

MEC 316: Mechanical Engineering Laboratory I

Fall 2016

Instructors: Profs. David Hwang (in charge), and Ta-Yung Hsu

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

Office hours:

Thermo-Fluid Part (Lab 1-3 & 7-8): Prof. Hwang (222 Heavy Engineering), Mon., 1:00 - 4:00 pm

Solid Part (Lab 4-6, 9-10): Prof. Hsu (129 Light Engineering), Mon., 1:00-4:00 pm

Laboratory Manager: Ta-Yung Hsu

Teaching Assistants: Zhen Wang (Lab 1-3 & 7-8), and Xiao Wang (Lab 4-6, 9-10)

Course Objectives:

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. Design and 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 145 Engineering
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:** Natural vibration modes of a cantilever beam
5. **Lab 5:** Straightness measurement of linear motion
6. **Lab 6:** Strain Measurements
7. **Lab 7:** Temperature measurement from hot surfaces
8. **Lab 8:** Labview based liquid flow control

- 9. Lab 9:** Calibration of a linear variable differential transformer
- 10. Lab 10:** Labview based DC voltage and AC signal measurements

Instrumentation Project: Scale device design as final project

Grading Policy: To pass this course

- All 10 labs must be completed and lab report should be submitted in one week after each lab session (Each Laboratories & Reports 8%): 80%
- Instrumentation project must be completed (Final report): 20%

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 2015

	Monday (Lecture) 12:00-12:53 pm 145 Engineering	Tuesday (Lab) 2:30 – 4:30 pm 206 Heavy Engineering	Thursday (Lab) 2:30 – 4:30 pm 206 Heavy Engineering
Week 1 (08/29-09/04)	29-August Intro, Group, Project, Safety (Hwang)	30-August Lab 1-10 Overview (Hwang, Hsu)	1-September Lab 1-10 Overview (Hwang, Hsu)
Week 2 (09/05-09/11)	5-September Holiday (Labor Day)	6-September No Class (University Calendar)	8-September
Week 3 (09/12-09/18)	12-September Instrumentation Design Project (Hsu)	13-September LabView 1 : Group 1-20 (Hwang, Hsu)	15-September LabView 1 : Group 21-40 (Hwang, Hsu)
Week 4 (09/19-09/25)	19-September Error Analysis (Hwang)	20-September LabView 2 : Group 1-20 (Hwang, Hsu)	22-September LabView 2 : Group 21-40 (Hwang, Hsu)
Week 5 (09/26-10/02)	26-September Lab 1-10 Overview Complimentary (TBA)	27-September Lab 1-10 Group 1-20 (Hwang, Hsu)	29-September Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 6 (10/03-10/09)	3- October	4-October Lab 1-10 Group 1-20 (Hwang, Hsu)	6-October Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 7 (10/10-10/16)	10-October	11-October Lab 1-10 Group 1-20 (Hwang, Hsu)	13-October Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 8 (10/17-10/23)	17-October	18-October Lab 1-10 Group 1-20 (Hwang, Hsu)	20-October Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 9 (10/24-10/30)	24-October	25-October Lab 1-10 Group 1-20 (Hwang, Hsu)	27-October Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 10 (10/31-11/06)	31-October	1-November Lab 1-10 Group 1-20 (Hwang, Hsu)	3-November Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 11 (11/07-11/13)	7-November	8-November Lab 1-10 Group 1-20 (Hwang, Hsu)	10-November Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 12 (11/14-11/20)	14-November	15-November Lab 1-10 Group 1-20 (Hwang, Hsu)	17-November Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 13 (11/21-11/27)	21-November	22-November Lab – Complementary sessions (if necessary)	24-November Holiday (Thanksgiving)
Week 14 (11/28-12/04)	28-November	29-November Lab 1-10 Group 1-20 (Hwang, Hsu)	1-December Lab 1-10 Group 21-40 (Hwang, Hsu)
Week 15 (12/05-12/11)	5-December	6-December Lab 1-10 Group 1-20 (Hwang, Hsu)	8-December Lab 1-10 Group 21-40 (Hwang, Hsu)

