Department of Physics, IIT Kanpur
PHY 421 (Mathematical Methods I), Sem-I, 2025-2026

Instructor: Prof. Tarun Kanti Ghosh (tkghosh@iitk.ac.in, FB352)

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Schedule and Venue: Monday: 12:00-13:15 in DJAC-203H
Tuesday: 8:00-8:50 in L02
Thursday: 12:00-13:15 in L02

Evaluation: Four Assignments: 4 x 5 =20
Two Quizzes: 2 x 15 =30
Mid-sem: 80
End-sem: 120

Total: 250

Syllabus: Syllabus for this course can be found at
https://www.iitk.ac.in/phy/data/PHY-CourseBooklet-18-03-24.pdf

Mid-sem syllabus: Topics covered before mid-sem exam.

End-sem syllabus: $(20\pm\epsilon)$ marks from mid-sem syllabus and $(100 \mp\epsilon)$ marks from the topics discussed after mid-sem exam. Here ($\epsilon \leq 5$).

Course policy:

• **Attendance:** Biometric/App (Acadly) based attendance will be recorded during lectures and tutorials. Minimum 80% attendance is mandatory for appearing end-sem exam.

• **Absent during exams:** Appearance in the end-sem exam or its make-up exam (as per Institute rules) is mandatory to pass this course. Failing to do so will automatically lead to an F grade irrespective of your performance in previous exam components.

• There will be no make-up quizzes/mid-sem exam.

• Marks for missed quizzes and/or mid-sem exam will not be prorated except genuine medical cases.

• **Homework problems:** Homework problem sets of different topics will be sent in a regular interval. Students are advised to work out the HW problems, but do not need to submit solutions of the HW problem sets.

• **Assignments:** Four Assignment problem sets will be sent at suitable times, which students have to submit in **Hello IIT-K** portal before the deadline. Note that e-mail submission of Assignmments will not be accepted. Submission deadline will be extended only if there is any technical problem at the Portal.

The Assignment sets will have problems mostly picked-up from the HW problem sets. Thus working out HW problem sets regularly will help the students to submit the Assignments before deadline.

• **Collaborative study:** Students are encouraged to discuss among yourselves and try to solve the HW problems, but do not copy from your friends while submitting Assignments.

• **Ethics:** We will follow a zero-tolerance policy for academic misconduct, Any academic wrondoing (copying, use of unfair means in exam/quizz, impersonating etc) will be dealt with very strictly.

• **Passing marks:** Minimum marks required to pass this course is 30% (i. e. 75 out of 250).

Text book:

Mathematical Methods for Physicists by G. Arfken and H. Weber.

Reference Books:

Mathematical Physics with Applications, Problems and Solutions by V. Balakrishnan

Complex Variables: Principles and Problem Sessions by A. K. Kapoor

Matrices and Tensors in Physics by A. W. Joshi