ME 310, SPRING 2010, Syllabus by week

(note, the lecture material for each week may often (owing to when BU starts semester) straddle a weekend. For example, the lecture "WEEK 1" includes what I would cover on Wednesday the week classes start, and Monday the following week, and the lab week 1 occurs during the first week classes start)

WEEK 1:Class policies and admin;

READING: CH1 Taylor, CH1 Figliola & Beasley
LAB WEEK 1: Exp 1 intro to scope

WEEK 2:Scientific vs Engineering experimentation; Experiment design; precision uncertainty in single measurable; infinite/finite statistics; Bias uncertainty; addition of uncertainty in single measurable

READING: Chapters 4,5,9,10 F&B; Ch 2, 3, 4, 5 Taylor
HW 1 ASSIGNED
LAB WEEK 2: Exp 2 Filters and Op Amp

WEEK 3:uncertainty propagation; significant figures; summarize AM310 rules; F&B method, ISO rules; cyl vol example; chalk data

READING: Chapters 3, 6,7 F&B;
HW 1 due; HW 2 assigned
LAB WEEK 3: Exp 3 Strain Gauges

WEEK 4: static measurement system; example; types of instrument error; Review HW1, HW2,

HW 2 due
LAB WK 4: Exp 4 flow cal Exp 5 marble

WEEK 5: Rev for Exam 1; A/D error; A/D examples (HIFU, Matlab); EXAM 1 (2 hours: :prec/acc;0-ord sys; unc anal; inst error)

LAB WK 5: Exp 4 flow calibration Exp 5 marble density Exp 6 sphere drag

WEEK 6:linear regression; regression examples; weighted fit, power law; TC intro to 1st order systems

READING: CH 3, F&B
HW 3 Assigned
LAB WK 6: Exp 6 sphere drag Exp 7 temperature measurement

WEEK 7:1st Order System; STEP INPUT; SINE INPUT; EXAMPLES; TC DEMO; 2ND ORDER SYSTEMS; STEP INPUT; SINE INPUT;

HW3 DUE; HW4 ASSIGNED
LAB WK 7: Exp 6 sphere drag Exp 7 temperature Exp 4 flow calibration

WEEK 8: RESONANT SYSTEMS; Q; OP DEFS FOR FREQS;MEANS FOR MEASURING F AND DAMPING; REVIEW EXAM 1; DISCUSS PROJECT; Review HW3, 4

HW4 DUE; HW5 ASSIGNED
LAB WK 8: Exp 7 temp Exp 4 flow cal

WEEK 9: Review HW

HW5 DUE; HW 6 handout (self study)
LAB WK 9: PROJECT

WEEK 10: Review for Exam 2; filter demo; Exam 2 (1^{st} and 2^{nd} order Systems, Step (transient) input only)

LAB WK 10: PROJECT

WEEK 11: No lectures, class time for project

LAB WK 11: PROJECT

WEEK 12: Review Exam 2

LAB WK 12: PROJECT

WEEK 13: No class; Design Project Reports and in-class student presentations

LAB WK 13: PROJECT FINAL LAB SESSION!!

WEEK 14: Design Project Reports and Presentations; Review for Final Exam

WEEK 15/16: Final Exam (Comprehensive, Sinusoidal Input ONLY for 1^{st} and 2^{nd} order systems)