

Welcome to C Programming Lab!

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Introduction

C Programming is the first programming laboratory in iMTech curriculum. Topics include, but are not limited to, the basics of programming, debugging, and testing. Additionally, students will learn about the *Linux* operating system and editing.

Office Hours and Appointments

Dr. Madhav Rao, 112 IIITB, mr@iiitb.ac.in
Office Hours: Monday - 11 AM to 1 PM

TA: Vivek Yadav and Putluru Sravani

Vivek and Sravani will be your TA for this course. You can reach them via email ids: *vivek.yadav@iiitb.org* and *sravani.juhi@iiitb.org*.

Editors

An *editor* is a word processor for programmers and is used by programmers to write and modify *source code*. Source code refers to the words and punctuation that computer programs start out as. With regards to editing, a programmer's primary concerns are entering source code quickly and modifying source code even more quickly. There are two great and timeless editors geared especially for proficient programmers: *emacs* and *vi* (nowadays *vim*). In this class, you will learn *vim* (although you can also choose to learn *emacs* if you wish). To run the *vim* tutorial, type the command:

```
vimtutor
```

at the system prompt. To exit a *vim* session, type ZZ to save your changes and quit and :q or :q! to quit without saving changes.

You will also learn the Linux operating system. Linux is an open-source version of the UNIX operating system. UNIX was designed by programmers for programmers.

Here are some web tutorials:

- vi cheat sheet
- Quick vi tutorial
- linux cheat sheet
- Quick linux/unix tutorial
- more Unix/Linux info
- emacs reference card
- quick emacs tutorial

Exams

There will be two practical exams: Mid-Term and a Final Exam. Mid-Term exams are tentatively scheduled on Sept-25 to Oct-1. Final exams are tentatively scheduled on Dec-9 to Dec-13.

Quizzes and Assignments

Quizzes/Assignments will be held/due every week. The due date will be announced in the class or in LMS forum.

Projects

Students in group of five can work on a project. Normally students will be given a project by an instructor. However students can come up with their own project. But they need to discuss with the instructor in the first week of the November. The project will be assigned to students a month before they are due. The project will test the group of students skills on C Programming language used for different applications such as robotics, communication and others.

Catalog Statement

An introductory course on programming. Language concepts: datatypes, expressions, variables, control flow, functions, recursion, arrays, pointers, structures, and unions. Software engineering concepts: testing and debugging. System concepts: directories, paths, files, and text editing.

Course Summary

This course introduces C, an important system level programming language. Using C, students will learn the basics of programming, including the designing, writing, testing, and debugging of programs. In addition, students will learn basic system tasks for the purposes of organizing and maintaining a suite of C programs.

Course Objectives

At the end of this class, a student should understand the concepts of:

- *defining, using, and modifying variables*
- *formulating expressions to represent desired quantities*
- *controlling the execution of code within a program*
- *defining and calling functions*
- *generating thorough test suites*
- *primitive debugging skills to solve semantic program faults*
- *organizing code using system utilities*

Textbook

The recommended textbooks are

- *The C Programming language* by Kernighan and Ritchie.
- *How to solve it by Computers* by Dromey
- *Code Complete* by McConnell

C Programming lab		
	Topic	hours
	Introduction to Vim	2
	Introduction to Linux and Programs	2
	Datatypes and expressions	3
	Control Flow	3
	Defining and Calling Functions	3
	Recursion	3
	Arrays	3
	Pointers	3
	More on pointers	3
	Structures	3
	Advanced structures and unions	2
	File I/O	3
	C in Object Oriented way	3
	Group project	8
	Total Hours	44

Additionally, students are encouraged to visit the following links to understand more on unix enviroment and vim editing skills.

- Text-editing <http://heather.cs.ucdavis.edu/matloff/UnixAndC/Editors/>

- Directories and paths <http://www.ee.surrey.ac.uk/Teaching/Unix/>
- Manipulating files <http://www.ee.surrey.ac.uk/Teaching/Unix/>

Grading

Grades will be determined by the following percentages:

Percentage	Task
25%	Mid-term practical exam
25%	Final Practical Exam
30%	Activities demonstration, Programming assignments, and final group project
20%	Quizzes

Unexcused absence will result in losing of 2 points from the overall grade. For exams, grading is based upon the straight scale percentage of successfully completed problems. For programming assignments, points are awarded with respect to how well the program performs against a test suite.

Other Details

Please be in your seat by the beginning of class. There is to be no food or drink in the classroom. Sleep is allowed only in the event of a stultifyingly boring lecture. Being caught reading a newspaper, using the computer for purposes other than the class or texting on a cell phone will count as half an unexcused absence (losing 1 point from the overall grade). Schedule changes, assignment clarifications, and such will be announced via the LMS forum.

Programming assignments are to be submitted electronically by 11:59:59 AM. on the day specified by the instructor. Programming activities also needs to be submitted after properly demonstrating the activity to either your instructor or class TA. Students are requested to use *submit* command to submit the assignment electronically as follows:

```
submit clab mr <assignment-name> <email-address>
```

where assignment-name could be assign0, assign1....and so on.. and email-address is your iitb email address. If you use your other email accounts, the submissions will fail and you will be responsible for non-submission. If your assignment looks as if you have plagiarized someone else's assignment, both assignments will be forwarded to the Director of the IIITB. Further you will be considered guilty of plagiarism. Students assignments, and activities will be checked for plagiarism using *moss*, a stanford university open source software. The minimum punishment requested for plagiarism, or any other academic misconduct, is dismissal from the class with a failing grade. You are required to protect your work from plagiarism. If your work is plagiarized, it will be assumed that you were a willing participant in the plagiarism and you will receive the same punishment as the plagiarist, absent evidence to the contrary. Interaction with fellow classmates on programming assignments and project is encouraged, but there should be no sharing of code or solutions, only an exchange of high-level ideas. Do not share your code or email your code to fellow classmates, this can be tracked and you will be punished severely based on this conduct.

Attendance is required. For each absence, your final percentage will suffer a deduction of 2 points. Thus, five absences beyond the first will lower your score by 10 points. Even one absence beyond the first will likely lower your final grade a plus/minus value. An absence will be excused if you alert your instructor prior to the start of the class you will be missing and then provide a written, institute authorized excuse in the subsequent class.