

York University — Faculty of Arts
Department of Economics

ECON 3500: Introductory Mathematical Statistics
Course Outline — Winter 2004

Course Director: **Syed A. Basher**

Office Hours: **Monday, 11:00am to 1:00pm** and by appointments

Office Location: **Vari Hall 1091**

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Teaching Assistant: **C. Tang**

TA's Office Hours: **Tuesday & Thursday: 12:00p.m. – 1:30p.m.**

TA's Office Location: **Vari Hall 1081**

Course Schedule: M 2:30 – 4:30pm; W 2:30 – 3:30pm

Venue: TEL 0007

Course Description

This course is a calculus-based introductory mathematical statistics course for undergraduate economics students. Topics to be covered include introduction to probability, conditional probability, probability distributions (discrete and continuous) and densities, mathematics of expectations, moment generating functions, functions of random variables, and sampling distributions. If time permits, we will also talk about hypothesis testing and estimation technique. Prior knowledge of elementary statistics and basic calculus is absolutely necessary.

Grading and other details

There will be two assignments, one midterm, and one final exam. The date of the midterm exam will be announced in the class. Final exam is scheduled by the registrar office and is usually available by the first week of March. Two assignments will comprise **20%** of your term grade, the midterm contributes **30%**, and the final exam carries **50%**. Your grade obeys:

$$grade = (0.5) \cdot (final) + (0.3) \cdot (midterm) + \sum_{i=1}^2 (0.1) \cdot (assignment_i)$$

The final exam will be **cumulative**, meaning it covers all materials in the course. There is **no make-up examination** for a missed midterm, students absent from the midterm for **valid** reasons may have the final carry **80 percent**. **Late submission of assignment(s) is strictly prohibited**. The grades may be scaled to conform

with the regulations of the Faculty of the Arts.

Textbook [T]: Miller I. and Miller M. "John E. Freund's Mathematical Statistics", 7th ed., Prentice Hall, 2003. Available at York bookstore.

Reference [R]: Wackerly, Mendenhall, and Scheaffer. "Mathematical Statistics with Applications", 6th ed., Duxbury, 2002. This is an excellent reference. Available at York bookstore/library.

Supplementary Readings & Miscellaneous: Additional readings and/or hand-outs may be assigned if required. The last date to drop a Winter term course without receiving a grade is on **Friday, 05 March 2004**. Old exams are downloadable from the course web.

Course Content

1. Introduction to Probability: sample space, elements of the set theory, events, definition of probability, combinatorial methods. (T: Chap. 1 and 2.1-2.5)

2. Conditional Probability: Bayes theorem; (T: Chap 2.6-2.8)

3. Random Variables and Distributions: random variables, discrete and continuous distributions, marginal and conditional distributions. (T: Chap. 3)

4. Mathematics of Expectations: the expected value of a random variable, moment generating functions, conditional expectations. (T: Chap. 4; R: Sec. 5.7)

5. Special Distributions: Bernoulli, Binomial, Poisson, normal, bivariate normal distributions. (T: Chap. 5 and 6)

6. Functions of Random Variables: moment generating function techniques. (T: Chap. 7)

7. Sampling Distributions: chi-square, t, F distributions. (T: Chap. 8)

8. Hypothesis Testing and Estimation Technique: Applications If time permits, we will take a brief tour to the world of applied statistics (regression analysis).

Note: Conduct that violates the ethical or legal standards of the University community or of one's program or specialization may result in serious consequences. Students should look at the SENATE POLICY ON ACADEMIC HONESTY which is found in the following locations: The New Students' Handbook (pp.89-94) and on the Registrar's Web Site: <http://calendars.registrar.yorku.ca/calendars/2002-2003/ug/pol/ah.htm> You are encouraged to familiarize yourself with this Senate legislation.

