GMU Summer 2019

CS 222-B01 Computer Programming for Engineers

Instructor: Hal Greenwald (hgreenwa@gmu.edu)

4:30 pm - 7:10 pm	MW	Blueridge Hall 129

Office Hours: By appointment
REQUIRED TEXTBOOK: Hanly and Koffman,
"Problem Solving and Program Design in C," 8th ed.

DESCRIPTION: CS 222 is a second course in computer programming, emphasizing programming concepts relevant to engineers. Topics include both higher level and lower level language aspects as well as elementary data structures. Students are expected to have a basic understanding of programming in some high-level language. CS 222 will be taught using C, but students are not presumed to be familiar with C prior to this class. This course is intended as a terminal course in programming for engineers.

Prerequisite: C or better in CS 112.

Course outcomes:

1. Be able to implement, test, and debug a designed solution to a problem using the C programming language.
2. Demonstrate a good understanding of C language constructs such as pointers, dynamic memory management, and address arithmetic.
3. Demonstrate a good understanding of C libraries for input and output, and the interface between C programs and the UNIX operating system.
4. Demonstrate an ability to use UNIX tools for program development.

COURSE POLICIES

Class: Students are expected to attend lecture each week and are responsible for all material covered during lecture.

Electronic Devices: Use of electronic devices (including laptops, tablets, cell phones, etc.) is not permitted during class. Please make sure all such devices are turned off or silenced while class is in session.

Programming Assignments: Programming assignments will be posted on Blackboard as they are assigned, and must be submitted on Blackboard by the assigned due date. If your program is incomplete, you may still submit for partial credit. **Your code must run without obvious errors (even if not all functionality is present)**. Building your

programs in a modular fashion, and debugging as you go, are crucial concepts in program development. Any programming assignment that is submitted but either does not compile or has major errors when it is run will receive no more than 50% credit.

Students are expected to work independently outside of class to familiarize themselves with the GMU computer systems, to read and review all assigned materials and to complete all homework and programming projects.

Reading: Students are responsible for reading and understanding all assigned material. Be aware that some material covered in class may not be found in your textbook. If you do not understand any of the covered material or reading assignments, there will be opportunities to ask questions in and after class.

Due Dates: Due dates for all programming projects will be posted on Blackboard. Homework assignments are due in the manner stated (either through Blackboard or in class.)

Late work: No late submissions are permitted. If your program isn't the way you'd like it to be when the deadline arrives, submit it anyway for partial credit.

GRADING POLICY

Your course grade will be an aggregate of the following items:

- Homework (35 points)
- Midterm Exam (30 points)
- Final Exam - cumulative (35 points)

Grading:

- A+ is at least 98 points
- A: is at least 90 points
- B+: is at least 88 points
- B: is at least 80 points
- C: is at least 70 points
- D: is at least 60 points

CLASS COMMUNICATIONS

CS 222 will be using the Blackboard system for most class communications. You are responsible for any notifications or information posted on Blackboard, and you will need to check Blackboard regularly for such notices. Some information may be disseminated through Blackboard rather than in class. Individual communications with the professor may be done by email using your GMU email account.

When you email, please be sure to include your name, the class number and the topic in the subject header. (E.g.: Subject: Jim Jones / CS 222 / assignment 2)

PROGRAMMING POLICIES

(1) **No sharing or discussion of code for assignments**. Unless specifically stated otherwise, all assignments are individual projects, not group projects. Students are expected to do their own work, not to share programs with each other, nor copy programs from anyone else. Any discussion or sharing of code outside these guidelines constitutes an honor code violation. Suspected honor code violations are taken very seriously, and will be reported to the Honor Committee.

(See https://oai.gmu.edu/mason-honor-code/

(2) **No incorporation of code from any source external to the course**. You may not incorporate code written by others. Of course, you may freely use any code provided as part of the project specifications, and you need not credit the source. Working something out together with the instructor usually will not require crediting the source.

