Syllabus: CS 240 Programming in C (Fall 2024)

Time: Tue & Thu
- Section CS240-01: 5:30PM – 6:45PM (Wheatley W01-0005)
- Section CS240-03: 7:00PM – 8:15PM (Wheatley W01-0004)

Instructor: Prof. Duc Tran (duc.tran@umb.edu, office: McCormack M3-0201-18)
Office hours: Tue & Thu 3:00PM – 5:15PM

My email to the class will be sent from the WISER system, so make sure that your email address is set up correctly with WISER. You should also visit the website regularly

Topics

CS 420 is an introductory course, teaching you how to write, execute, and debug C-language programs. We will cover the first 7 chapters of the Kernighan & Ritchie book, and Chapter 8 if time permits. Topics include: introduction to C; types, operators, and expressions; control flow; functions and program structure; pointers and arrays; data structures; input and output.

Prerequisites
- CS110 (at least C-) or CS115L

Textbook
- *The C Programming Language.* Kernighan & Ritchie. 2nd edition. Prentice-Hall.

Grading

A lot of practice is required in this class. There will be 5 homework assignments, 3 tests, and 1 final exam. Your final grade is calculated as follows:

- Homework (25% of final grade): There are 5 homework assignments, each worth 5% of the total grade. Each assignment is a coding challenge which requires writing a C program to solve a programming problem.
- Test 1 (15% of final grade, in-class): Paper written test + Computer coding test
- Test 2 (15% of final grade, in-class): Paper written test + Computer coding test
- Test 3 (15% of final grade, in-class): Paper written test + Computer coding test
- Final Exam (30% of final grade, in-class): to be determined by the University (will be available on Wiser)

Threshold (%)	93	90	87	83	80	77	73	70	67	63	60	<60
Letter grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

Late Homework and Makeup Policies
- No makeup is granted for students missing a homework assignment or an exam. Exceptions are possible only if there is a good reason with justifying evidence, e.g., due to illness.
- Homework may be submitted late by no more than 24 hours, weekend and holiday counted. The penalty for late submission is 10% of the homework grade.

Accommodations

The University of Massachusetts Boston is committed to providing reasonable academic accommodations for all students with disabilities. This syllabus is available in alternate format upon request. Students with disabilities who need accommodations in this course must contact the instructor to discuss needed accommodations. Accommodations will be provided after the student has met with the instructor to request accommodations. Students must be registered with the Ross Center for Disability Services, CC UL 211 (617.287.7430) before requesting accommodations from the instructor. http://www.umb.edu/academics/vpass/disability/. After

registration with the Ross Center, a student should present and discuss the accommodations with the professor. Although a student can request accommodations at any time, we recommend that students inform the professor of the need for accommodations by the end of the Drop/Add period to ensure that accommodations are available for the entirety of the course.

Academic Integrity and Code of Student Conduct

It is the expressed policy of the University that every aspect of academic life not only formal coursework situations, but all relationships and interactions connected to the educational process shall be conducted in an absolutely and uncompromisingly honest manner. The University presupposes that any submission of work for academic credit indicates that the work is the student's own and is in compliance with University policies. In cases where academic dishonesty is discovered after completion of a course or degree program, sanctions may be imposed retroactively, up to and including revocation of the degree. Any student who reasonably believes another student has committed an act of academic dishonesty should inform the course instructor of the alleged violation. These policies are spelled out in the Code of Student Conduct. Students are required to adhere to the Code of Student Conduct, including requirements for academic honesty.

Link: UMB Code of Student Conduct
You are encouraged to visit and review the UMass website on Plagiarism: Plagiarism Prevention & Awareness: Home

Course Schedule (Topics, Homework Assignments, Tests)
We follow the textbook closely.

