Winter 2008

MATH 130: Finite Mathematics. 9 daily, BU 111; 11 daily, BU 110; 1 Daily, BU 111.   **INSTRUCTOR:** Fred Cutlip
OFFICE: Bouillon 117; 'phone 963-2163   **OFFICE HOURS:** 10 – 10:45, 12 –12:45

Emails: cutlipw@cwu.edu (winter quarter only), cutlipf@elltel.net. Please send your messages to both addresses.

Welcome to Math 130.1!   Before proceeding, let's make certain the course is exactly right for you.

COURSE PREREQUISITE: Prerequisite, MATH 100B or satisfactory score on SAT, ACT or COMPASS test. If in doubt see Ms. Debbie Thomas, Departmental Secretary and Generally Helpful Person, in Bouillon 108, 'phone 963-2103.

PURPOSES OF MATH 130.1:
   PREREQUISITE TO OTHER COURSES: This course will prepare you for quantitative studies in the managerial, social and behavioral sciences – e.g. statistics courses in Mathematics, Sociology, Psychology, and Management Science.

   BASIC SKILLS GRADUATION REQUIREMENT: Math 130 (or Math 102, Philosophy 201, or Computer Science 105) meets Basic Skills Requirement (d) of the General Education Program as published in the University Catalog.

TEXT: Finite Mathematics: Introductory Probability and Statistics (paperbound) , by Owen & Cutlip.
COVERAGE: Chapters 6 - 8; Chapter 9, Sections 9.1 - 9.4; Chapter 10, Sections 10.1 - 10.4.
    Optional sections as time permits: Chapter 9, Sections 9.5 - 9.8.

COURSE CONTENT: The course is essentially self-contained, and the content is accessible to all students who read reasonably well and do not have difficulties with ordinary arithmetic, including fractions, decimals and percentages. Although the prerequisite expectations are minimal, the course is not trivial. Students will become acquainted with ideas of probability and statistics and their descriptive and decision-making applications. A low-cost scientific calculator with exponentiation (Y^X) key and factorial (!) key will be helpful.
    Major components of the course are:
- Introductory concepts and notation of set theory: Sets, elements, union, intersection, complementation, Venn diagrams.
- Sorting/describing populations using tables and Venn diagrams .
- Counting techniques: tree diagrams, the Fundamental Counting Principle, permutations, combinations, and situations requiring novel techniques. Counting complements and unions of sets.
- Introductory discrete probability: language (sample space, sample point, event, simple event); assigning probabilities to simple events; probability in equiprobable sample spaces; conditional probability; independence of events; the Multiplicative Rule; Bayes' Theorem (optional).
- Reliability of systems (optional, but interesting and well-received).
- More abstract probability: Discrete random variables; describing random variables – mean, median, mode, variance, standard deviation; the binomial distribution; continuous random variables, with emphasis upon the normal distribution and its applications.
- Introductory statistics: graphical summaries of data (histograms, dot plots, Tukey's Five-Number Summary and box-and-whisker diagrams; measures of central tendency and dispersion; the sampling distribution of the mean and the Central Limit Theorem; large-sample confidence intervals for the population mean; as time permits, confidence intervals on p (the binomial success probability), and an introduction to hypothesis testing.
- Decision making using expected values; introductory game theory; life insurance viewed as a game; marginal analysis as a means of setting optimal inventory levels.

DESIRED STUDENT OUTCOMES:
- Familiarity with the basic ideas of sets, counting, probability and statistics.
- Ability to clearly express these ideas using standard language and notation.
- Ability to analyze situations involving "counting," and to select and complete appropriate counting techniques.
- Heightened awareness of "real world" situations that require decision-making in the presence of risk or uncertainty.
- Ability to quantify "risk" situations (for example: gambling, business choices, insurance) and to make "best possible" decisions.
- Consideration of one's emerging interests and abilities as indicators of possible career paths.

ATTENDANCE: Expected. Attending is one of the commitments you make when you register for this course. The text is readable and complete, but many ideas make more sense as you see them unfold in class. The give-and-take of questions and discussion is a good learning mode. <u>If you miss class, it is your responsibility to find out what was covered, announced or assigned</u>.

TESTING AND GRADING: There will be four one-hour exams (**Friday**, **1/18; Friday, 2/1; Friday, 2/15; Friday, 2/29**), each worth 50 points. No score will be dropped. Final examinations are scheduled for: <u>9 a.m. section: Tuesday, March 11, 8 - 10 a.m.; 11 a.m. section: Wednesday, March 12, 8 - 10 a.m.; 1 p.m. section: Tuesday, March 11, 12 - 2 p.m.</u> Please plan accordingly. Do not make travel or other commitments that preclude your taking all exams, including the final, with your own section as scheduled. Grade estimates based upon total point accumulation will be given after each test.

SPECIAL NOTE ON MISSED EXAMS: <u>Unavoidable</u> absence on an exam day must be cleared with your instructor (and not simply announced) <u>in advance</u>--by telephone, if necessary. Without prior clearance, a "0" will be recorded.

INCOMPLETES: An "I" is appropriate only if you have finished almost all course requirements, late-breaking developments in your life prevent your completing the course on schedule, and you have a good chance of completing the course without re-enrolling. (Example: missing the final exam due to illness.) The course must be completed within one year; otherwise, the "I" becomes an "F."

WITHDRAWALS: Subject to University policy concerning the number of withdrawals you may use, you may withdraw any time through **<u>February 20.</u>** *Please let your instructor know if you decide to withdraw.*

SUGGESTIONS FOR SUCCESS: *Attack* the course. Work together. The *prospect* of hard work annoys some people. *Doing* the work, and *experiencing success*, feels *good.* Previous Math 130 students stress "Keep up! Study consistently, not just before tests. Get into a study group; it's the only thing that saved me."

ORGANIZED HELP: Help is available on a drop-in basis in the Math tutoring center in Hertz 101. Hours were not decided at time of syllabus preparation; they will be announced later. However, *your most productive help will come in work sessions with classmates*.

LESS ORGANIZED HELP: See the instructor! You are <u>welcome</u> in his office, during scheduled office hours or at other times by arrangement *Your best bet is to make consistent use of peer study groups!*

Enjoy the quarter!