### TENTATIVE SCHEDULE

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<th>Topic</th>
<th>Suggested Problems*</th>
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<td>Ch.1: 1, 3, 4, 7, 9</td>
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<td>HOLIDAY</td>
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<td>4/5</td>
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<td>Topic 2: Intro. to statistics and sampling; Measures of central tendency and dispersion</td>
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<td>Topic 2: Graphical representation of a finite sample</td>
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<td>Topic 3: Statistics of Infinite Populations: Gaussian Distribution</td>
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<td>Statistics of Infinite Populations: Confidence Intervals</td>
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<td>Topic 7: Regression Analysis, Part I (cont’d)</td>
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<td>Topic 8: Regression Analysis, Part II</td>
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**Final Exam:** Time and location to be announced

*New problems (“-A” problems as well as conceptual/true-false problems) are posted on my web site.

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Text: ME 236 Course Pack, G. Thorncroft, El Corral Publications

Grading: Approximate scale: Exams 20% each, Laboratory 30%, Final 30%  
You must pass both the lecture and lab to pass this course.  
You must pass the cumulative final exam in order to pass the course.

The above schedule is subject to change. Attendance is required, and you are responsible for any announcements made in the class or by Cal Poly e-mail.

**Homework:**

Homework assignments in the lecture are not due, but are required. You cannot perform well in this course without doing the homework – it is the most important factor in your success in this course.

Homework solutions will be posted outside my office. I will post solutions to every problem in the text, not just the recommended problems, so you have practice problems to prepare for exams. Solutions to the extra problems will not be posted; come see me during office hours if you have questions on any problem, assignment, or experiment.
Professionalism:

This course is meant to prepare you for professional practice. Therefore I expect your assignments to be of the highest professional quality – work that is worthy of the workplace that you are preparing to enter. I will also enforce professional standards in the operation of lectures and laboratories. I expect you to be prepared for class and lab, ready to participate in discussions, and giving the instructor and your colleagues your full attention. Hint: Put away your cell phones and newspapers!

Academic Integrity:

I will not condone academic dishonesty, cheating, or plagiarism in any form. If caught, you will be dismissed from the course immediately, receive a grade of F, and be reported to the Office of Student Rights and Responsibilities. Please review Cal Poly’s Policy (C.A.M. 684), and the Code of Student Conduct, Rights and Responsibilities: http://www.academicprograms.calpoly.edu/academicpolicies/Cheating.htm and http://osrr.calpoly.edu/index.html

Collaboration:

My approach to teaching this course requires students to work independently on assignments. Unless otherwise explicitly stated by me, collaboration on any assignments is prohibited. Failure to abide by this policy constitutes academic dishonesty, and will result in the disciplinary action described above.

Important Message to Students Regarding Furloughs:

As you are aware, the budget crisis in the state of California has led to unprecedented budget cuts to the CSU system. To try to close the budget shortfall, your fees have increased 32% this year, and the faculty and staff have voted to accept furloughs.

A furlough is mandatory un-paid time off; faculty and staff on each CSU campus are being “furloughed” two days per month (with a 10% pay cut). It is important to recognize that these days off are not holidays. Instead, they are concrete examples of how massive state budget cuts have consequences for you as students and for us as faculty members.

Furloughs will affect how we do business. In some cases, class or laboratory periods could be cut. Entire courses could be canceled. Faculty may offer fewer office hours or other reduced availability, since their work now must be accomplished over fewer working days. Homework may not be graded. Other services may be cut.

In spite of these difficulties, we cannot and will not lower our expectations for the amount of material covered in our courses, or your performance in them. It is our professional obligation to ensure that the required material is covered, and that your performance is evaluated consistently. Cutbacks are not an excuse for lowered expectations.

We faculty and staff are firmly committed to maintaining the quality of your education. So should you. Contact the University administration, the Chancellor’s office, and your state legislator and express how important it is for them to support higher education in California.
ME 236 Outline

Three general outcomes of the course:

1. Ability to take measurements and perform experiments, understand experimental methods and measurement techniques, and obtain knowledge of some measurement technologies.
2. Analyze real data, apply statistical models, and calculate and communicate the uncertainty in measurements, calculations, and plots.
3. Communicate effectively the results of experiments, and present experimental data effectively in graphical and tabular form.

General Outline of Topics

I. Taking Measurements
   • How to take readings from instruments
   • How to measure physical quantities like pressure, temperature, force/weight, length, etc.

II. How accurate is my measurement?
   • Significant figures review
   • Error and uncertainty

III. How does taking repeated measurements help?
   • Sampling
   • Histograms
   • Probability, probability distributions
   • Confidence intervals
   • Using samples to estimate population behavior
   • Using sample statistics to predict the future?
   • Is there “bad” data? What do I do with them?

IV. Performing calculations with real data
   • Example: volume of a cylinder, \( V = \pi D^2 L / 4 \), where \( D \) and \( L \) have uncertainties (±)
   • How do the uncertainties affect the calculated result?
   • How can I improve the calculated result – which measurement should I spend money on to improve?

V. Plotting data – relationships between measurements
   • How do trendlines (curve-fits) work?
   • Is this the “correct” trendline for the data?
   • How accurate is the trendline?
   • What do I do with “bad” data?
Sample Homework

1. General description (or, even better, the entire problem statement – you may scan/copy the original text and figure)

2. Draw picture whenever possible. Draw free-body diagram (or control system/control volume) when necessary. This is not the same as the figure given in the problem statement!

3. List all relevant assumptions. You need not list them at the outset; it makes more sense to write them as you need them in your analysis. Just make them clear!

4. Analysis:
   - Describe analysis steps.
   - Start with the most general equation, and then simplify
   - Solve the algebra BEFORE substituting numbers and units
   - Include all units and unit conversions. NEVER do unit conversions in your head!

5. Include units in answer! Pay attention to significant figures.

6. Consider commenting on the result:
   - Describe the answer in words (e.g., “Thus the object will slide about 5 m down the incline”)
   - Does the number make sense physically?
   - Is the answer consistent with theory?
   - Is the result as expected?
   - What about the sign of the answer?