Course Name	Business Mathematics and Statistics	
Course Code	ODLCOM1143	
Credit Value	3	
Status	Year 1/Semester 1/Compulsory	
Notional hours	Independent/Self-directed learning	On site (in class)/Virtual Lectures, Lab sessions, assessments, consultation and guidance
	130	20

Course Aim

The aim of this course unit is to provide the knowledge of mathematical and statistical concepts, theories and techniques, and their applications in business and economics.

Intended Learning Outcomes

- describe the importance and application of mathematics and statistics for business and economics.
- demonstrate the use of functions and equations for business decisions
- explain the concepts and operations of matrices.
- apply the matrix operations to business decision making.
- explain the concepts and the different rules of differentiation.
- apply differentiation to business and economic problems.
- apply the rules of integration to find the summation of a given function
- use the knowledge of integration to business and economic problems.
- explain the basic concepts of business statistics
- present data using appropriate tabulation and graphical techniques
- calculate summary statistics
- apply the knowledge of basic probability in business decision making
- apply statistical inference in business and economic decisions
- calculate and interpret correlation coefficients
- develop simple linear regression models
- identify components of time series and apply basic time series models for forecasting
- construct index numbers for business and economic issues

Course Content

Introduction to financial mathematics: arithmetic and geometric sequence and series; **Basic algebra:** different types of functions and its graphs, basic concepts and skills of equations to solve the accounting, economic and business related problems; **Matrices**: types of matrices and operations, matrix inversion, finding solutions to accounting, business and economic problems using matrix applications. **Differential calculus**: rate of change, rules of differentiation, application of differential coefficient, maxima and minima of functions, and marginal concepts to utility, demand, supply, price elasticity of demand, cost, revenue and production functions, stability conditions, Cobb Web model, profit maximization, cost minimization; **Integral calculus**: rules of integration for indefinite and definite integrals, application of integration to accounting, economic and business problems including marginal revenue and total change in revenue.

Introduction to business statistics: basic concepts of business statistics, application of statistics in the business and economics, importance, scope, and limitations of statistics, elements, variables, scales of measurement, categorical and quantitative data, cross-sectional and time series data; **Descriptive Statistics**: types of data, population and sample, descriptive and inferential statistics, parameter and statistic, data collection methods, frequency distribution, bar charts and pie charts, dot plot, histogram, cumulative distributions, ogive,

stem-and-leaf display, scatter diagrams, measures of central tendency and dispersion, coefficient of variation, measures of relative standings, skewness and kurtosis, box-plot, five number summary statistics, outliers; **Probability Theory:** axioms of probability, laws of probability, mutually exclusive events, sample space, equally likely events, conditional probability, independent events, tree diagrams, Bayes' Theorem, permutations, combination, discrete and continuous random variables, Binomial, Poisson and Normal distributions, applications of the normal distribution; **Statistical Inference:** sampling distribution of sample means, point and interval estimation, confidence intervals, steps in hypothesis testing, level of significance, Type-I and Type – II errors, p-value, power of test, Z-test, *t* –test; **Correlation and Regression:** correlation, interpretation of correlation coefficient, simple linear regression, least square estimation, interpretation of regression parameters, application of regression analysis to make business decisions; **Time Series:** construction of time series plots and interpretation, components of time series, decomposition of time series components, additive and multiplicative models, moving average, exponential smoothing, forecasting; **Index Numbers:** simple and weighted average of price relative indices, Paache, Laspeyres and Fisher Indices, consumer price index, application of index numbers.	
Teaching and Learning Methods/Activities	Self-instructional printed/ non printed course materials, audio-visual aids for self-learning, Self-learning assignments, On site (in class) lectures, consultation and guidance, audio and video conferencing for virtual lectures, online learning management systems for teaching learning and assessments, Google Drive and similar collaborative tools, mobile devices, as well as a growing list of social media tools for student engagement and self-learning activities
Assessment Strategy	**Formative assessment (In-course): 30%** – At least two assessments for 30 Marks. – The assessments could take any forms such as classroom assignment, take-home assignment, quiz, presentations. **Summative Assessment: 70%** – End of course written examination is of three-hour duration. – Question paper contains two parts: – **Part I:** It is compulsory and contains 20 multiple choice questions for 20 marks. – **Part II**: These questions may include multiple parts - It contains five (05) questions that may include multiple parts and four (04) questions should be answered.

Recommended Reading:

- Bradley, T. (2019). *Essential mathematics for economics and business* (4th ed.). London: John Wiley & Sons.
- Clendenen, G., & Salzman, S. (2018). *Business mathematics* (14th ed.). London: Pearson Education.
- Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2020). *Essentials of modern business statistics with Microsoft Excel*. USA: Cengage Learning.
- Gupta, S. P., & Gupta, M. P (2019). *Business statistics* (19th ed.). India: Sultan Chand & Sons.
- Pillai, R. S. N. Bagavathi (2019). *Statistics theory and practice*. New Delhi: S. Chand Publishing.