CS1200: Discrete Mathematics for Computer Science

Semester: Jan-May 2023 (in practice: Mar-Jun 2023)
Classroom: SSB 134/135
Slot: A (Mon 8 AM; Tue 1 PM; Thu 11 AM; Fri 10 AM)

Updated on March 31, 2023

1 Digital Communication Channels

- Course webpage: `https://sites.google.com/view/nishadkothari/teaching/cs1200-2023`
  Topics covered in each lecture will be listed here (after the lecture, on the same day).
- Moodle: `https://coursesnew.iitm.ac.in/course/view.php?id=1255`
  We will use Moodle for Discussions (related to the course material and logistics), for submitting assignments, and for returning evaluations (marks + feedback).
- We will use Moodle as well as WhatsApp for course related announcements. To join the WhatsApp group, send a WhatsApp message to the instructor; check your smail to find the mobile number.
- Students are strongly encouraged to use Moodle for any discussions pertaining to course content, and they are encouraged to post messages publicly so that other students may benefit. Only for personal matters, students may email the TAs or the course instructor. Only for sensitive/urgent personal matters, students may send WhatsApp messages to the course instructor.

2 Course Staff Details

Name	Email Address
Nishad (Instructor)	nishad@cse.iitm.ac.in
Nagashri (Lead TA)	cs21d004@cse.iitm.ac.in
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Swetha (TA)	cs22m089@smail.iitm.ac.in

3 Lectures, Tutorials & Contact Hours

Lectures (by instructor) and tutorials (by TAs) will be held during Slot A:
Mondays 8 AM, Tuesdays 1 PM, Thursdays 11 AM and Fridays 10 AM.
The current plan is to conduct a tutorial every alternate Tuesday.

Students are expected to attend lectures and tutorials. Institute's attendance policy will be applied. Students who regularly miss lectures and/or tutorials will be contacted directly by the instructor.

Contact Hours will be held by the instructor on Tuesdays from 4 to 5:30 PM at SSB 404.
Contact Hours will be held by 3-4 TAs on Mondays and Fridays from 4 to 5:30 PM at TBD.
Students are strongly encouraged to attend Contact Hours to resolve all of their queries and doubts.

4 Objectives

Discrete Mathematics is relevant to, and finds applications in, almost all areas of Computer Science and Engineering, as well as other disciplines (such electrical engineering, economics, bioinformatics, etc.).

The focus of this course is on the theoretical aspects, and not so much on the applications (many of which would be covered in future/subsequent courses).

Having a strong foundation in Discrete Mathematics will turn out to be extremely helpful in almost all of your future CSE courses.

This course has several objectives — some of which are listed below:

- To introduce students to a variety of mathematical structures (or, as we like to call them jokingly, mathematical creatures), to prove interesting properties of these structures, and to establish connections between them.
- To introduce the necessary mathematical formalism, and to train students in the mathematical thought process, that is required to discover and write rigorous proofs (of mathematical statements).
- To train students in the writing of rigorous proofs, and to train them in identifying incorrect proofs (of mathematical statements).
- (An ambitious goal.) To deliver the joy of doing mathematics (in particular, that of discovering proofs).

5 Textbooks and Reference Books

	Title	Authors	Publisher	Year
Textbook	Discrete Mathematics and its Applications	Kenneth H. Rosen	Tata McGraw Hill	2007
Reference	Invitation to Discrete Mathematics	Jiří Matoušek & Jaroslav Nešetřil	Oxford University Press	1998
Reference	Elements of Discrete Mathematics	C. L. Liu	McGraw Hill	1985
Reference	Concrete Mathematics	Ronald Graham, Donald Knuth & Oren Patashnik	Pearson Education	1996
Reference	Combinatorics: Topics Techniques, Algorithms	Peter J. Cameron	Cambridge University Press	1996
Reference	Topics in Algebra	I. N. Herstein	Wiley	1975

6 Syllabus

The course syllabus is divided into four modules (with tentative timelines) as follows:

Module	Tentative duration
Discrete Structures	3.5 weeks
Logic & Proofs	4 weeks
Counting	3.5 weeks
Algebraic Structures	3 weeks

7 Evaluations & Weightage

Type	Date	Weightage
4 Assignments	One at the end of each module. 10 days to submit.	10%
Quiz-1	17 April (Monday) @ 8 AM	25%
Quiz-2	22 May (Monday) @ 8 AM	25%
End Sem Exam	23 June (Friday) @ TBD	40%

8 Academic Honesty

You may work on each assignment in groups of 1 to 2 students. For each assignment you **must** list the name of your group member (if applicable). However, that being said, you must type/write the responses completely independently, and in your own words. You may **not** discuss assignment problems with anyone who is not a fellow student taking the same course. Failing to list the group members will be considered to be a case of academic dishonesty.

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 component of the Course Grade. **The second violation instance will result in FAILING the course.** The DISCO Committee may also impose additional penalties.