

# AME341bL: Mechoptronics Laboratory II

v7 1/19/2022

**Textbooks:**

- (optional) *Introduction to Mechatronics and Measurement Systems*, Alciatore & Histan (2011) McGraw-Hill
- (optional) *Theory and Design for Mechanical Measurements*, Figliola & Beasley (2010) Wiley
- (optional) *The Art of Electronics*, Horowitz & Hill (1989) Cambridge University Press

**Lecture:** MWF 8-8:50 SGM 124 or SGM 101

**Lab:** M, T, W or Th 2-4:50 **BHE 301**

**Instructors:**

- Dr. M. Gilpin OHE 500H gilpin@usc.edu
- Dr. A. Potnuru OHE 500G potnuru@usc.edu

Week	Date	Lecture	Lab	Assn. Duc	%
1	M 1/10	(1) Introduction (Zoom Only)	<b>No Lab</b> <i>Remote Start</i>		
	W 1/12	(2) 2 <sup>nd</sup> Order Systems I (Zoom Only)			
	F 1/14	(3) Strain Gauges (Zoom Only)			
2	M 1/17	<b>MLK Day</b>	<b>No Lab</b>	<b>A9</b> <i>LabView @ Home</i>	4
	W 1/19	(4) Wheatstone Bridge (Zoom Only)			
	F 1/21	(5) 2 <sup>nd</sup> Order Systems II (Zoom Only)			
3	M 1/24	(6) LabView I - Vibrating Beam Prep (Zoom Only)	<b>E10:</b> Strain gauges/Vibrating Beams <i>(Online)</i>		
	W 1/26	(7) LabView II - A9 Recap, Sampling (Zoom Only)			
	F 1/28	(8) LabView III - Global Variables, Feedback (Z.O.)			
4	M 1/31	(9) Turbulence, Jets and Plumes	<b>E11:</b> LabView I - Motor Control		
	W 2/2	(10) LabView III - Safety			
5	M 2/7	(11) Dynamic Pressure & Measurement	<b>E12:</b> LabView II - Automation	<b>A10</b> <i>Report</i>	10
	W 2/9	No Lecture!			
	F 2/11	(12) A10 Recap / Minitalks?			
6	M 2/14	(13) Thermocouples	<b>E13:</b> Turbulent Jets	<b>A12</b> <i>LabView</i>	2
	W 2/16	(14) Arduino I			
	F 2/18	(15) Arduino II			
7	M 2/21	<b>President's Day</b>	<b>No Lab...</b> but MiniTalks	<b>A13</b> <i>MiniTalk</i>	10
	W 2/23	(16) Convective Heat Transfer I			
	F 2/25	(17) Convective Heat Transfer II			
8	M 2/28	(18) A13 Recap	<b>E14:</b> Themocouples	<b>A13.5</b> <i>Arduino @ Home</i>	4
	W 3/2	(19) SE & Junior Project Proposal Info			
	F 3/4	(20) Optics I - Light and Lenses			
9	M 3/7	(21) Optics II - Digitization and Correlation	<b>SE1:</b> Digital Image Correlation	<b>A14</b> <i>Spreadsheet</i>	10
	W 3/9	(22) Wind Tunnel I - Engineering Aerodynamics			
10	M 3/14	<b>SPRING BREAK</b>	<b>No Lab</b>		
	F 3/18				
11	M 3/21	(23) Wind Tunnel II - Lift and Drag of Airfoils	<b>SE1:</b> Digital Image Correlation <b>SE2:</b> Wind Tunnel		
	W 3/23	(24) SMA I			
	F 3/25	(25) SMA II			
12	M 3/28	(26) SMA III	<b>SE2:</b> Wind Tunnel <b>SE3:</b> SMAs	<b>JP-P Proposal</b> <b>SE1 Report</b>	4 12
	W 3/30	(27) SE Spreadsheet and Presentation Details			
13	M 4/4	(28) Something Fascinating I	<b>SE3:</b> SMAs	<b>SE2 Report</b>	
	W 4/6	(29) Something Fascinating II			
14	M 4/11	(30) No Lecture - Planning for E15 in Lab	<b>No Lab ... but</b> <b>SE:</b> 1-on-1 Spreadsheet Presentations	<b>SE3 Report</b> <b>SE Presentations</b>	12
	W 4/13	(31) AME 441: I			
	F 4/15	(32) JP Presentation Details - How to Present?			
15	M 4/18	(33) AME 441: II	<b>E15:</b> Junior Project		
	W 4/20	(34) AME 441: Top Groups!			
16	M 4/25	(35) Final Exam Review	<b>No Lab ... but</b> Junior Project Presentations	<b>A15 Presentations</b> <b>441-bb Piazza Post</b>	12 2
	W 4/27	(36) Grad School?			
17	M 5/2	<b>Study Days</b>			
18	M 5/9	<b>Final Exam: 11am - 1pm</b>		<b>Final Exam</b>	15

- 3% of the total grade will be determined by a Performance measure compiled by staff over the whole semester. It includes all aspects of engagement in lectures, labs, the discussion board and office hours.
- The last three Special Experiments (SE1, SE2 and SE3) are run for two weeks each. Each student must complete 2 of the 3 Special Experiments.
- A full written report, worth 12% of the course grade, is required for one of the Special Experiments.
- A 1-on-1 presentation/demo of data analysis, worth 12% of the course grade, is required for a second SE. It is given during a 10- minute timeslot on your regular lab day during week 14.