BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE-PILANI, HYDERABAD
FIRST SEMESTER : 2019-20

Course Handout (Part II)

01/08/2019

In addition to part -I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No.	**: ECON F213**
Course Title	**: Mathematical and Statistical Methods**
Instructor-in-Charge	**: Rishi Kumar**
Instructor	**: Rishi Kumar**

1. Scope and Objective:

This course concentrates on review of the mathematical fundamentals, statistical methods and techniques necessary for quantitative economics and finance. The course is designed to give emphasis on the application of real life examples on various fundamental issues of economics and finance.

2. Text Book:

TB. Lind A Douglas, Marchal G William & Wathen A Samuel, "Statistical Techniques in Business and Economics" 13th Edition, 2008

3. Reference Books:

R1. Stine E. Robert and Foster Dean, "Statistics for Business", Pearson Education, 1st Edition, 2011
Carl P Simon & Lawrence Blume, “Mathematics for economists”
R2. Yamane Taro, Mathematics for Economists, Eastern Economy Edition, 2nd Edition 1985
R3. Alpha Chiang and Kelvin Wainwright, “Fundamental methods of Mathematical Economics”, TMH, 4th Ed., 2005

4. Course Plan:

Topic	Lec. no.	Learning Objective	Topics to be covered	Chapter in the Text Book
1	1	Exposure to Basics of Statistics	What is Statistics?	Chapter 1 (TB)
2	2-6	Descriptive statistics	Numerical measures, Concept of Skewness, Moments and Kurtosis	Chapter 3 and 4 (TB)
3	7-10	Sampling Techniques	Sampling Methods and the Central limit theorem	Chapter 8 (TB)
4	11-18	Inferential statistics	Estimation and hypothesis testing	Chapter 9,10 and 11 (TB)
5	19-26	Correlation and regression analysis	Linear regression & correlation and Multiple Regression	Chapter 13 (TB) & Class Notes
6	27-33	Non-parametric statistics, goodness of fit test and ANOVA	Non parametric methods, Analysis of Variance and Chi-Squared Tests	Chapter 12 (TB) and Class notes
7	34-35	Index Numbers	Theory of index numbers, weighted and unweighted indices	Chapter 15 (TB)
8	36-37	Time Series	Time Series and Forecasting	Chapter 16 (TB)
9	38-42	Static Optimization	Optimization with & without constraints.	Class notes

5. Learning Outcome:

Topic 1: What is Statistics?

In this introductory topic students will be introduced to the world of statistics. The motivation for learning statistics and wide practical application across various fields will be discussed. The main objective will be to stir the interest among pupils for the subject.

Topic 2: Describing Data: Numerical measures, Concept of Skewness, Moments and Kurtosis

In this topic the students will be explained commonly used methods of describing data. The students will learn the statistical measures of skewness, moments and kurtosis. The data analysis and interpretation skills will be developed.

Topic 3: Sampling Methods and the Central limit theorem

This topic will focus on understanding the commonly employed sampling methods. One of the most important statistical concept known as the central limit theorem will be introduced to the students.

Topic 4: Estimation and hypothesis testing

The students will be introduced to the techniques of estimation and hypothesis testing using the sample data. This will equip students to employ widely used statistical techniques to real world data.

Topic 5: Linear regression & correlation (Simple Linear Regression & Multiple Regression)

The linear regression is an important statistical technique with wide application. The students will be made familiar with the theoretical underpinnings of the technique so that they will be able to practically apply this technique.

Topic 6: Non parametric methods, Analysis of Variance and Chi-Squared Tests

In this topic, we will learn about non parametric methods which are used for analysis of ranked data, contingency tables which are used for studying correlation and ANOVA.

Topic 7: Theory of index numbers, weighted and unweighted indices

Right from CPI, GVA, GDP, BSE sensex to rainfall index, the indices are everywhere. Hence, it becomes important to understand index numbers at basic level. The students will be taught regarding the various commonly used indices so that they can understand and create their own indices.

Topic 8: Time Series and Forecasting

In this topic, the students will be introduced to the basics of time series analysis with the discussion of the topics like major components of the time series, deseasonalization, smoothing of the data among others. The forecasting of time series will also be presented to the students.

Topic 9: Static Optimization

The entire economics depends on optimization. The optimization could be with or without constraints. The students will increase their learning of economics as well as finance if they know optimization techniques well. The solving techniques of optimization problems will be asset for the students because optimization is extensively used in real life problems.

6. Evaluation Scheme:

EC No.	Components	Duration	Weight age (%)	Date, Time & Venue	Nature of Component
1.	Mid-Semester Exam	90 min.	30	30/9, 11.00 -- 12.30 PM	CB
2.	Assignment-I	-	15	To be announced	OB
3.	Assignment-II	-	15	To be announced	OB
4.	Comprehensive Exam.	3 hrs.	40	4/12 AN	CB

6. **Chamber Consultation Hour:** To be announced in the class.

7. Notice: All notices pertaining to this course shall be displayed on the **Economics and Finance (or) CMS Notice Board.**

8. 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. Make up will be given only on Doctor's/Warden's recommendation and with prior (at least 01 day before the test/exam) permission of the Instructor-in-Charge/Instructor. Make-up application via sms/messages is not acceptable.

9. Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-In-Charge
ECON F213