



# FLUID MACHINES

**PROF. SUMAN CHAKRABORTY**

Dept. of Mechanical Engineering  
IIT Kharagpur

**TYPE OF COURSE** : Rerun | Core | UG

**COURSE DURATION** : 8 weeks (23 Aug'21 - 15 Oct'21)

**EXAM DATE** : 23 Oct 2021

**PRE-REQUISITES** : Basic knowledge of Fluid Mechanics

**INDUSTRY SUPPORT** : G.E., I.O.C.L, G.A.I.L., O.N.G.C, Shell

**INTENDED AUDIENCE** : Any interested Learners

## COURSE OUTLINE

This is an introductory course in Fluid Machines. The subject Fluid Machines has a wide scope and is of prime importance in almost all fields of engineering. The course emphasizes the basic underlying fluid mechanical principles governing energy transfer in a fluid machine and also description of the different kinds of hydraulic and air machines along with their performances. There is a well balanced coverage of physical concepts, mathematical operations along with examples and exercise problems of practical importance. After completion of the course, the students will have a strong foundation on Fluid Machines and will be able to apply the basic principles, the laws, and the pertinent equations to engineering design of the machines for required applications.

## ABOUT INSTRUCTOR

Dr. Suman Chakraborty is currently a Prof essor in the MechanicalEngineering Department as well as an Institute Chair Professor of theIndian Institute of Technology Kharagpur, India, and the Head of th eSchool of Medical Science and Technology. He is also the AssociateDean for Sponsored Research and Industrial Consultancy. His cu rrentareas of research include microflu idics, nanofluidics, micro-nano scaletransport, with particular focus o n biomedical applications. He has beenawarded the Santi Swaroop Bhatnagar Prize in the year 2013, which isthe highest Scientific Award from the Government of India. He has beenelected as a Fellow of the American Physical Society, Fellow of the RoyalSociety of Chemistry, Fellow of ASME, Fellow of all the Indian NationalAcademies of Science and Engineering, recipient of the Indo-USResearch Fellowship, Scopus Young S cientist Award for high citation ofhis research in scientific/ technical Journals, and Young Scientist/ YoungEngineer Awards from various National Academies of Science and Engineering

## COURSE PLAN

**Week 1** : Introduction and basic principles

**Week 2** : Hydraulic Impulse Turbine

**Week 3** : Hydraulic Reaction Turbine Part I

**Week 4** : Hydraulic Reaction Turbine Part II and Hydraulic Pump Part I

**Week 5** : Hydraulic Pump Part II

**Week 6** : Hydraulic Pump Part III

**Week 7** : Air Compressor Part I

**Week 8** : Air Compressor Part II