

**Engineering Mechanics 316 Laboratory  
109 Earth-Engineering Sciences Building**

**Semester Fall**

**Year 2009**

Instructor: L.Ventsel

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**General Information:**

The objective of the course is to introduce students to the relevant technology and methods used to determine the mechanical responses of engineering materials and structural components; in addition, students will be tutored in the competent reportage of short technical investigations. The laboratory assignments are designed to complement the lecture course E Mch 315, which must be taken as a prerequisite or concurrently. Students must supply the following course materials for EMch 316:

- *Experiments in the Determination of Mechanical Behavior of Engineering Materials*, (hereafter referred to as the "Lab Manual") Richard A. Queeney, 6<sup>th</sup> or 7<sup>th</sup> Edition, Kendall-Hunt Publishers, Dubuque, Iowa.
- Pad of quadrille paper for prelab assignments (see note on page *viii* of the above lab manual).
- **Safety glasses (available at Penn State Bookstore, and elsewhere)**

**Laboratory Reports:**

- A. The laboratory reports are to be written in accordance with the instructions given in the laboratory manual. ***Note: if you are unable to immediately purchase a lab book (out of stock etc.), contact your TA at the start of the lab and they can make a copy of the required pages for you.***
- B. Reports should be written in a neat and professional manner, with errors neatly lined out but not erased. The format should be identical to the sample lab report in the laboratory manual (Lab 0). All section headings, figures, table, and calculations should be labeled. Make sure the appropriate units are included for all final answers, and that you write your name, date, course name and section, and page number at the top of each page of the report.
- C. Use the forms provided in the laboratory manual for your lab reports. If you must add further sheets for any reason, use the quadrille-ruled paper.
- D. Use **SI** units for all final answers: relevant conversions factors are listed on page *vi* of the manual. If experimental measurements were made in U.S. Customary units, both the U.S. Customary (so-called "English") and the converted SI answer should be given.

- E. In addition to arriving at the laboratory session with the above-named supplies, make sure that you are also equipped with a ruler and functioning calculator.
- F. Prior to attending each lab session, all students should have read over the appropriate lab manual write up and have completed the corresponding prelab, which are designed to prepare you for the class. The prelab is, in essence, the course homework. Prelab assignments, done on quadrille paper, are to be submitted to the instructor at the beginning of the class: *failure to submit the prelab is equivalent to a zero grade.*

The actual lab report is to be completed and submitted during the lab session: ample time is available to complete the assignment in class, providing the student is familiar with the work prior to arriving and the group organizes swiftly to make measurements, begin the experiment, and execute calculations. Sections 1 and 2 of the report, "Identification" and "Objective", can be completed before arriving in class. However, **arriving with other portions of the report completed, presumably by copying others' work, is considered cheating and will be treated accordingly.**

#### Attendance:

- A. Since the course is a professional interaction between student and instructor, attendance at each laboratory is mandatory, period! Failure to attend a laboratory session will result in a grade of "Zero" for that lab. **Missing two or more labs results in automatic course failure.**
- B. Valid reasons for lab absence, meaning scheduled University activities or incapacitating sickness (doctor's verification needed) are, of course, allowed, **BUT** the student must notify their lab instructor at least one week prior to the to-be-missed sessions for an activity, or ASAP prior to the lab for sickness. At this time, arrangements will be made to attend an alternative session for that lab. **Students must arrange the substitution with both instructors.** Note: the instructor may refuse to take on the substitution of the lab is too full. No attendance credit will be given for switching sections without prior arrangement with the instructors.

Finally, work assignments and travel arrangements are **not** valid reasons for attending alternative lab meetings.

#### Grading:

- A. Laboratory reports count for 7 points each toward the final course score.
- B. Neatness also counts! It is professionally important to effectively convey your findings to others. **If your fellow professional (the instructor) cannot read something, he/she will have no choice but to mark it incorrect.**
- C. **There is a final exam for the course that covers the full range of experiments completed, including relevant calculations such as stress, strain, constitutive relationships, Mohr's Circle, strain rosettes, yield theories etc.** Lab report review will be the most effective means of exam preparation. Hands-on interaction with laboratory

apparatus will not be a feature of the exam, but knowledge of the apparatus sufficient to complete one of the experiments is a valid test subject area.

The final will be administered during the regularly scheduled finals periods as determined by the registrar's office. Any exam conflicts should be handled in the usual fashion by filing notice with that office. **Note: an equation sheet with one-side of an 8.5 x 11 is allowed. In addition, the length of the final exam will be 75 minutes.**

- D. Final grades will be determined from the below scoring scheme, according to University and Departmental policies.

Lab Report (6 x 7 pts)	42%
Class participation (6 x 1pts)*	6%
Prelabs (6 x 4.5 pts)	27%
Comprehensive Final Exam	<u>25%</u>
Total	100%

\*Class participation include:

1. Class attendance
2. Activity
3. Safety requirements
4. Lab preparation
5. Class ethics

All lab sections run 3 hours.

The labs are generally every other week. **No labs the week of Thanksgiving Break (see schedule).**

Note: Lab numbers correspond to the lab numbers indicated in lab books except for **Lab #1 which is an Introduction to the course.**

**Note: Missed sessions (due of course, to professionally acceptable reasons) will be made up on the off weeks, with times to be arranged with your instructors WELL IN ADVANCE!**

**Lab Instructors:**

Liliya Ventsel  
James Moses

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**Faculty Supervisor (PLEASE CONTACT YOUR TA FIRST ABOUT ANY PROBLEMS):**

Dr. A.E. Segall 403B EES 865-7829 [aesegall@psu.edu](mailto:aesegall@psu.edu) (always use Emch 316 in subject line!)

### 316 LAB SCHEDULE Fall 2009

Section	Lab #1	Lab #2	Lab #3	Lab #4	Lab #5	Lab #6	Lab #7	Review
01 T 11:15A - 2:15P	8/25	9/01	9/22	10/06	10/20	11/03	11/17	12/01
02 T 02:30P - 5:30P	<b>8/25</b>	9/08	9/15	9/29	10/13	10/27	<b>11/10</b>	<b>12/01</b>
03 T 6:30P - 9:30P	8/25	9/01	9/22	10/06	10/20	11/03	11/17	12/01
<b>04 W 11:15A - 2:15P</b>	<b>8/26</b>	<b>9/09</b>	<b>9/23</b>	<b>10/07</b>	<b>10/21</b>	<b>11/04</b>	<b>11/18</b>	<b>12/02</b>
05 W 02:30P - 05:30P	8/26	9/09	9/23	09/30	10/14	10/28	11/11	12/02
<b>06 W 06:30P - 09:30P</b>	<b>8/26</b>	<b>9/09</b>	<b>9/23</b>	<b>10/07</b>	<b>10/21</b>	<b>11/04</b>	<b>11/18</b>	<b>12/02</b>
07 R 2:30P - 05:30P	8/27	9/10	9/24	10/01	10/15	10/29	11/12	12/03
08 R 11:15A - 02:15P	<b>8/27</b>	9/10	9/17	10/08	10/22	11/05	11/12	12/03
<b>09 R 06:30P - 09:30P</b>	<b>8/27</b>	<b>9/10</b>	<b>9/24</b>	<b>10/08</b>	<b>10/22</b>	<b>11/05</b>	<b>11/19</b>	<b>12/03</b>