

NagindasKhandwala College

(AUTONOMOUS)



Syllabus and Question Paper Pattern

Of

Courses of Bachelor of Commerce (B. COM.) Programme

First Year

Semester II

MATHEMATICAL AND STATISTICAL TECHNIQUES – II

Under Academic Autonomy and Credit, Grading and Semester System
With effect from Academic Year 2018-19

Syllabus of Course of B. Com. Program at Semester II

Core Course

MATHEMATICAL AND STATISTICAL TECHNIQUES – II

Modules at a Glance

Sr. No.	Modules	No. of lectures
Module 1	Functions, derivatives and their applications	15
Module 2	Shares and Mutual Funds	15
Module 3	Bivariate linear Correlation and Regression	15
Module 4	Time Series and Index Numbers	15
Module 5	Theoretical Probability Distribution	15
	Total	75

Detailed Syllabus

Module	Topics	No. of Lectures
1	Functions, derivatives and their applications	15
(a)	<p>Concept of real functions: Constant function, linear function, X^n, e^x, a^x, $\log x$. Demand, supply, Total revenue, Average revenue, Total cost, Average cost & profit function. Equilibrium point, Break-even point.</p>	
(b)	<p>Derivative of Functions: Derivative as rate measure, Derivative of X^n, e^x, a^x, $\log x$. Rules of derivatives: Scalar multiplication, sum, difference, product, quotient (Statements only), Simple problem. Second order derivative Applications: Marginal cost, Marginal revenue, Elasticity of demand. Maxima and minima for function in economics and commerce.</p>	
2	Shares and Mutual Funds:	15
(a)	Shares: Concept of share, face value, market value, dividend, equity shares, preferential shares, bonus shares. Simple examples.	
(b)	Mutual Funds: Simple problems on calculation of Net income after considering entry load, dividend, change in Net Asset Value (N.A.V.) and exit load. Averaging of price under the Systematic Investment Plan (S.I.P.)	
3	Bivariate linear Correlation and Regression	15
(a)	Correlation analysis: Meaning, Types of Correlation, Determination of Correlation: Scattered diagram, Karl Pearson's Method of Correlation Coefficient (excluding Bivariate Frequency Distribution Table) and Spearman rank correlation coefficient.	
(b)	Regression Analysis: Meaning, Concept of Regression equation, Slope of Regression line and its interpretation. Regression Coefficient (excluding Bivariate Frequency Distribution Table), Relationship between Coefficient of Correlation & Regression Coefficients, finding	

	the equation of regression lines by method of Least Squares.	
4	Time Series and Index Numbers	15
(a)	Time Series: Concepts and components of time series. Representation of trend by Freehand curve method, Estimation of Trend using moving average method and Least Squares method(linear trend only). Estimation of seasonal component using simple arithmetic mean for Additive Model only (For trend free data only). Concept of Forecasting using least square method.	
(b)	Index Numbers: Concept and usage of Index Numbers, Types of Index Numbers, Aggregate and Relative Index Numbers, Lasperye's, Paasche's, Dorbisch-Bowley's, Marshall-Edgeworth and Fisher's ideal index numbers. Cost of Living Index Numbers, Concept of real income and concept of Wholesale Price Index Number.	
5.	Elementary Probability Distribution	15
(a)	Discrete probability distribution: Binomial, Poisson(Properties and Applications only, no derivations are expected)	
(b)	Continuous Probability Distribution: Normal Distribution. (Properties and applications only, no derivations are expected)	

Reference Books

1. Mathematics for Economics and Finance Methods and Modelling by Martin Anthony and Norman Biggs, Cambridge University Press, Cambridge low-priced edition, 2000, Chapters 1, 2, 4, 6 to 9 & 10.
2. Business Mathematics By D. C. Sancheti and V. K. Kapoor, Sultan Chand & Sons, 2006, Chapter 1,5, 7, 9 &10.
3. Mathematics for Business Economics: By J. D. Gupta, P. K. Gupta and Man Mohan, Tata Mc-Graw Hill Publishing Co. Ltd., 1987, Chapters 9 to 11 & 16.
4. Quantitative Methods-Part-I By S. Saha and S. Mukerji, New Central Book Agency, 1996, Chapters 7 & 12.
5. Investments By J.C. Francis & R.W. Taylor, Schaum's Outlines, Tata Mc-Graw Hill Edition 2000, Chapters 2,4& section 25.1.

6. Indian Mutual Funds Handbook: By SundarShankaran, Vision Books, 2006, Sections 1.7,1.8.1,6.5& Annexures 1.1to 1.3.
7. Operations Research by Gupta and Kapoor, Sultan Chand and Sons pvt. Ltd. Fourth ed., 1991
8. Statistics for Management -Lovin R. Rubin D.S. (Prentice Hall of India), 7 th ed. 1998.
9. Statistics - Theory, Method & Applications D.S.Sancheti& V. K. Kapoor.,2005. Sultan Chand and Sons pvt. Ltd.
10. Introduction of Mathematical Economics – Edward T. Dowling, third edition,2012.

Examination:

Internal Assessment 25% (25 marks) :

1. One midterm class test of 20 marks (scaling down to 10 marks)
2. One assignment of 10 marks.
3. Overall participation 5 marks.

Semester End Examination 75% (75 marks)

At the end of each semester, there will be a Semester End Examination of **75**marks, 2.5 hrs. duration and question paper pattern as shown below.

Question Paper Pattern:

In **Section I (based on Mathematics)**,

A. Attempt any five questions out of eight questions. Each question carries 6 marks.

In **Section II (based on Statistics)**,

B. Attempt any three questions out of five questions. Each question carries 7 marks.

C. Attempt any three questions out of five questions. Each question carries 8 marks.