CSCI 515, Fundamentals of programming C/C++

COURSE SYLLABUS: Fall 2022

INSTRUCTOR INFORMATION

Instructor	Prof. Eman Hammad
Office Location	RELLIS Campus, ACB2-208
Office Hours (zoom)	Wednesdays 10:30-12:30 (zoom), or by appointment
Email	eman.hammad **at** tamuc **dot** edu
Communication Response Time	Within 24 hours on weekdays, but any communication after Friday 5pm will be responded the following Monday

COURSE INFORMATION

Lectures (Time/Location):

- We will utilize a mix of synchronous and asynchronous lectures for our online class as detailed below:
    - Live/synchronous: Tuesday 11:00 – 12:00 AM.
    - Asynchronous lecture recordings.
    - Recordings for all lectures will be uploaded to D2L LMS.

Lab: web-based lab

Course credit hours: 4

Required Textbook(s):

- There are NO required textbooks for this course as many open-source C/C++ programming textbooks and resources can be found online.

Recommended Textbook(s) and Resources:
- D . S. Malik, C++ Programming: From Problem Analysis to Program Design, 7th Edition. Cengage Learning, ISBN 9781285852744 or 8th, or 6th, or 5th edition
- C++ HOW TO PROGRAM, 10th Edition, by Deitel and Deitel, published by PEARSON, 2017, with ISBN-13: 978-0134448237 (ISBN-10: 0134448235)

Web resources are also available. You can access the following sites with great tutorials and programming examples
- Tutorialspoint. https://www.tutorialspoint.com/cplusplus/
- C++ Language – C++ Tutorials. http://www.cplusplus.com/doc/tutorial/
- C++ Tutorial - Learn C++ - Cprogramming.com. https://www.cprogramming.com/tutorial/c++-tutorial.html

Course Description

This is an advanced programming course using a high level programming language. Specific objectives are to introduce the development of algorithms as a disciplined approach to problem solving; to present programming practices in design, decoding, debugging, testing and documentation of computer programs; and to provide the student with the basic knowledge necessary for further study in the field of computer science.

Student Learning Outcomes

Upon completing this course students should be able to:

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- to understand the basic elements of a computer program including documentation, data declaration, and procedural operations
- to edit, translate, and execute a computer program
- to write programs that input data from keyboard/file and output to the console/file
- to apply control structures to alter the sequential flow of execution of program statements including selection and iteration structures
- to create user-defined functions, develop programs consisting of multiple functions, and master function parameter passing
- to understand the internal representation of the various data types
- to review the language syntax and learn new syntax you have not previously used in programming applications
- to correctly solve programming problems and learn how to develop algorithms
- to examine the internal representation of two- and three-dimension arrays in C/C++
- to understand dynamic memory allocation, parameter passing, the use of pointers

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Basic computing skills such as operating systems, program compliers, usage of IDE and use of words editors such as Microsoft word.

Instructional Methods

During this course, we will be using traditional and active learning methods, and work together using:

- Lectures: using slides, supplementary materials, and hands-on exercises.
- Assignments/labs that will be released via the Learning Management Systems (D2L).

Student Responsibilities and Tips for Success in the Course

It is expected that you are the owner of your success in this course, including ensuring you understand the expectations, timelines, policies and learning objectives.

Baseline expectations:

a. Check LMS frequently and remain current with the course content and assignments
b. Start your homework assignments early so that you can ask for help if needed.
c. Check the feedback on homework assignments.
d. Do your own work: you are encouraged to collaborate and consult with classmates to improve your understanding and to develop problem-solving strategies. However, cheating and plagiarism will not be tolerated, i.e. do not copy other people's work.
e. Communicate with the instructor when you are confused, or having difficulties with the course material / assignment / project.
f. Get help (sooner than later) if you have challenges or problems:
    - Department tutors.
    - Academic success center provides tutoring in the library for a variet of subjects.
    - Start or join a study group with classmate(s) from the course to compare notes and discuss class content.

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g. What you get out of any class depends to a very large degree on what you are willing to put into it. Get in the habit of writing little practice programs to try out new language features as we learn them. As you write more programs (even small ones), the process becomes easier, you are much more likely to remember how the language works, and you get much better at programming logic (the hardest part of computer programming).

