First Semester 2016-2017

Course Handout Part II

Date: 02/08/2016

In addition to Part-I (General Handout for all courses appended to the timetable), this portion gives further specific details regarding the course.

COURSE NO. : **ECON F213 / FIN F213**
COURSE TITLE : **MATHEMATICAL AND STATISTICAL METHODS**
INSTRUCTOR-IN-CHARGE : **ARCHANA KULKARNI**

1. Course Description:

Application of mathematics in economic analysis – matrices, linear algebra, calculus, optimization techniques. Methods of collection and presentation of statistical data: calculation and interpretation of various measures like standard deviation, variance, kurtosis, correlation coefficient; Sampling methods – simple random sampling, with and without replacement, stratified random sampling. Statistic and sample moments. Sampling distributions – Student's t, Chi square and F distributions. Theory of estimation. Testing of hypotheses. Analysis of variance. Index Numbers. Introduction to Regression Analysis.

2. Scope and Objective:

The course objective is to introduce students to the application of mathematical and statistical methods in the analysis of economic problems. It involves a review of the mathematical fundamentals and statistical methods used in quantitative economics and finance. The student through this course will be equipped to understand and solve standard problems in beginning graduate level economics and finance using techniques from calculus, matrix algebra, optimization and statistics. These techniques lay the foundation for application by the students in subsequent courses such as micro and macroeconomics, growth theory, econometrics and so on.

3. Text Book:

Lind, Douglas A., Marchal, William G. and Wathen, Samuel A., "Statistical Techniques in Business and Economics", McGraw-Hill, 13th Edition (2008) (Reprint 2012).

4. Reference Books:

1. Chiang, Alpha.C. and Wainwright, Kevin. "Fundamental Methods of Mathematical Economics", McGraw-Hill, 4th Edition (2005).
2. Simon, Carl P. and Blume, Lawrence E., "Mathematics for Economists".
3. Sydsaeter, Knut and Hammond, Peter T., "Mathematics for Economic Analysis". Pearson Education (2002).

4. Walpole, R., Myers, R.H., Myers, S.L. and Keying, E.Ye., "Probability and Statistics for Engineers and Scientists", Pearson Education, 9th Edition (2013).
5. Anderson D., Sweeney, D. and Williams, T., Camm, J. and Cochran, J.J, "Statistics for Business and Economics", 12th Edition, Cengage Learning (2014).

5. Course Plan:

No. of Lectures	Objectives	Chapter Title	Reference (TB)
1	Introduction	Brief Review of Mathematical and Statistical Methods in Economics and Finance	Class notes
2-10	Application of Mathematical Concepts in Economic Analysis	Static Economic Models, Equilibrium, Exponents and Logarithms, Matrix Algebra, Differential Calculus, Optimization, Difference Equations	Class notes
11-14	Statistics, Data Descriptions and Presentation	Statistics, Descriptive and Inferential Statistics, Discrete and Continuous Variables, Nominal, Ordinal, Interval and Ratio Levels of Measurement, Data Descriptions, Frequency Distributions, Numerical Measures	Ch. 1, 2, 3, 4
15-17	Concept and Use of Quartiles, Deciles and Percentiles, Measures of Dispersion	Dot Plots and Box Plots, Skewness, Moments and Kurtosis	Ch. 4
18-21	Probability Concepts, Discrete and Continuous Probability Distributions	A Survey of Probability concepts, Discrete and Continuous Probability Distributions	Ch. 5, 6, 7
22-23	Sampling and Sampling Distributions	Sampling Methods and the Central Limit Theorem	Ch. 8
24-26	Estimation, Point and Interval estimation	Point Estimates, Confidence Intervals	Ch. 9
27-30	Hypothesis Testing	One and Two Sample Tests of Hypothesis, One-tailed and Two-tailed Tests of Hypothesis, Type I and II Errors, Conducting Different Tests of Hypotheses	Ch. 10, 11

31	Analysis of Variance	F-distribution, One Way and Two Way Analysis of Variance	Ch. 12
32-34	Correlation and Regression Analysis, Multiple regression	Correlation, Linear Regression, Least Squares, Assumptions, Calculation and Interpretation of Coefficient of Determination, Least Squares Estimates, Standard Error of Estimate, Confidence and Prediction Intervals	Ch. 13, 14
35-38	Non-parametric methods	Non parametric methods, Chi-square , Sign test , Signed- Rank and Rank Sum tests	Ch. 17,18 and Class notes
39-40	Theory of Index numbers	Index Numbers, Construction and Interpretation, Consumer Price Indices	Ch. 15

6. Evaluation scheme:

Component	Duration	Weightage (%)	Date and Time	Remarks
Mid-term Test	90 mins	30	***7/10 2:00 - 3:30 PM***	**CB**
Assignments/Problem Sets/Class Participation/Quizzes/Tutorials	—	30	To be announced in class	
Comprehensive Examination	3 hrs	40	12/12 FN	**Partly OB**

7. Chamber Consultation Hour: Friday, 4-5 pm.
8. Notices: Notices, if any, will be displayed on the Economics and Finance Group Notice Board.
9. Make-up Policy: Make-up will be granted only on genuine grounds and if prior permission is taken. No application will be accepted in the Exam Hall.
10. Instructor's e-mail id: archana.kulkarni@pilani.bits-pilani.ac.in.

Instructor-in-Charge

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