Lectures: TTh 1:00 - 2:30, 2355 G.G. Brown

Instructor: Prof. P.G. Ioannou, 2354 G.G. Brown, 764-3369

Text: CEE 631 coursepacks (several volumes)

Recommended textbooks

Outline:
Introduction to Probability and Statistics
Sample space, Events, prob. theory axioms, philosophy, Venn diagrams, P[A or B], P[A|B], P[A&B&C], pair-wise vs. mutual independence, Total Probability Theorem, Bayes Theorem, discrete and continuous distributions, joint distributions, expected value - variance - covariance and their properties, distributions (Binomial, Geometric, Negative Binomial, Exponential, Uniform, Normal), simple statistics, estimators.

Introduction to Engineering Economy
Net present value, discounting formulas, annuities, CAPM.

Decision Theory
Decision trees, sensitivity analysis, multiple sampling, decision strategies, EVPI, EVSI.

Utility theory
Axioms, certain equivalent, risk premium, utility assessment, sensitivity analysis, utility & asset position, group utility, exponential utility, delta property, EVPI, EVSI.

Subjective Probability Assessment
Correlation, range estimating, PERT 3-point estimating, Perry & Greig 3-point estimating, [pdf of u(x), direct E[u(x)], Mode(u)<>u(Mode)], discretizing the Normal distribution, probability wheel, equal-area discretization, E[X|a<X<b], biases.

Decision Analysis
Examples, putting it all together.

Multiattribute Utility
Preferential independence, utility independence, encoding, applications.

Bidding Theory
Brute-force methods 1 & 2, Low bid follows Normal distribution, distribution of the minimum of a set of random variables (Friedman model, Gates model), trial and error solution, direct solution, average-bid model.

Simulation
Monte-Carlo simulation, applications, cyclic operations, transport diagrams, cyclic activity networks, hand-simulation, Cyclone, Stroboscope, modeling with generic resources, charaterized resources and their properties, accessing the state of the simulation, dynamic decision making, experimental design.

Homework: Assignments are due next class (40% of final grade)
Midterm Exam: In-class, open book (30% of final grade), tentative date: Thursday, March 14, 2002
Final Exam: Take-home simulation project (30% of final grade)
CEE 631 HONOR CODE POLICY

All problem sets, homework assignments, etc., must be completed by each student working independently. You are allowed to consult with other students during the conceptualization of a problem but all written work, whether in scrap or final form, must be generated by you working alone. You are not allowed to sit together and work out the details of the problems with anyone.

You are not allowed to possess, look at, use, or in anyway derive advantage from the existence of solutions, term projects, or any work prepared by other students in this or past terms.

This applies to computer files as well. All work done using a computer must be yours alone and you must have entered every keystroke or mouse command. Consequently, you must never leave your computer files in directories where other students may have access to them. Doing so is equivalent to providing copies of your work to other students. Copy your files on floppy disks and erase from the computer's hard drive. If you find other peoples' files relating to this course on the computers in the Construction Lab, you should bring the matter to the attention of the instructor immediately.

Exams are taken with open books. All work during exams must be completely independent.

Violation of this policy is grounds to initiate an action that would be filed with the Dean's office and would come before the College of Engineering's Honor Council. If you have any questions about this policy, please do not hesitate to contact the Instructor.