Semester 3 Academic Talk

CSEA IITG

CPI

- Some seniors might have suggested to you that CPI is not very important. Trust us, they're wrong. It does unfortunately/fortunately carry a reasonable weight.
- If you have a low CPI right now (below 7), we suggest you try your best to raise it above 7/7.5. It isn't guaranteed that you will be successful in raising your CPI but if you don't even try, you definitely won't be successful.
- This can be done by regularly attending classes (watching all videos), self study, solving tutorials and book problems.
- Those who have a high CPI (8.5+), try to stay above 8 if not 9.
- It is not the end of the world if you have a low CPI but it is much preferable for you to put in efforts to raise it.
- Useful for higher studies and research internships.
- Also serves as a barrier or cut off in the intern season.
- Generally most of the companies didn't have any cpi cut off but few had and it was around 8-8.5, and two companies had 9 as the cut off.

Elementary Number Theory and Algebra

- This course is pretty interesting. At least for the first half. It helps solve many CP questions. We recommend you invest time into this course.
- This subject is also very important if you are looking forward to a career in cryptography as it extensively deals with prime numbers and has a special cryptography section.
- In order to score marks, we suggest you to solve many questions and go through many examples. Some questions are picked directly from the prescribed books. Understanding every topic and proof helps derive solutions to exam problems.
- Try to think during the exams. Some questions mentally challenge you.
- The exams were easy and most questions were direct applications of proofs / modified examples

Probability Theory and Random Processes :

- **THIS COURSE IS HARD**. If you don't study enough, you will **fail**.
- You might find a lecture or two in the beginning pretty easy and intuitive but right after that, it starts getting harder with every lecture, at least until the MidSem exam.
- We were required to score 20/100 by the end of the course to pass. Many people failed. If the passing mark was 25, many more would have failed.
- **Studying a night before the exam won't help. You need much more preparation. Aim to gain a decent level** excellence at all the topics in the syllabus a week before the midsem.
- On the day before the midsem, focus on solving problems.
- The tutorials are very good. We were given written solutions to the tutorials. Some questions are directly picked from the tutorials.

- **Make sure you know and understand the solution to every tutorial question before the exam. It could make the difference of passing and failing.**
- Relying on the lecture slides is a bad idea. We suggest you use this link too: https://www.probabilitycourse.com/
- Try to score as high as possible in the quizzes. It's a lot harder to score in the semester exams.
- Very important course if you are going to apply for quant roles in companies.
- One of the important courses which people mention in their CVs.
- Some companies (like Goldman Sachs) ask probability questions during interviews so we recommend learning useful concepts for the long term.

Discrete Mathematics :

- Your professor is known to set hard papers and tough grading. He teaches extremely well so do pay attention in the lectures and be sure to clear your doubts.
- The course is very interesting, especially Graph portion & Combinatorics.
- Some of the theory topics are useful for competitive programming and the course in problem solving in general.
- The subject is divided into three parts:
    - – Logic: This part is weird. You might not fully understand it but you will easily be able to solve questions based on this topic because it is very intuitive. Make sure you answer the questions formally using the language in the lecture notes/lectures. Please get a good read of the lectures.
    - – Graph Theory: This part is very important. This isn't the algorithm part of graph theory in the fact that it doesn't cover traversal. But it does cover some very important properties of graphs like bipartiteness, eulerian trails etc. It does help understand some real world uses of graphs. It does help solve some CP questions
    - – Combinatorics: This part might feel very familiar. Half if it is basically your JEE P&C syllabus. If that was easy for you, this part is a cakewalk. You will have to study some extra stuff though. It shouldn't be an issue since it is very interesting. This part is basically the scoring part of DM (Although, DM in general is one of the scoring subjects).
- In order to ace this subject, solve questions from prescribed books/tutorials if you are given tutorials. Many exam questions are picked directly from the books. Other than that, thoroughly study proofs.
- Our exams were completely MCQ based though.

Algorithms and Data Structures:

- Prof. Deepanjan Kesh is very good at teaching. He does grab attention easily and goes into depth of most topics so students get the best understanding of topics.
- Very important subject. Will start with basic concepts like time complexity and move on to advanced topics.
- Most of these topics are useful in understanding how STL functions/data types work, so it helps gain more proficiency in competitive programming.
- Another way it helps with competitive programming is with different analysis techniques which can help you figure out how long your algorithm will take to run.

- This course is more Data Structures based than Algorithm based. It involves many proofs which are mostly inductive. Questions are more theoretical than practical. The questions could for example ask you to modify a data structure/algorithm taught in class to make it better in some way. A deep understanding of everything taught in class helps in scoring marks.
- This course is very mentally taxing (which could be a good thing) and really makes you think especially when it comes to advanced data structures, hashing and graph theory. The grading of this course is pretty harsh. Finally, questions from these subjects are directly asked in most interviews.
- If you don't study it properly now, you will need to invest quite some time in the summers before the intern season.
- **Please try not to copy solutions of your friends directly because they will detect that in even subjective papers and will penalise you all. Last year 60% CSE department was caught in cheating and was penalised.**

Algorithms and Data Structures Lab

- The lab is usually very challenging and requires thorough understanding of concepts.
- However, last year it was online and relatively easy. Very standard questions were asked in the lab.
- Formatting of output is very important, use spaces, tabs, newline very carefully.
- DO NOT plagiarise or copy directly from websites like GFG, etc. YOU WILL GET PENALISED.

Digital Design

- If you were good at EE101, this subject should not be too hard.
- If not, it could be a little challenging for you.
- Some elements/designs of this course look intimidating at first but once you get hold of the concepts, it becomes easy to understand what is happening in the circuit/chart
- The professors teach very well and the course is quite intuitive and fun
- The grading is also lenient, 110 students received 10 and many received 9 out of 180 students.
- Just submit assignments on time and perform good in quizzes
- Practice the slide examples and problems from the book
- Direct questions from the book came in the quizes.
- You will be taught Verilog which will be used in next sem Hardware Lab course
- **Use some online available calculators**
- **NESO Academy is a good youtube channel resource**

System Software Lab.

- The course has a lot of useful components like shell scripting and latex.
- Try to do the assignments by yourself as they are extensive.
- Don't wait till the last day to finish the assignments as you may not finish on time.
- With little practice, honest efforts and going through theory, this course is easy to ace
- Reports are very important.
- There may be an exam at the end which will be theoretical in nature - that will be the differentiating factor to get a good grade.
- DO NOT plagiarise, you will be caught.