- Week 1: Chapter 1 – part 1
    - 1.1 Getting Started
    - 1.2 Variables and Arithmetic Expressions
    - 1.3 The For Statement
    - 1.4 Symbolic Constants
    - 1.5 Character Input and Output
- Week 2: Chapter 1 – part 2 (HOMEWORK 1 will be given this week)
    - 1.6 Arrays
    - 1.7 Functions
    - 1.8 Arguments-Call
    - 1.9 Character Arrays
    - 1.10 External Variables and Scope
- Week 3: Chapter 2 – Types, Operators, Expressions (HOMEWORK 2 will be given this week)
    - 2.1 Variable Names
    - 2.2 Data Types and Sizes
    - 2.3 Constants
    - 2.4 Declarations
    - 2.5 Arithmetic Operators
    - 2.6 Relational and Logical Operators
    - 2.7 Type Conversions
    - 2.8 Increment and Decrement Operators
    - 2.9 Bitwise Operators
    - 2.10 Assignment Operators and Expressions
    - 2.11 Conditional expressions
    - 2.12 Precedence and Order of Evaluation
- Week 4: Chapter 3 – Control Flow (TEST 1 will be given this week)
    - 3.1 Statements and Blocks
    - 3.2 If-Else
    - 3.3 Else-If
    - 3.4 Switch
    - 3.5 Loops- While and For

- o 3.6 Loops- Do-while
- o 3.7 Break and Continue
- o 3.8 Goto and Labels
- Week 5: Chapter 4 – Functions and Program structures
  - o 4.1 Basics of Functions
  - o 4.2 Functions Returning Non-integers
  - o 4.3 External Variables
  - o 4.4 Scope Rules
  - o 4.5 Header Files
  - o 4.6 Static Variables
  - o 4.7 Register Variables
  - o 4.8 Block Structure
  - o 4.9 Initialization
  - o 4.10 Recursion
  - o 4.11 The C Preprocessor
- Week 6, 7, 8: Chapter 5 – Pointers and Arrays (TEST 2 will be given in Week 8)
  - o 5.1 Pointers and Addresses
  - o 5.2 Pointers and Function Arguments
  - o 5.3 Pointers and Arrays
  - o 5.4 Address Arithmetic
  - o 5.5 Character Pointers and Functions
  - o 5.6 Pointer Arrays; Pointers to Pointers
  - o 5.7 Multi-dimensional Arrays
  - o 5.8 Initialization of Pointer Arrays
  - o 5.9 Pointers vs. Multi-dimensional Arrays
  - o 5.10 Command-line Arguments
  - o 5.11 Pointers to Functions
  - o 5.12 Complicated Declarations
- Week 9, 10: Chapter 6. Structures (HOMEWORK 3 will be given in Week 9)
  - o 6.1 Basics of Structures
  - o 6.2 Structures and Functions
  - o 6.3 Arrays of Structures
  - o 6.4 Pointers to Structures
  - o 6.5 Self-referential Structures
  - o 6.6 Table Lookup
  - o 6.7 Typedef
  - o 6.8 Unions
  - o 6.9 Bit-fields
- Week 11, 12: Chapter 7. Input and Output (HOMEWORK 4 will be given in Week 11, TEST 3 in Week 12)
  - o 7.1 Standard Input and Output
  - o 7.2 Formatted Output - Printf
  - o 7.3 Variable-length Argument Lists
  - o 7.4 Formatted Input-Scanf
  - o 7.5 File Access
  - o 7.6 Error Handling-Stderr
  - o 7.7 Line Input and Output
  - o 7.8 Miscellaneous Functions
- Week 13, 14: Chapter 8. The UNIX System Interface (HOMEWORK 5 will be given in Week 14)
  - o 8.1 File Descriptors
  - o 8.2 Low Level I/O-Read and Write
  - o 8.3 Open, Create, Close, Unlink
  - o 8.4 Random Access- Lseek
  - o 8.5 Example - An Implementation of Fopen and Getc
  - o 8.6 Example - Listing Directories
- Week 15
  - o Course review and practice for final exam