

Fall 2020

ME 405-101: Mechanical Laboratory II

Sahidur Rahman

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Department of Mechanical and Industrial Engineering
ME 405-101 -- MECHANICAL LAB II
Fall 2020

Instructor: Dr. S. Rahman

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Office: GITC 2105

Catalog Description: ME 405 (1-2-2)

Laboratory emphasizes the use of fundamental principles and instrumentation systems for the analysis and evaluation of mechanical components within a system.

Prerequisites: ME 343 – Mechanical Laboratory – I
ME 312 – Thermodynamics II

Co-requisite: ME 407 – Heat Transfer

Course Objectives:

1. To develop the skills in acquiring and processing experimental data
2. To develop skills in analyzing experimental errors and assessing the accuracy of the engineering measurements
3. To develop the skills in applying the principles of potential flows for describing and designing mechanical components, including pumps and turbines
4. To develop skills in describing transient temperature measurements using analytical and numerical approaches
5. To develop skills in analyzing pressure measurements and use such measurements to reconstruct the flow velocity profiles
6. To develop skills in preparing written technical reports
7. To develop skills in working on an engineering project as a group

Lab Experiments:

- (1) Drag and pressure distribution on a cylinder
- (2) Performance test of a Centrifugal Pump
- (3) Performance test of a Gear Pump
- (4) Performance test of an Impulse Turbine (Pelton Wheel)
- (5) Transient heat conduction in bodies of finite length

GRADING POLICY	Lab reports & class participation	40 %
	Midterm Tests (2x15%)	30 %
	Final Exam	30 %

Course Outcomes:**Objective 1**

Students will develop an ability to process experimental data using theoretical concepts of fluid mechanics, heat transfer, and thermodynamics

Objective 2

Students will develop an ability to quantify and analyze experimental errors, separate between systematic and statistical errors, and determine the reliability of measurements

Objective 3

Students will learn using generic data processing software to process experimental data and describe the measurements using engineering models

Objective 4

Students will learn how to characterize and test mechanical components including pumps and turbines

Objective 5

Students will demonstrate an ability to prepare comprehensive written technical reports

CLASS HOURS (VIRTUAL & ONE FACE-TO-FACE SESSION)

Monday 6:00 PM – 8:50 PM ME 110

OFFICE HOURS (VIRTUAL OR FACE-TO-FACE)

Monday 03:30 PM – 05:30 PM
Tuesday 10:00 AM – 02:30 PM (by appointment only)
Wednesday
Thursday 10:00 AM – 02:30 PM (by appointment only)
Friday 01:50 PM – 05:30 PM

SYNCHRONOUS ONLINE* INFORMATION

The instructor will discuss these requirements on the first day of the course and/or post on their Learning Management System (LMS).

- The course will meet in the Synchronous Online format.
- The instructor will invite students for face-to-face labs.

Please become familiar

- Webex: <http://ist.njit.edu/webex>
- Online Proctoring: <https://ist.njit.edu/online-proctoring/>