

## Syllabus for B.Tech – Energy Engineering

**Course Number & Title:** Fluid Mechanics and Fluid Machines

<b>Course Number &amp; Title:</b> EN203 – Fluid Mechanics and Fluid Machines	
<b>L-T-P-C:</b> 3-0-0-6	
<b>Offered in (Odd/ Even / Any):</b> Semester III	
<b>Pre-Requisite:</b> Nil	
Preamble / Objectives (Optional): To understand the basic properties of the fluid, fluid statics, kinematics, and fluid dynamics so as to analyze and appreciate the complexities involved in solving the fluid flow problems related to energy. To develop the skill for applying the fluid statics, kinematics and dynamics of fluid flow concepts for solving mechanical engineering problems with emphasis on energy.	
Course Content/ Syllabus: Basic concepts and definitions of fluid statics and kinematics, equations of conservation of mass, momentum and energy for systems and control volumes, Bernoulli equation and its applications, Navier - Stokes equations and its applications, stream function and flow potential, dimensional analysis and similarity, internal and external flow; compressible flow; Open channel flow; boundary layer theory concepts; pumps, compressors, hydraulic turbines: classification, heads and efficiencies, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies.	
Books (In case UG compulsory courses, please give it as “Text books” and “Reference books”. Otherwise give it as “References”.	
Text Books: (Format: Authors, <i>Book Title in Italics font</i> , Volume/Series, Edition Number, Publisher, Year.)	
1.	Y A Cengel and J M Cimbala. <i>Fluid Mechanics: Fundamentals and Applications</i> , 4 <sup>th</sup> Edition, McGraw-Hill Education, 2019.
2.	S K Som, G Biswas and S Charkaborty. <i>Introduction to Fluid Mechanics and Fluid Machines</i> , 3 <sup>rd</sup> Edition, McGraw-Hill Education, 2017.
Reference Books: (Format: Authors, <i>Book Title in Italics font</i> , Volume/Series, Edition Number, Publisher, Year.)	
1.	R W Fox, A T McDonald and J W Mitchell. <i>Introduction to Fluid Mechanics</i> , 10 <sup>th</sup> Edition, Wiley, 2020.
2.	F M White and H Xue, <i>Fluid Mechanics</i> , 9 <sup>th</sup> Edition, Wiley, 2022.
3.	B R Munson and D F Young, <i>Fundamentals of fluid mechanics</i> , 8 <sup>th</sup> Edition, 2018.