

IE 6210 Probability Models & Data Analysis

Fall 2005; 4 credits; T, Th: 7:30-9:50PM

INSTRUCTOR:

GARY S. WASSERMAN, Ph.D., COE, CRE

Office Hr. T,Th: 2:00 - 3:00 PM

(313) 577-3301/ email: gwasserm@wayne.edu

COURSE ORGANIZATION & PREREQUISITE KNOWLEDGE

This course is updated and consistent with the new MS programs structure within the Industrial & Manufacturing Engg. Dept. This course is now organized as a second course in Probability and Statistics. Students are expected to have taken BE 3220 or equivalent.

The M.S. Graduate Programs in the IME Department require a basic prerequisite knowledge of probability and statistics. To ensure that students have the prerequisite knowledge, we are requiring all incoming students to **score at least 75% on each** of two basic entrance exams before the end of the first week of classes.

WEB ACCESS:

- All students must be registered on Blackboard at <http://blackboard.wayne.edu>. Most students are automatically registered, but if you are not, or wish to add another email account, then search for IE 7270 under engineering courses. Select the "enroll" option, and follow directions.
- Handouts, syllabus, answers to homework, and online access to grades are available to each student who has enrolled at Blackboard.com. Additionally, announcements will be posted on Blackboard, and emailed out to the email addresses registered on Blackboard. A discussion board is also available to the students and instructor.

EDUCATIONAL GOALS & OUTCOMES

- To understand how to model experimental data.
- To convey the importance of “statistical thinking” in industry.
- To introduce the use of Analysis of Variance techniques.
- To develop mastery of a statistical computing package such as Minitab®

TEXTBOOK

Montgomery, Douglas and Runger, George C., **Applied Statistics and Probability for Engineers**, John Wiley & Sons, Third Edition, 2003 or 2006 JUST ASK edition.

COMPUTING

Minitab® version 14 will be our preferred statistical computing package for this semester. Minitab is available on campus at several locations including our own pc simulation lab and the main college of engineering building. Student versions can be purchased, as well as downloading a license for personal use of the software during the winter semester. Students may also download a full, trial version of Minitab, which can be used for 30 day period.

GRADING POLICY

Exam 1	100
Exam 2	100
Class Project	50
Homework	50
TOTAL	300

Initially, cutoff scores for the final semester grades of “A”, “B”, etc. will be based upon the use of a traditional scale—*i.e.*, A = 90-100 ; B = 80-89; etc. Adjustments to grade cutoff scores might then be made depending upon the

distribution of the students' final grades and the instructor's overall assessment of student achievement based upon student participation in the class, homework, etc. Such adjustments are made at my discretion, and only when warranted. (*e.g.*, Question 2 on the final contained misleading wording or data which resulted in a disproportionate number of wrong answers, and so no student should have their grade penalized for circumstances beyond their control.)

ABSENCES

It is the student's responsibility to make up for any classes which they may have missed. If you know that you must miss one or more classes, please let you might let me know by email, if possible, so that I may assist you in making sure that handouts, etc., are saved for you. I will not have any provisions available for missed examinations. It will be the student's responsibility to make sure that they are present on the day of examinations. Excused absences on the day of an exam can only be honored if accompanied by a note from a doctor.

HONOR & ETHICS

The code of unspoken ethics in a professional work environment in the US will apply in the classroom. That is, honesty and ethical conduct will not only be expected, but demanded. Please see me if you have any confusion on what I mean. Obviously, cheating on an exam is not permitted. No talking or sharing of even stationary of class handouts is allowed during the exam. Students caught in violation of this policy will end up with failing grades on their exam and/or course. Cooperation in responding to homework questions is not only permitted, but encouraged, as part of the cooperative learning framework of the course. However, copy someone else's homework and handing it in as their own is not permitted.

TOPICS COVERED THIS SEMESTER

- Tests of Hypotheses for a Single Sample.
- Statistical Inference for Two Samples.
- Simple Linear Regression and Correlation.
- Multiple Linear Regression.
- Design and Analysis of Single-Factor Experiments: The Analysis of Variance.
- Design of Experiments with Several Factors.
- Nonparametric Statistics.
- Statistical Quality Control.

SCHEDULE OF TOPICS

DATE	TOPIC	HW
W 9/7	Introduction	
TU 9/13	Ch 9: Single Sample Hypothesis Tests	9-2,4, 20, 24, 32, 44,50
TH 9/15	Review CH 9 HW Ch 10: Two sample tests	10-2, 20, 38, 50
TU 9/20	Ch. 11 Simple Linear Regression	11-4, 11-7
TH 9/22	Properties of Estimators Confidence Intervals, Adequacy, Lack of Fit	11-20, 23 11-33, 11-36
TU 9/27	Correlation	11-42, 11-55, 11-57
TH 9/29	Ch 12: Multiple linear regression	
TU 10/4	Cont'd	12-2, 4
TH 10/6	Inferences in multiple regression	12-15, 20
TU 10/11	Confidence intervals; prediction Model adequacy checking	12-26, 12-27, 12-36
TH 10/13	Polynomial regression Categorical variables	
TU 10/18	Model building; Multicollinearity	12-46, 12-55
TH 10/20	Ch. 13 DOE intro	
TU 10/25	EXAM 1	
TH 10/27	Ch 13	13-1, 13-4, 13-11
TU 11/1	Continued	
TH 11/3	Random effects model	13-21, 13-22
TU 11/8	Randomized block design	13-25, 13-26
TH 11/10	CH 14 Factorial Experiments	
TU 11/15	Continued	14-1, 8
TH 11/17	General factorial	
TU 11/22	2**K designs	14-12,14-13, 14
TU 11/29	2**K designs	
TH 12/1	Blocking * Confounding (maybe!)	
TU 12/6	Fractional 2**K designs	14-31, 32, 33
TH 12/8	Ch 15 Nonparametric statistics	15-1, 2,3
TU 12/13	Wilcoxon Signed-rank test Kruskal-Wallis	15-28,30
TH 12/15 Or TU 12/20	EXAM II	

