COURSE OUTLINE:
The course is intended to revisit the conservation laws as a primer for the study of the transport phenomena and thermodynamics. Both macroscopic and microscopic approaches in applying these laws will be dealt with. The students will learn how to make mass, momentum and energy balances by going through the course.

ABOUT INSTRUCTOR:
Prof. Sandilya has been teaching at the Cryogenic Engineering Centre of IIT Kharagpur since 2002. He has been offering both core and elective courses on mass transfer, separation processes, LNG, CFD etc. to both UGs and PGs. His research area encompasses process intensification, nonconventional energy, carbon capture, cryogenic storage, catalyst development, hydrogen separation etc.

COURSE PLAN:
Week 01 - 02: Introduction to linear algebra (vectors, tensors, and matrix operations)
Week 03: Introduction to numerical methods (roots of nonlinear algebraic equations, regression, interpolation etc.)
Week 04: Introduction to numerical methods (numerical integration/differentiation, solution of ordinary and partial differential equations)
Week 05: Macroscopic approaches to mass, momentum and energy balances
Week 06: Microscopic approach to mass balance
Week 07: Microscopic approach to momentum balance
Week 08: Microscopic approach to energy balance