CLL110: Transport Phenomena
Course Information Sheet

Department of Chemical Engineering, IIT Delhi
Semester 1, 2025–26

Course Schedule (Slot B)

- **Lectures:** Monday and Thursday, 9:30–10:50 am (LH 408)

- **Tutorials:** Mon, Tue, Thu, Fri (groupwise), 1–2 pm (LH 313.2)

Instructor

- **Prof. Vikrant**
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Course Content

1. Vector and Tensor Analysis

2. Stress tensor and Newton's law of viscosity

3. Basic definitions: Euler/Lagrangian viewpoint of momentum transport, Laminar and turbulent flows, boundary layers and potential flow

4. Shell momentum balances

5. Equation of continuity and Equation of motion

6. Shell energy balances

7. Equations of energy, mechanical energy and thermal energy

8. Shell mass balances

9. Convective-diffusion equation for binary mixtures

10. Solution of heat, mass and momentum equations using similarity transform

11. Velocity, temperature and concentration distribution in turbulent flows

12. Analogies in heat, mass and momentum transfer

Reference Book

Transport Phenomena by R. B. Bird, W. E. Stewart, and E. N. Lightfoot (BSL)

Evaluation Scheme

- Mid Semester Exam: 30%
- End Semester Exam: 40%
- Term Paper / Project: 20%
- Attendance: 10%

You are required to bring the textbook to tutorial classes. Tutorial problems will be given from the textbook.

Attendance Policy

(a) Minimum 75% attendance in both lectures and tutorials is required. Final grade will be reduced by one lower grade if this requirement is not met.

(b) Re-major for conversion of E to D grade will not be allowed if attendance is below 50%.

(c) Self-study will not be permitted if attendance is below 50%.

Bonus Marks

- +1 mark for each lecture attended above 75% (e.g., 7 lectures = 7 marks)
- +0.5 marks for attending each weekly tutorial (14 tutorials = 7 marks including 4 bonus)

Grade Cut-offs

- Minimum marks for pass grade: **30 marks**
- Minimum marks for audit (if applicable): **40 marks**
- Minimum marks for E-grade: **25 marks**