Exercises before lab!**

Level 1 Linux Exercise #1.3 – Using Redirection
CS162 Lab #4 – Functions and Arguments

- Remember to read the background information in the lab manual prior to completing the prelab exercises
- Practice: Writing programs using functions with arguments
- Explore C++ functions, pass by reference, pass by value, and returning values
- Use the self-check quiz after the lab is over to determine your level of proficiency!
- And, remember to program every day!!

WEEK #5: External Files and Classes

Date: **Topic:** **Reading/Projects:**

4/28 **Topic #2 Part V on External Data Files**
Topic #2 Part VI on an example of External Data Files

- Lecture: External Data Files
- Demonstration: Writing programs using structs and external files
- Explore C++ functions working with structs
- Experience external data files

4/30 **Topic #3 Part I on Modular Abstraction**
Topic #3 Part II on the Class Concept
Topic #3 Part III on an example of the Class Concept

C++ Class Construct, Data Abstraction and Abstract Data Types

- Data Abstraction and Abstract Data Types **Malik: 10**
- The C++ Class, Class versus Structs **Shk: 4**
- Class Constructors, Defining and Using Functions and Classes.
- General discussion of the C++ Class and creating .h files
- Constructors

Week #5 Lab Session: **Complete the Prelab Exercises before lab!**

Level 1 Linux Exercise #1.4 – Backing-up Files
CS162 Lab #5 – Structures and External Files

- Practice: Writing programs using structs
- Explore C++ functions working with structs
- Experience using external data files

WEEK # 6: Pointers and Dynamic Memory

Date: **Topic:** **Reading/Projects:**

5/5 **Topic #4 Part I on Pointers**
Pointers and Dynamic Memory **Malik: 12**
- Introduce pointer variables, memory allocation and deallocation
- Examples manipulating pointers **Shk: 5.1-5.4**

5/7 **Topic #4 Part II on Pointer Arithmetic**
Topic #4 Part III on an example using Pointers

Pointers and Dynamic Memory
- Pointer Arithmetic
- Pointers to structs (learn about the . versus ->)

Week #6 Lab Session: **Complete the Prelab Exercises before lab!**

Level 1 Linux Exercise #1.5 – Archiving Files
CS162 Lab #6 – The Class Construct

- Experience building classes and member functions
- Pay close attention to the Linux exercises #1.4 and 1.5 on backing up and archiving

WEEK #7: Linear Linked Lists

Date: **Topic:** **Reading/Projects:**

5/12 Midterm #2 – Functions, Structures, Classes

5/14 Topic #4 LLL - Part I on LLL Introduction
Topic #4 LLL - Part II on an example of LLL traversal

Dynamic Data Structures **Malik: 17**
- Review of Pointers and the new Operator
- Pointer Arithmetic
- Introduction to Linked Lists **Shk: 5.5-5.6**
- Demonstration: Using pointers and linked lists

Week #7 Lab Session: **Complete the Prelab Exercises before lab!**

Level 1 Linux Exercise #1.6 – Getting Started with vim
CS162 Lab #7 – Pointers and Dynamic Memory

**** Important for the Final Proficiency Demo ****

- Remember to read the background information prior to completing the Pre-Lab exercises!
- Experience pointers and dynamic memory
- Practice traversing linear linked lists
- Continue exploring the use of classes

WEEK # 8: Manipulating Linear Linked Lists

Date: **Topic:** **Reading/Projects:**

5/19 **Topic #4 LLL - Part III on inserting into a LLL**
Topic #4 LLL - Part IV on examples inserting

5/21 **Topic #4 LLL - Part V on removing from a LLL**
Topic #4 LLL - Part VI on examples removing

Dynamic Data Structures
- Insert and Removal Algorithms
- Demonstration: Inserting and Removal
- Explore writing functions to traverse and modify a linear linked list
- Explore Classes and dynamic structures
- Intro to Recursion using a recursive destructor

Week #8 Lab Session: **Complete the Prelab Exercises before lab!**

Level 1 Linux Exercise #1.7 – vim Navigation
CS162 Lab #8 – Linear Linked Lists

**** Important for the Final Proficiency Demo ****

- Experience building and removing from linear linked lists
- Continue exploring the use of classes
- IMPORTANT – make sure to practice working with linear linked list problems daily!

WEEK #9: Recursion

Date:	Topic:	Reading/Projects:
5/26	**Topic #5 Part I on Recursion** **Topic #5 Part II on an example of Recursion**	**Malik: 15** **Shk: 4.10, 6**

- The Nature of Recursion, Tracing a Recursive Function, Recursive Mathematical Functions, Recursive Functions with Array Arguments
- Work through examples of recursion in class
- Problem solving with Recursion

5/28 **Topic #5 Part III practicing with Recursion**

- Demonstration: Recursion and LLL
- Explore writing recursive functions

Week #9 Lab Session: **Complete the Prelab Exercises before lab!**

Level 1 Linux Exercise #1.8 – Making Modifications with vim
CS162 Lab #9 – Recursion

WEEK #10: Advanced Pointers and Review

Date:	Topic:	Reading/Projects:

6/2 **Topic #6 Part I on Advanced Pointers**

Arrays with Structured Elements **Malik: 8**

• Arrays of Arrays: Multidimensional Arrays, **Shk: 8**

Creating Arrays of Arrays, Arrays of Structs, and Arrays of Class Elements.

6/4 **Prep for Final**

Prepare for Final Exam

- Review concepts
- Discuss expectations for the midterm
- Work through sample problems

Week #10 Lab Session: **Complete the Prelab Exercises before lab!**

Level #1 Linux Self Check Exercises
CS162 Lab #10 – Practicing LLL (required)

- Remember to read the background information in the CS162 Lab manual before completing the Pre-Lab exercises

Finals Week:

Watch for an email about taking the Final Proficiency Demo

Final Exam Time: **Thursday June 11th 10:15-12:05**