

[CS 240: Programming in C](#)

Spring 2022

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**Class:**

LE2: Monday/Wednesday 10:30am, STEW 130

LE1: Monday/Wednesday 12:30pm, STEW 130

**Course Web Page:**

<https://endor.cs.purdue.edu/~cs240/>

**Course Newsgroup:**

<https://campuswire.com/p/GF2B23BDA>

Access code 8149

**Instructor:**

Dr. Jeff Turkstra, HAAS 128, [jeff@purdue.edu](mailto:jeff@purdue.edu), 49-63088.

**Office Hours:**

Monday, 1:30pm – 2:30pm

Tuesday, 10:00am – 11:30am

Thursday, 1:00pm – 2:30pm

**Teaching Assistants:**

This course has thirteen graduate teaching assistants as well as a number of undergraduate teaching assistants. The names and email addresses for the GTAs are given below.

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Head TAs:

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**Text:***Required*

The C Programming Language (2<sup>nd</sup> ed); Kernighan and Ritchie; Prentice Hall, March 1988

ISBN-13: 978-0131103627

*Recommended*

Beej's Guide to C Programming; Brian "Beej" Hall; 2007

<https://beej.us/guide/bgc/>

**Prerequisites:**

Problem Solving and Object-Oriented Programming – CS 18000

Programming proficiency is required

**Course Outcomes:**

A student who successfully fulfills the course requirements will:

1. be able to read and write C programs that use files, both binary and text I/O
2. be able to read and write C programs that use structures
3. be able to read and write C programs that use dynamic data structures. This outcome encompasses the following concepts:
  - pointers
  - memory allocation and management
  - linked lists and trees

**Lecture:**

You are expected to watch all lecture videos. Quizzes will be given for randomly selected class sessions. If you must miss a lecture, you are responsible for procuring any material, information, handouts, announcements, etc., that you missed.

**Preparation for Lectures:**

You should try to read over the relevant pages in the course text before lecture. Additionally, you are expected to check your email, the course website, and the course newsgroup regularly. Here is the *tentative* lecture schedule:

Wk	Lec	Subject
1	1	Course Introduction
	2	Compiling, Object Files, Linking, and Execution
2	X	Martin Luther King Jr. Day (No Lecture)
	3	File I/O
3	4	More File I/O
	5	assert(), Random-access File I/O
4	6	typedef, Introduction to Structures, return
	7	Definition vs. Declaration, Arrays, Memory Layout of Data
5	8	Memory Layout of Data, Binary File I/O
	9	Bitfields, Unions, Enums, and Bitwise Operations
6	10	Introduction to Pointers
	11	More Pointers, Debugging Introduction
8	12	Address-of Structures, . and -> Operators, malloc() and free()
	13	Linked Lists
8	X	No Lecture (Exam Makeup)
	14	Doubly-Linked Lists, Pointers to Pointers

9	X	Spring Break (No Lecture)
	X	Spring Break (No Lecture)
10	15	Pointer Review, The Many Faces of Zero, Pointers to Functions
	16	Pointers to Functions, Recursion
11	17	Trees
	18	Types, Type Qualifiers, Storage Classes, and The C Preprocessor
12	19	Casts, void, and Callbacks
	20	Efficiency Issues, Libraries, and Large-scale Development
13	21	Random Number Generation, Graphical Programming
	22	Buffer Overflows, System Calls
14	X	No Lecture (Exam Makeup)
	23	More Buffer Overflows, System Calls and Assembly, Core Files and goto
15	24	Hardware
	25	Makefiles, Bubble Sort, and Networking Basics
16	26	Networking Wrap-up
	27	The End

### Lab Sessions:

There are no formal labs for this course. Lab times are opportunities to work on the homework and ask questions. Attendance is optional.

### Quizzes:

There will be a number of unannounced quizzes during lecture. They will be due no later than 24 hours after the end of lecture. A score of zero will be given in case of no submission. Quizzes are worth 25 points.

### Homework:

Homework assignments are assigned usually one per week and are due the following week. These are C programs that are submitted electronically. To ensure success, **compile your code on a Linux system, like data.cs.purdue.edu (even remotely), with GCC and only GCC.** For full credit, your code must follow the code standard established for this course (graded as style points). The course webpage has the code standard and examples.

Other important notes on homework:

1. ALL HOMEWORK ASSIGNMENTS ARE DUE AT 9:00 PM on Tuesday of the week it is due (with some occasional exceptions).
2. If you feel you have a valid reason for not having your work done on time, then send one of the TAs an email **BEFORE** the assignment is due.
3. Don't wait until the last minute. If the computer goes down so does your grade.
4. Down time and crashes of the computer network are, in general, NOT valid excuses for late or missed assignments.

