Annexure-4

Basic Mathematics for Economic Analysis

- **Course Code** : ECON021
- **Course Abbreviation** : BMEA
- **Credits**: 4
- **Duration (per week)**: 4 hours (3 Lectures + 1 tutorial)
- **Course Objectives**:

  The objective of this course is to train basic algebras that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomics, macroeconomics, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of apply- ing mathematical techniques to economic theory in general. It contains understanding of basic functions, relations, real number systems, set operations, linear algebras and matrix operations used in economics.
- **Course Learning Outcomes**:

  The course equips the students with exposition of economic problems with formal pre- sentation algebraically and offers solution techniques to find equilibrium analysis. These tools are necessary for anyone seeking employment as an analyst in the corporate and policy framing world.

- