FIN 7845 Statistical Methods In finance

Prerequisite: Only for PhD Students in Finance

Fall 2014 (August 25 – December 13, 2014)
M 2:00-4:45pm, Room # CBC 241

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Office Hours: M 1:00-2:00pm
Others by appointment

Drop date: November 3, 2014 (M) (Check the schedule to make sure)

Holidays: September 1(M), Nov. 11(T), Nov. 27(R), Nov. 28(F), 2014

Exam week: December 8-December 13, 2014

Please read this syllabus in its entirety. It is a part of the course content. It is important that you understand what is required in this course and the timeframes for completing assignments and activities.

Course Description

This course is intended for doctoral students who have already taken the equivalent of FIU courses such as QMB 6603 (Quantitative Methods) and FIN 6456 (Quantitative Methods in Finance), etc. A proficiency in differential calculus and matrix algebra is also required.

Major Curriculum Objective Targeted

The intent of this course is to acquaint the students with basic statistical tools including univariate probability and exact sampling distributions. NOTE THAT THE COURSE IS ON PURE THEORY OF MATHEMATICAL STATISTICS BUT WILL BE SUPPLANTED WITH ITS APPLICATION IN FINANCE AS THEY APPEAR IN THE PUBLISHED FINANCE LITERATURE. You will find the application of these concepts in the given reading list as well as your theory of finance textbook. Of course many more readings will be referenced during the course of the lecture.

Learning Objectives/Outcomes

The structure of this class makes your individual study and preparation extremely important. The lectures will focus on the major points introduced in the handouts. If you read and have at least some familiarity with the assigned chapter before the lecture, this will greatly enhance the learning experience. The lecture will focus on the more difficult aspects of each chapter and on problems which deal with the material. If you have not read the chapter and do not understand the definitions and simple concepts, you will not be able to grasp the more complex topics covered in the lecture. After the lecture, you should review your notes and in the process work relevant problems and questions at the end of the chapter.

Course Materials:

TEXTBOOK: Mathematical Statistics JN Kapur and HC Saxena, S Channd and Company Ltd India, Latest Edition

- Knowledge of excel: not required

Recommended Textbooks

(HC) Robert U. Hogg and Allen T. Craig, Introduction To Mathematical Statistics, McMillan and Co. Latest Edition

(KS) M. G. Kendall and A. Stuart, The Advanced Theory of Statistics, Vol. I., Charles Griffin and Company Limited.

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Readings: (These are very old readings. The purpose here is not to derive ideas for future research but to know the application of statistical theory in finance. Another list will be given in the middle of semester.)

Option Pricing: A Simplified Approach Cox, SA Ross, M Rubinstein - Journal of Financial Economics, 1979

Robert R Verrecchia: The Use of Mathematical Model in Financial Accounting: The Journal of Accounting Research Volume 20 Supplement 1982

Negative Binomial and Mixed Poisson Regression JF Lawless - The Canadian Journal of Statistics 1987 Vol 15, No.3 pp.209-226

RG Ibbotson, RA Sinquefield -Stocks, Bonds, Bills, and Inflation: Year-by-Year Historical Returns (1926-1974) - all 4 versions The Journal of Business, 1976

Other readings will be assigned in the class.

Course Outline:

Concepts of cumulative probability density, probability density and frequency functions in cases of discrete as well as continuous random variables. Discrete Probability Distributions: Binomial and Poisson Distributions (moments, and their recurrence relationship, moment generating and characteristics functions etc). Application of binomial stochastic process in obtaining the Options Pricing Formula, Application of Poisson stochastic process in obtaining the model for arrival and execution of market and limit orders to agents in financial markets. . Fitting of a Probability distribution: as a limiting case of binomial and Poisson distributions, moments, moment generating and characteristic functions, standard Central Limit theorem, Chehychev and Linderberg-Levy forms of Central Limit theorems.. Beta distributions of first and second kind, Gama distributions. Exact Sampling Distributions: Student's–t, Snedecor's-F, Pearson's Chi-squared and Fisher's-Z distributions, Relationship between t, chi-squared, Fisher's distributions. NOTE: If you do not want to or are extremely pressed for time, you do not have to read the books cited above. Class lectures and handouts will be more than sufficient.

Exams:

There will be two exams (CLOSED BOOK CLOSED NOTES examination). You will not be allowed to bring any formula sheet, notes etc.

Mid Term Exam: (50%)	October 20, 2014
Final Exam: (50%)	December 8, 2014 (M : 2:15- 415)

Grading:

Bonus points: 5% for participation and discussion in class

100-95	A	83-80	B-	69-67	D+
94-90	A-	79-77	C+	66-64	D
89-87	B+	76-74	C	63-60	D-
86-84	B	73-70	C-	59-00	F

Course Requirements:

- This is a first course in the finance PhD program. Most of the presentation will be in lecture format with absolutely no power point presentations..
- Course workload expectations: For every class if you can spend five hours outside the class room, it will really help you in getting good grades.
- Class attendance: It is expected that you will not miss the class unless there is some catastrophic reason to do so.
- The submission of on-time and penalties for late-work submissions: Absolutely no late assignments will be accepted
- Exam criteria and options: See above
- Exam and assignment make-up policies: No make up examination will be given unless there is a catastrophic reason. Whatever may be the case, in case you take a make up examination, you will not be eligible for bonus points.
- Class practices relating to the Internet (i.e. if students need to check their e-mail or visit web sites periodically.) NOT NEEDED
- (Optional) Group Participation requirements; None

Course Policies and Expectations:

- Students must understand that attendance in the courses is a must. Missing a class will put you so far behind that you may not be able to catch up.
- Students must recognize that doing the assignments in a timely manner will not only assist you in understanding the subject matter timely and properly, it will also facilitate me in running the progression of the course properly.

- Students must commit to absolute academic honesty.
- It is expected that students will behave in a gentlemanly fashion when the class is in progress. Whispering and/or talking when the class is in progress will not be tolerated.