

MEC 316: Mechanical Engineering Laboratory I

Fall 2018

Prerequisites for the course: MEC major; C or better in MEC 363; PHY 134;

Corequisites for the course: MEC 214; MEC 220 or ESE 271; MEC 301 and MEC 364; AMS 361 or MAT 303

Instructors: Profs. David Hwang (in charge), and Fu-Pen Chiang

General course related questions to be addressed to Prof. David Hwang by
(email) david.hwang@stonybrook.edu

Office hours of Instructors:

Thermo-Fluid Part (Lab 1-5): Prof. Hwang (222 Heavy Engineering), Mon., 1:00 - 4:00 pm

Solid Part (Lab 6-10): Prof. Chiang (105 Light Engineering), Fri., 1:00- 4:00 pm

Teaching Assistants: Seungkuk Kuk (Fluid Labs 1-5), Zi-An Jia (Solid Labs 6-10)

How to ask lab related questions:

Thermo-Fluid Part Questions (Lab 1-5)

- Ask Prof. Hwang (Instructor) during office hours (preferred) or send an email if necessary (david.hwang@stonybrook.edu)
- Ask Seungkuk Kuk (TA) during lab or send an email if necessary (seungkuk.kuk@stonybrook.edu)

Solid Part Questions (Lab 6-10)

- Ask Prof. Chiang (Instructor) during office hours (preferred) or send an email if necessary (fu-pen.chiang@stonybrook.edu)
- Ask Zi-An Jia (TA) during lab or send an email if necessary (zi-an.jia@stonybrook.edu)

Course Objectives and Outcomes:

Students are introduced to a variety of sensors and instruments commonly used in mechanical engineering practice. The lectures provide background on the general principles of measurement systems and their performance characteristics. Measurements of different physical quantities will also be discussed in the class. The laboratory experiments provide hands-on experience in the use of several sensors and instruments that form the basis for the laboratory courses MEC 317 and MEC 417 where the use of these instruments is needed for more advanced experiments. Students are required to learn the basics of probability and statistics as well. Students shall:

1. Learn to apply mathematics, physics, chemistry, and engineering principles to measurement problems in mechanical engineering;
2. Conduct experiments and interpret data;
3. Learn modern measurement techniques as applied to thermal and mechanical systems;
4. Identify, formulate, and solve engineering problems;
5. Learn to communicate effectively;

Reference book:

Hardcopy of Lab Manual will be distributed, and necessary materials will be uploaded on Blackboard.

Lab fee:

Each student pays course fee of \$100.

Time and Place: Lectures: 12:00 – 12:53 pm Mon, Room 143 Engineering, 1st-5th week.
Labs: 2:30 – 4:30 pm Tu. & Th., 206 Heavy Engineering

(See detailed schedule on next page for complete information)

List of 10 labs:

1. **Lab 1:** Temperature measurement
2. **Lab 2:** Pressure and velocity measurement
3. **Lab 3:** Mass-flow measurement
4. **Lab 4:** Temperature measurement from hot surfaces
5. **Lab 5:** Labview based liquid flow control
6. **Lab 6:** Natural vibration modes of a cantilever beam
7. **Lab 7:** Straightness measurement of linear motion
8. **Lab 8:** Strain Measurements
9. **Lab 9:** Calibration of a linear variable differential transformer
10. **Lab 10:** Labview based DC voltage and AC signal measurements

Grading Policy: To pass this course, all 10 labs must be completed, and lab report should be submitted till next lab session; typically in one week (Each Laboratories & Reports takes 10%): 100% in total for 10 lab reports

Disability Support Services (DSS) Statement:

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>.

Academic Integrity Statement:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>.

Critical Incident Management:

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

Detailed Schedule for MEC316 - Fall 2018

	Monday (Lecture) 12:00-12:53 pm 143 Engineering	Tuesday (Lab) 2:30 – 4:30 pm 206 Heavy Engineering	Thursday (Lab) 2:30 – 4:30 pm 206 Heavy Engineering
Week 1 (08/27-09/02)	27-August Intro, Group, Project, Safety (Hwang)	28-August Lab 1-10 Overview : Group 1-20 (Hwang, Chiang)	30-August Lab 1-10 Overview : Group 21-40 (Hwang, Chiang)
Week 2 (09/03-09/09)	3-September Holiday (Labor Day)	4-September LabView 1 : Group 1-20 (Hwang)	6-September LabView 1 : Group 21-40 (Hwang)
Week 3 (09/10-09/16)	10-September Report Writing (Cubaud)	11-September LabView 2 : Group 1-20 (Hwang)	13-September LabView 2 : Group 21-40 (Hwang)
Week 4 (09/17-09/23)	17-September Error Analysis (Hwang)	18-September Lab 1-10 : Group 1-20 (Hwang, Chiang)	20-September Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 5 (09/24-09/30)	24-September Complimentary if necessary (TBA)	25-September Lab 1-10 : Group 1-20 (Hwang, Chiang)	27-September Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 6 (10/01-10/07)	1- October No Lecture	2-October Lab 1-10 : Group 1-20 (Hwang, Chiang)	4-October Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 7 (10/08-10/14)	8-October No Lecture (Fall Break)	9-October No Lab (Fall Break)	11-October Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 8 (10/15-10/21)	15-October No Lecture	16-October Lab 1-10 : Group 1-20 (Hwang, Chiang)	18-October Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 9 (10/22-10/28)	22-October No Lecture	23-October Lab 1-10 : Group 1-20 (Hwang, Chiang)	25-October Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 10 (10/29-11/04)	29-October No Lecture	30-October Lab 1-10 : Group 1-20 (Hwang, Chiang)	1-November Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 11 (11/05-11/11)	5-November No Lecture	6-November Lab 1-10 : Group 1-20 (Hwang, Chiang)	8-November Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 12 (11/12-11/18)	12-November No Lecture	13-November Lab 1-10 : Group 1-20 (Hwang, Chiang)	15-November Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 13 (11/19-11/25)	19-November No Lecture	20-November Lab 1-10 : Group 1-20 (Hwang, Chiang)	22-November Holiday (Thanksgiving)
Week 14 (11/26-12/02)	26-November No Lecture	27-November Lab 1-10 : Group 1-20 (Hwang, Chiang)	29-November Lab 1-10 : Group 21-40 (Hwang, Chiang)
Week 15 (12/03-12/09)	3-December No Lecture	4-December Lab – Complementary sessions (if necessary)	6-December Lab – Complementary sessions (if necessary)