GRADING

Final grades in this course will be based on the following scale: A = 90%-100%, B = 80%-89%, C = 70%-79%, D = 60%-69%, F = 59% or below.

Assessments

Assessment Type	Weight of Final Grade	Learning Objectives
Assignments, labs, and quizzes	40 %	
Midterm Exam	30%	Critical understanding and problem solving using course concepts
Final Exam	30%	

- Grades will be posted within one week after assignment due date.
- You are responsible to check your grades after each assignment. You must report any error or inconsistency to the instructor within 5 business days.

COURSE OUTLINE / CALENDAR

Class meets 8/29/2022- 12/16/2022

Week 11: array operations, C-strings (char arrays), multi-dimensional arrays Week 12: application of arrays: searching and sorting
Week 13: pointers, new and delete operators, dynamically created arrays
  Week 14: records (struct): memory status of structs, arrays in structs, functions with structs, structs in structs
Week 15: classes: private and public access, functions as members Week 16: classes: private and public access, functions as members

➢ **Tentative calendar**

Week	Topic(s)	Assignment/Lab/Exam
1	• Introduction, comments, data types, cin, cout, operators and operator precedence	Lab1
2 - 3	• Relational operators, control structures: selection	
4	• Control structures: repetition	Lab 2
5	• Input/output, file input/output	
6	• Functions: predefined functions, pass by value, pass by reference	
7	• Functions, continue • Midterm exam review	Midterm Exam
8	• Functions: scope, static variables, function overloading, default parameters	Lab 3

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9-10	• Arrays with different data types, index and access to arrays	
11	• Array operations, C-strings (char arrays), multi-dimensional arrays	
12	• Applications of arrays: searching and sorting	Lab4
13	• Records (struct): memory status of structs, arrays in structs, functions with structs, structs in structs	
14	• Pointers, new and delete operations, dynamically created arrays	
15-16	• C++ OO programming principles • Final exam review	Final Exam

*The schedule is **tentative** and may be adjusted to fit the actual class progress.

Coding Environment

There is a set of great free C++ compliers and IDEs (integrated development environments that have many built-in tools for editing, compiling, running, and debugging programs) available for major OS platforms. Download one that suits your platform.

- **Linux**
  - Complier: GCC that comes with Linux. Please check whether it has been installed on your system.
  - IDE: Vim (https://vim.sourceforge.io/download.php), Eclipse CDT (https://www.eclipse.org/cdt/), Clion (https://www.jetbrains.com/clion/)
- **Windows**
  - Complier: MINGW at http://www.mingw.org/
  - IDE: Dev C++ (http://www.bloodshed.net/devcpp.html), Microsoft Visual Studio Express 2013(http://www.visualstudio.com/en-us/downloads), Eclipse CDT (https://www.eclipse.org/cdt/), Clion (https://www.jetbrains.com/clion/)
  - **Mac OS**
    - IDE: Apple Xcode which comes bundled with GCC. You can download it at https://developer.apple.com/ios/
    - CLion: Download at https://www.jetbrains.com/clion/

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo

Online Learning Management System (LMS). Below are technical requirements

LMS Requirements: https://community.brightspace.com/s/article/Brightspace-Platform-Requirements
LMS Browser Support: https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm
YouSeeU Virtual Classroom Requirements: https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID

or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or

helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course

work in a timely and satisfactory manner. Each student is expected to have a backup method to deal with these

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inevitable problems. In case of extreme technology related circumstances, please communicate directly with the instructor to best manage your success in this course.

COMMUNICATION AND SUPPORT

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

To communicate with me about this course, kindly use the email address included in this syllabus. During the week, you can generally expect a response to your emails within 1-2 business days. *If you do not receive my response in 2 business days, please send a second email to me.*

To ensure I get your email and respond within indicated timelines above, please make sure that:

- Your email message is sent from your Texas A&M student account.
- Your email message includes a descriptive subject with the indicated prefix:
  CSCI 515 – Fall 2022 --<CWID>: <descriptive subject>

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

For the online course, student should make an effort to attend the live lecture if possible or listen to the recorded lecture. Students are required to keep up with class materials and announcements made during live lectures or via emails, including changes to due dates or assignments. Attendance will be evaluated based on the submission of assignments and labs. As a student, you are responsible for managing your own time and workload. If you are facing an emergency / extreme circumstances causing you to miss deadlines/exams, you are responsible to provide official and university approved documentation to support relevant requests (check late work and makeup work policies below).

Positive Learning Environment

Your commitment as a student to learning is evidenced by your enrollment at Texas A &M University-Commerce. "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedure, Conduct).

Sharing Your Work

All work produced by students may be shared by the instructor with the class for purposes of example and training. Such work will be as anonymous as possible. Finally, the instructor may share your work anonymously with future classes or in her own writing and research.

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Submitting Assignments:

- Each week there will be an assignment, lab, and/or quiz that you should be solve independently and is tightly related to the class materials and topics. Submissions are expected to be completed in a good quality and by the deadlines.

- Your completed work must be placed in the appropriate dropbox in D2L Online. **DO NOT EMAIL ME ANY ASSIGNMENTS AS THEY WILL BE DELETED**. If you have challenges in accessing D2L temporarily, you can email me your assignment as a proof of on-time submission. **However**, you still need to upload it to the assignment folder as soon the issue is resolved to receive credit.

- You must check your files before and after uploading them to D2L to ensure they can be open appropriately. In the case that the instructor is not able to open your submission file(s) your submission will not be graded.

- Unless special instructions are provided**, assignments are NOT to be posted on ANY discussion board, online websites or file-sharing platforms**. Please follow the rules for naming and posting assignments.

- All assignments must be submitted using D2L if applicable. Students must adhere to the following rules when submitting assignments. Failure to do so will affect their grades.
  - **File Name:** Should be named according to the following pattern:
    <LastName>_<FirstName>_X.**, where LastName is the student's last name, FirstName is the student's first name, and X is the assignment number.
    - For example, my assignment3 C++ file submission will be named Hammad_Eman_assignment3.cpp for a programming assignment.
  - **File Header:** for programming the first lines of the submitted file should include a comment with the following information and format:

```
/**
*       A short description of the program.
*
*       @author        Last Name, First Name
*       @assignment CSCI515 Assignment X
*       @date   Date
*/
```

Late Work Policy

All assignments are due at the date and time specified. **Please keep in mind that NO late work will be accepted without penalty**. If an assignment is turned in after the due date, **20% of the grade will be forfeited**. An assignment must be submitted within 24 hours of the due date if you want it graded.

- You have <u>one 24-hour "late day" token</u> that can be used on any of the assignments.
- After you've used your token, assignments will still be accepted up to 24 hours late, but with a 20% penalty (automatically deducted).
- Assignments turned in more than 24 hours late will NOT be reviewed and will not be graded.

Additional extensions on assignments will be granted with appropriate documentation. If you have a problem

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submitting an assignment on time you should contact me **BEFORE** the deadline.

Makeup Policy

There will be NO makeup exams or quizzes. If you shall miss a quiz/exam because of <u>acceptable **extreme** circumstances</u> (hospitalization, serious injury, death in the family etc.), you may be offered to choose to receive a grade based on your in-class ranking in the next quiz/exam.

Collaboration Policy

Students are encouraged to consult with each other, with the instructor, or anyone else about any assignments / project. However, this must be limited to the discussion of the problem and sketching general approaches to a solution. Each student is responsible for submitting their own independent solutions to the assignment / project. **Consulting another student's or group's solution is prohibited**, and <u>submitted solutions may not be copied from any source</u>. These and any other form of unacceptable collaboration on assignments constitute **cheating**. If you have any question or doubts about whether some activity would constitute cheating, please feel free to ask.

Academic Integrity

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments / quizzes / exams / labs are to be completed by the individual student unless otherwise specified.

Any student caught cheating will receive a zero on the work they are doing, and subsequent cheating will result in a failing grade and potential academic sanctions.

Basic Tenets of Common Decency

"All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (Student's Guide Handbook, Policies and Procedures, Conduct.). This means that rude and/or disruptive behavior will not be tolerated.

Disclaimer

This syllabus is meant to provide general guidance of what to expect from this course. The instructor reserves the right to make changes as appropriate based on the progress of the class. All changes made to this syllabus during the semester will be announced. This document has been posted electronically. If you print a copy of it, please be sure to consult the last modified date of the online version to verify that your printed copy is current.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx).
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

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Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.

http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce, Gee Library- Room 162, Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: Office of Student Disability Resources and Services

http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

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