(3) **Back up your program regularly.** You are expected to backup your program in separate files as you get different pieces working. Failure to do this may result in your getting a much lower grade on a program if last minute problems occur. (Accidently deleting your program, having problems connecting, etc., will not be accepted as excuses.)

(4) **Keep an untouched copy of your final code submission**. It is important that you not touch your programs once you have made your final submission. If there are any submission problems, consideration for credit will only be given if it can be verified that the programs were not changed after being submitted.

(5) **Code must compile with Mason gcc**. Students may develop programs using any computer system they have available. Please note, however, that submitted projects must run under a C compiler available on Mason. Your documentation should clearly state which software was used for compilation, and once makefiles are introduced, a makefile should be included with each assignment submission. No extensions will be given due to compiler incompatibilities.

TENTATIVE CLASS SCHEDULE

The following represents the essential schedule of topics that will be covered during lectures in the classes indicated below. Reading assignments from the text or from slides/handouts and homework/programming assignments may be adjusted in class or on Blackboard.

Note: Syllabus may be subject to modification.

Date:	Topics include:	Reading Assignment
6/3	Introduction, Syllabus, Overview of C HW # 1 assigned	lecture notes & ch 1,2
6/5	Overview of C *continued*, vi editor, compilation platforms	lecture notes & ch 3,4,5
6/10	Top-down Design with Functions, Selection Structures, Repetition and Loops, Logical Operators, Modular Programming **HW # 1 due** HW # 2 assigned	lecture notes & ch 3,4,5
6/12	Pre/Post Increment Operators, POSIX, User-defined functions, Function Prototypes, Arrays, Pointers	lecture notes & ch 6
6/17	User-defined functions, Arrays, Pointers *continued*	lecture notes & ch 6
6/19	Character Arrays and Strings, Reference and Dereference Operators **HW # 2 due** HW # 3 assigned	lecture notes & ch 7,8
6/24	The ASCII Character Set, Structures, Unions, Unix Time, Debugging Techniques	lecture notes & ch 9,10
6/26	Recursion, Text and Binary File Processing **Midterm Exam**	lecture notes & ch 11
7/1	Scope Rules for C Variables, Array of Structures, **HW # 3 due** HW # 4 assigned	lecture notes & ch 12
7/3	Command Line Arguments, Programming in the Large, Makefiles, Compilation of multiple files	lecture notes & ch 12
7/8	File I/O *continued*, Command Line Arguments *continued*, Pointers to Structures	lecture notes & ch 13
7/10	Dynamic Data Structures	lecture notes & ch 13
7/15	Linked Lists continued , Bitwise Operators	lecture notes C-3, C-4
7/17	**HW # 4 due** Linked Lists continued, Bitwise Operators *continued*	lecture notes
7/22	Advanced Topics (time permitting)	lecture notes
7/24	Review and practice	

Final Exam (cumulative) Fri. 7/26 4:30 pm – 7:15 pm

OTHER POLICIES

General Course Policies

- Policy on electronic devices (cell phones, pagers, computers, etc.): **MUST be turned off or on silence during clas**s.

University Requirements

- Academic Honesty: https://oai.gmu.edu/mason-honor-code/
- Disability Statement: http://ods.gmu.edu.

ACADEMIC INTEGRITY

GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

GMU EMAIL ACCOUNTS

Students must activate their GMU email accounts to receive important University information, including messages related to this class. You should understand that your emailbox may be full, so check your email and make sure you have enough space daily.

OFFICE OF DISABILITY SERVICES

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. http://ods.gmu.edu

OTHER USEFUL CAMPUS RESOURCES:
WRITING CENTER: A114 Robinson Hall; (703) 993-1200;
http://writingcenter.gmu.edu
UNIVERSITY LIBRARIES Ask a Librarian
http://library.gmu.edu/mudge/IM/IMRef.html

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS):
(703) 993-2380;
http://caps.gmu.edu

UNIVERSITY POLICIES
The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university affairs.