SYLLABUS

STATISTICS FOR ENGINEERS: EE 517

Spring 2012

Spring 2011
Lecture: Friday 2:00 - 4:50 pm
email: kosko@usc.edu
voicemail: (213) 740 - 6242

Professor Kosko
Office: EEB 438
Hours: Wed 4 - 5
Fri 5 – 6

Course Summary: The course presents modern statistics with engineering applications. Emphasis is on *statistical reasoning*. Each student must develop and present a novel application of statistical multiple regression—on-site attendance is mandatory.

Required: Mendenhall, W., and Sincich, T., *Statistics for Engineering and the Sciences*, 5th edition, Prentice Hall, 2007.

Required: Hogg, R. V., and Tanis, E. A., *Probability and Statistical Inference*, 8th edition, Prentice Hall, 2010.

Recommended: Field, A., *Discovering Statistics Using SPSS*, 3rd edition, Sage, 2009.

Recommended: Carlin, B. P., and Louis, T. A., *Bayesian Methods for Data Analysis*, 3rd edition, CRC Press, 2009.

COURSE OUTLINE

JAN 13	Overview of statistics. Probability review.
JAN 20	Sampling distributions.
JAN 27	More sampling distributions. Point estimation.
FEB 3	Confidence intervals.
FEB 10	Hypothesis testing.
FEB 17	MIDTERM I. Tests for probability densities. Contingency tables.
FEB 24	Sufficient statistics. Cramer-Rao bound. Ratio hypothesis tests.
MAR 2	Sequential tests. Linear regression. Heteroscedasticity.
MAR 9	Multiple regression. Multicollinearity diagnostics.
MAR 16	No class: Spring Break.
MAR 23	Stepwise regression. Statistical process control charts.
MAR 30	MIDTERM II. Other regression types. ANOVA
APR 6	Project proposals due. Runs. Experimental design. Bayesian statistics.
APR 13	Hierarchical Bayes and Gibbs samplers. Nonparametric/robust tools.
APR 20	Class projects I—extended session. *Mandatory attendance*.
APR 27	Class projects II—extended session. *Mandatory attendance*.

GRADING PROCEDURE

Summary: Class grade depends on two midterm exams and a final project. Homework problems are optional extra credit.

1. **Midterms**. Two midterms. Each worth 25 points. Closed book. NOTE: Satisfactory performance required on both midterms to proceed to final project.

2. **Homework**. Checked and recorded. Not graded. A perfect set of worked homework problems can earn 10 points. Lesser homework sets earn fewer points. Grade stays as is if only some homework turned in. How much homework counts for how many points lies at the discretion of the instructor and teaching assistant. Students may discuss the homework problems among themselves but each student must work his or her own problems. Cheating warrants a course grade of F.

3. **Project**. Well prepared and presented *approved* project that demonstrates a *novel application* of statistics—but only after performing satisfactorily on both midterms. The project counts as the final exam and is worth 50 points. Exceptional projects can earn an automatic course grade of A. Hence: *Project excellence trumps all else*. Projects must have the instructor's written approval. Failure to present a project on schedule results in automatic course grade of F. Students who perform badly on both midterms (such as scoring a standard deviation below the class mean on the second midterm) will not qualify for a project and so will have a course grade of F. Project evaluation is at the sole discretion of the instructor. Attendance *and participation* during the project-presentation session are *mandatory*.

4. **Course Grade**. 100 points possible in course.

A	if	90 - 100
B	if	80 - 89
C	if	70 - 79
D	if	60 - 69
F	if	0 - 59

5. **Cheating**. Not tolerated. Common errors in homework and exams can count as written evidence of cheating. Penalty ranges from F on exam to F in course to recommended expulsion.