ME 144L: Fall 2014
Dynamic Systems and Controls Lab

Instructor: Raul G. Longoria
Office/Hours: ETC 5.134B; TTH 11a-12 p
Teaching Assistants: See Weekly Schedule and TA information

Course Description:
- This is a senior-level laboratory course that provides practical hands-on training and experience with methods used in modeling, analysis, simulation, and control of engineering systems.
- Emphasis is given to developing and using experimental techniques that support system modeling and control applications.
- The course also aims to provide instruction and experience with measurement and instrumentation concepts, sensor technologies, use of computer-based data acquisition, and design of physical experiments.
- See the course log for course activity/content which begins first week of classes.

Prerequisites:
This course is related to but is independent of the lecture-based course ME 344 (Dynamic Systems and Controls), which is a co-requisite for registration in this laboratory. You should also have credit for ME 340/140L. It is expected that you can apply fundamental circuit concepts to analyze and understand testing with basic electrical instruments.

Textbook:
All materials will be provided on the course website: http://www.me.utexas.edu/~dsclab. Refer to your course textbook(s) from ME 344; your notes/text from 340/140L will also be helpful. Some materials will also be posted on UT Canvas.

Grading:
Pre-Lab Exercises: 30%, Notebook: 10%, Lab Evaluations: 30%, Participation: 10%, Hands-On Quiz: 20%

Course Topics and Application areas (subject to change):
The major topics and corresponding labs for this course are listed in the table below, although topics and labs may change. Pre-laboratory assignments and laboratory descriptions can be found on the course log.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Applied to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic systems modeling and simulation</td>
<td>Compound pendulum; Two-can lab; Beams; Electromechanics</td>
</tr>
<tr>
<td>Sensors, instrumentation, data acquisition</td>
<td>Rotational motion, pressure, strain/force, acceleration</td>
</tr>
<tr>
<td>Force and moton measurement</td>
<td>Beam response, shaker table response</td>
</tr>
<tr>
<td>Image acquisition and analysis</td>
<td>Analog meter motion detection and control</td>
</tr>
<tr>
<td>Electromechanical transduction</td>
<td>LVDT sensors, EM shaker, analog meter</td>
</tr>
<tr>
<td>Feedback control principles</td>
<td>Analog meter needle position control lab</td>
</tr>
</tbody>
</table>

Last updated August 23, 2014 | See Page 2 of Overview | Course Syllabus (PDF file)
Grading Policy:

- **Pre-Laboratory Preparation.** This grade will be based on weekly assigned pre-labs, which will consist of readings and problems meant to prepare you for the week's lab and to reinforce topics covered in lecture. These assignments may be discussed in lecture and are due at the beginning of lab each week; they may be handwritten or typed.

- **Notebook.** You are required to keep notebook to record your lab work. This must be a bound notebook with hard cover (no loose-leaf). Example. The notebook is the only material you will be allowed to use in the final (individual) hands-on exam. **Do not** complete pre-lab or LE assignments in your notebook. The notebook will only be graded at the end of the semester.

- **Participation.** The TA will grade your laboratory participation, and the instructor may grade lecture participation (through some pre-lab assignments). The TA's grade will be based on observation of your individual contributions to the week's in-lab study. Attendance at all labs is required.

- **Laboratory Evaluations (LE).** The lab evaluations (LEs) are reports that will address specific questions or problems investigated during the laboratory. The LE format must be followed. Due dates will be specified weekly. Clear and concise writing, drawings/schematics, and graphs are expected.

- **Hands-on quiz:** an exam will be given during lab in the last week of classes. Every student must work individually. Time slots will be assigned by the TAs.

Course Outcomes:

This course addresses the following program outcomes of the ABET Engineering Curriculum 2000: 4, 5, 6, 7. In particular, attention by the student should be given to Outcome 4, "Ability to set up and conduct experiments, and to present the results in a professional manner."

Additional Information:

- Make sure that the TA has recorded your e-mail address by the end of the first lab meeting.
- It is expected that you will fully utilize libraries, computer facilities, and online resources as needed.
- Attendance at all labs is required, and lecture attendance is highly recommended. If you need to miss a lab session, it is your responsibility to contact the TA and your lab partner/team PRIOR to the lab session you expect to miss. Make-up work will be at the discretion of your lab TA.
- Problems with team members should be referred to the course instructor as early as possible.
- Lab switching will not be permitted without the written approval of the instructor.
- All incidents of academic dishonesty will be treated in strict accordance with University policy.
- Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259, http://www.utexas.edu/diversity/ddce/ssd/