### Examinations:

Exams will be closed book and closed notes. You must solve the exam problems yourself, without any help (knowing or unknowing) from any other student. You must not seek any knowledge in advance of the test questions (beyond that given in class) and must report any advance knowledge of the test questions by any student that you are aware of. You must not allow any other student access to your solutions during the exam. If the seating situation makes this difficult, please inform the instructor or TAs.

Midterm Exam I: Monday, February 28 8:00pm  
Midterm Exam II: Monday, April 11 8:00pm  
Final: TBD

### **Regrades:**

Problems regarding grading of assignments and the exam must be resolved within **one week** after the graded work has been returned to you. It is your responsibility to pick up the graded work on time. Grades will not be modified after the one week period.

### **Late Submissions:**

A penalty of 5% per quarter hour will be charged to all assignments submitted after 9:00 pm on the day the assignment is due. No assignment will be accepted after 11:59 PM on the due date.

### **Make-up Examination Policy:**

Make-up exams will be given only in the **most extreme** circumstances and require certification for such circumstances. Eg, a medical doctor's statement certifying that the student is **unable** to attend the scheduled exam. Any travel (including interview trips), load from work or from other classes, failed alarm clocks, or simply not being able to make it to the exam will **not** be grounds for a make-up. If you have any recurring medical problems that may unexpectedly prevent you from making it to class or exams, please obtain a doctor's statement certifying your circumstance.

### **Extensions:**

Because of the extended length of time provided for quizzes and homeworks, extensions are typically only granted in extreme cases and only for university-approved reasons. These include serious illness, family emergency, and official university commitments. In all cases, some form of evidence or documentation must be provided. If the absence is planned (band trips, course field trips, etc.), you must inform your instructor ahead of time. Failure to do so will result in the absence being unexcused.

### **Academic Integrity:**

As a student at Purdue you are subject to the [Purdue University Student Code of Conduct](#), which enjoins you to respect the highest standards of honesty and integrity. All work that you submit in this course must be your own; unauthorized group efforts are considered academic dishonesty. See the online brochure [Academic Integrity: A Guide for Students](#) for definitions and sanctions. Academic dishonesty is a serious offense which may result in suspension or expulsion from the University. In addition to any other action taken, such as suspension or expulsion, a **grade of F** will normally be recorded on the transcripts of students found responsible for acts of academic dishonesty. Students are encouraged to report academic dishonesty to the instructor directly, or to the Office of the Dean of Students.

You may discuss assignments in a general way with other students, but you may not consult anyone else's work. Among other ways to get an F, you are guilty of academic dishonesty if:

- You examine another student's solution to an assignment
- You allow another student to examine your solution to an assignment
- You fail to take reasonable care to prevent another student from examining your solution to an assignment and that student does examine your solution. For example,

if you allow another student to check his/her email from your terminal while you step out of the room, you have failed to take reasonable care to prevent him/her from accessing your files.

- You submit an assignment that is not completely your own work
- You share results or notes during quizzes or exams

All work is subject to computer-based comparison and analysis. Do not con yourself into thinking that you can hide any collaboration. The risk of getting caught is too high, and the standard penalty is way too high.

If we find reason to believe that a student or team has cheated on any assignment, we may inform the student or team promptly, or we may decide to silently accumulate evidence against the student or team on later assignments.

### **Grading:**

Your course grade will be based on your performance in quizzes, homework assignments, and the project, weighted in the following manner:

Quizzes and Homework: 50%

Two Midterms: 14% each

Final Exam: 22%

### **Questions and Answers:**

Questions of general interest should be posted on the course newsgroup. Answers will be posted as soon as possible. Questions of specific interest should be directed to the appropriate TA via email. Answers will be sent to you directly. If you need to contact a specific TA or instructor, send email to that individual or go see him/her during office hours.

### **Pandemic Precautions:**

Every student is expected to be familiar with, and follow, all relevant university policies and requirements related to the current pandemic. This information is available at:

<https://protect.purdue.edu/>

Students are required to wear masks at all times when inside and when social distancing is not possible. Anyone that does not follow this policy will be asked once to rectify the situation. Failure to do so immediately will result in a score of 0 for that week's homework assignment and a referral to the Dean of Students. Subsequent failures will result in 0s for the following assignments.

### **Modifications:**

This syllabus may be modified at any time with notification.

*\*\*\* As an interesting side note, a significant portion of this syllabus is copied from Dr. Rodriguez-Rivera's, Dr. Dunsmore's, Dr. Hosking's, Dr. Brylow's, and Dr. Hu's policy pages from previous semesters. One of the major differences between plagiarism and proper reuse is giving credit where credit is due. \*\*\**