BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus

INSTRUCTION DIVISION
FIRST SEMESTER 2016-17
Course Handout (Part II)

Date: 02/08/2016

In addition to Part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No.	**: ME F212 / MF F212**
Course Name	**: Fluid Mechanics**
Instructor-in-charge	**: Jitendra S Rathore**
Tutorial Instructor	**:** Ravi Inder Singh, Shyam Sundar Yadav, J S Rathore, M S Soni

1. **Course Description:**

   Fluid statics, Pressure on submerged surfaces, Reynolds Transport Theorem, Integral relations for control volume, Mass, Momentum and Energy Conservation, Bernoulli's Equation, Differential relations for fluid flow, Navier-Stokes Equation, Viscous flow, Dimensional analysis and similarity, Internal flow, External flow, Potential flow.

2. **Scope and Objective:**

   The course will introduce fluid mechanics and establish its relevance in mechanical engineering. Basic fundamentals of momentum transport are studied and demonstrate how these are used for the design of simple hydraulic components.

3. **Text books:**

   Frank M White, Fluid Mechanics, 7th Edition, Tata McGraw Hill

   Reference Books:

   1. Robert W. Fox & Alan T. McDonald; Introduction to Fluid Mechanics; John Wiley Publications; 1994; 4th Edition.
   2. James. A. Fay, Introduction to Fluid Mechanics, Prentice Hall of India (2007).
   3. James R. Welty; Charles E. Wicks and Robert E. Wilson, Fundamentals of Momentum, Heat and Mass transfer; John Wiley Publications, 4th Edition.

4. Course Plan:

Learning Objectives	No of Lecture Hour	Reference Chap./Sec.# (Book)
Fluid Statics: Introduction, Pressure on submerged surfaces, Rigid body motion	6	Chapter 1 & 2
Fluid in Motion: Lagrangian and Eulerien representation, Reynolds Transport Theorem	1	Class notes
Integral Relations for a Control Volume: Conservation of Mass, Momentum and Energy, Bernoulli's equation	6	Chapter 3
Differential Relations for Fluid Flow: Newtonian Fluid, Newton's viscosity relation, Non-Newtonian fluids, Navier-Stokes Equation, Viscous Flow	7	Chapter 4
Dimensional Analysis and Similarity	4	Chapter 5
Internal Flow: Fully Developed Laminar Flow, Viscous Flow in Ducts	6	Chapter 6
External Flow: Flow past Immersed Bodies, Inviscid Flow	6	Chapter 7
Potential Flow, Low Reynolds Number Flows	4	Chapter 8, Class notes

6. Evaluation Scheme:

EC No.	Evaluation Component	Duration	Weightage	Date, Time & Venue	Nature of Component
1.	Mid sem. Exam.	1.5 Hrs	30%	**4/10 2:00 - 3:30 PM**	CB
2	Tutorial	---	20%	Thursday (8 to 9 am)	CB/OB
3.	Quiz	---	10%	----	CB
4.	Compre. Exam.	3 Hrs	40%	**5/12 FN**	CB+OB

7. **Tutorial :** Will be announced in the class. There will be total 6 evaluative tutorials. Three will be conducted before midsem exam (out of which best 2 will be considered) and 3 will be conducted after midsem (again best 2 will be considered). **There will be no makeup in any circumstances for evaluative tutorials.**
8. There will be one quiz exam in the last week of November after the completion of course. **No makeup in any circumstances for Quiz exam.**
9. **Chamber Consultation Hour:** Will be announced by instructors individually in the class.
10. **Make up Policy:** Make-up will be granted only to genuine cases. For cases related to illness, proper documentary evidence is essential. Prior permission is necessary if student is out of station on the test date. **No make-up for tutorial tests and quiz component.**
11. **Notices:** Notice, if any, concerning the course will be displayed on the Notice Board of Mechanical Engineering Department as well on Nalanda.

Instructor In-charge
ME F 212/ MF F 212