# CS6150: Advanced Programming

July Nov. 2025

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## 1 Practical Aspects

Class Timings:

- Theory (M2 slot): Monday 3.30PM-4.45PM in CS15
- Lab: Friday 2.00PM-4.45PM in DCF
- 05-09-25 (Friday) is a holiday and we will have a compensation lab on a convinient date.

Course Instructors:


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TA Team:

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## 2 Course objectives

The objective of the course is to teach students advanced problem solving through programming. It aims to train students in writing efficient C++ programs. The expected outcomes are that the students will learn to:

- Understand OO design concepts like classes, objects, inheritance, interfaces.
- Use libraries (such as STL) efficiently.
- Identify and abstract the programming task involved for a given programming problem.
- Select appropriate data structures and algorithmic paradigms (such as greedy, dynamic programming, divide and conquer etc.).

## 3 Course prerequisite(s)

Highly recommended to take CS5800 in parallel. The second half of this course will be based on the topics covered in CS5800.

## 4 Course Requirements

You are *required* to attend all the labs and Theory classes. In the Theory class on every Monday we will discuss the topics on which you will have programming assignments in the lab on the Friday of that week.

Except for the first week, all other labs will be evaluated. So if you miss any of the lab, you will not be evaluated for that lab.

## 5 Planned Topics for the Lab

The programming assignments will broadly cover the following topics:

- Basics of C++ : Concepts of Class-Objects, Constructors and Destructor, Abstraction, Polymorphism, Inheritance, Templates, Vectors, Maps, Standard Template Libraries
- Algorithms : Graph Algorithms, and problems based on various algorithmic paradigms like greedy, dynamic programming, divide and conquer etc.

All details and announcements will be posted on the moodle page of this course.

## 6 Grading Policy

Following is the proposed grading policy (subject to class committee approval).

### 6.1 Evaluation in each lab

There will be a total of 11 Labs excluding Midsem and End sem exams. Each lab except the first Lab will be evaluated for – 7% (Total 70%). In every lab, out of 7%, at least 3% will be dedicated for in-lab evaluation.

- Deadlines and Penalties: The in-lab component is to be submitted as soon as the lab is over (at 4.45PM on Friday). Late submissions for the in-lab component will not be evaluated. The remaining 4% in each lab is to be submitted before $12.00PM$ on Saturday every week. Late submission are allowed only till $8PM$ on Saturday and will have a penalty of 30%.
- How to submit : The lab will be run on Haker-rank and the code is to be submitted as a single file on the interface in which you will do the programming. Additionally the code should also be submitted on the moodle along with any other questions asked in that lab (like design of your code etc.).
- The marks for Friday's lab will be available before the next lab session. If you have any queries you can contact the TA within three weeks from the date of the lab session to request for regrading. No queries will be allowed after three weeks of the lab.

### 6.2 Exams

We will have Mid Semester Exam on 19-09-25 and End Sem Exam on 07-11-25, both of which will be evaluated for 15%.

If someone has missed a lab for some genuine reason, their make up for that particular lab will also be included in the Mid Sem or End Sem Exam (and will be scaled proportionately).

## 7 Academic Honesty

Academic honesty is expected from each student participating in the course. NO sharing (willing, unwilling, knowing, unknowing) of programming code between students, submission of downloaded code (from the Internet, Campus LAN, or anywhere else) is allowed.

Academic violations will be handled by IITM Senate Discipline and Welfare (DISCO) Committee. Typically, the first violation instance will result in ZERO marks for the corresponding lab and a drop of one- penalty in overall course grade. The second instance of code copying will result in a 'U' Course Grade and/or other penalties. The DISCO Committee can also impose additional penalties.

Please protect your Moodle account password. Do not share it with ANYONE. Do not share your academic disk drive space on the Campus LAN.