

# PURDUE UNIVERSITY

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## [CS 240: Programming in C](#)

Fall 2020

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**Class:**

Tuesday/Thursday, Asynchronous online no later than 3:30pm.

**Course Web Page:**

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

**Lecture Videos:**

<https://mediaspace.itap.purdue.edu/channel/Fall-2020-CS-240-Turkstra/176540441>

**Course Newsgroup:**

<https://campuswire.com/p/G94E0AD1A>

**Course Chat:**

<https://endor.cs.purdue.edu/irc/>

**Instructor:**

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

**Office Hours:**

TBD

**Teaching Assistants:**

This course has eleven 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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Eman S. Diyab	<a href="mailto:ediyab@purdue.edu">ediyab@purdue.edu</a>
Kevin Lee	<a href="mailto:lee1845@purdue.edu">lee1845@purdue.edu</a>
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Anxhelo Xhebraj	<a href="mailto:axhebraj@purdue.edu">axhebraj@purdue.edu</a>
Geyan Zheng	<a href="mailto:zheng313@purdue.edu">zheng313@purdue.edu</a>

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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:

<b>Wk</b>	<b>Lec</b>	<b>Subject</b>
1	1	Course Introduction
	2	Compiling, Object Files, Linking, and Execution
2	3	#include, File I/O
	4	More File I/O, access(), feof(), ferror(), clearerr()
3	5	assert(), Random-access File I/O
	6	typedef, Introduction to Structures, return
4	7	Definition vs. Declaration, Arrays, Memory Layout of Data
	8	Binary File I/O
5	9	Bitfields, Unions, and Enums
	10	Introduction to Pointers
6	11	More Pointers, Debugging Introduction
	12	Address-of Structures, . and -> Operators, malloc() and free()
7	13	Brief calloc(), Linked Lists
	14	Doubly-Linked Lists, Pointers to Pointers

8	15	Pointer Review, The Many Faces of Zero, Pointers to Functions
	16	Pointers to Functions, Recursion
9	17	Trees
	18	Bitwise Operations, Memory Access
10	19	Types, Type Qualifiers, Storage Classes, Structure Alignment
	20	C Preprocessor, Casts
11	21	void, Callbacks, Efficiency Issues
	22	Libraries, Large-scale Development
12	23	Random Number Generation, Graphical Programming
	24	Buffer Overflows, System Calls
13	25	More Buffer Overflows, System Calls and Assembly, Core Files and goto
	26	Interfacing with Hardware
14	27	Makefiles, Bubble Sort, and Networking Basics
	28	Networking Wrap-up, 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 (physical or virtual) is optional.

Equivalent virtual resources are available during all lab times. You are strongly encouraged to utilize them. Physical presence in campus labs is unnecessary. Should you find yourself considering attending a lab in person, please remember that you are exposing not just yourself, but others to greater risk.

### Quizzes:

There will be a number of unannounced quizzes during lecture. They will be due no later than 48 hours after the release of the lecture video. 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](http://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 Wednesday 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.

### Project:

There will be one capstone project for the course worth 30% of your grade. This project will include a number of progress checkpoints. A detailed distribution of points will be included with the project specification. As always, you are expected to work alone.

**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.

**Extensions:**

Because of the extended length of time provided for quizzes, homeworks, and the project, 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: 70%

Project: 30%

**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. \*\*\**