

Semester	AUG 2022
Open to semester	7,13,21
Course code	<b>PH4173/PH6513</b>
Course title	<b>Fluid Dynamics</b>
Credits	3 /3
Course Coordinator & participating faculty (if any)	Prasad Subramanian
Nature of Course	Lectures
Pre-requisites	A first course in classical mechanics, basic mathematical methods for physics
Objectives (goals, type of students for whom useful, outcome etc)	This course will be useful for students wishing to gain an overview of the vast field of fluid dynamics. The course is aimed at imparting basic knowledge that will be useful in areas like plasma physics, astrophysics, soft matter, biophysics, and computational fluid dynamics.
Course contents (details of topics /sections with no. of lectures for each)	<p>The first part of the course will be taught by Dr Apratim Chatterji and the second part by Dr Prasad Subramanian</p> <p>Fluid dynamics: scope and applicability, relevant dimensionless numbers, fluid kinematics, mathematical preliminaries, mass, momentum and energy conservation equations, incompressible flows, low Reynolds number flows, compressible flows, shocks.</p> <p>Applications to Astrophysics, and possibly some engineering applications. An introduction to turbulence in fluids.</p>
Evaluation /assessment	<p>End-Sem Examination-40%</p> <p>Mid-Sem Examination-30%</p> <p>Others-2 quizzes 15% each%</p>
Suggested readings (with full list of authors, publisher, year, edn etc.)	<p>1 Fluid Mechanics, P. K. Kundu, I. R. Cohen and D. R. Dowling, Elsevier, 5th edition</p> <p>2 Physical Hydrodynamics, Guyon, Hulin, Petit and Mitescu, Oxford University Press</p> <p>3 The physics of fluids and plasmas: an introduction for astrophysicists, Arnab Rai Choudhuri, Cambridge University Press</p>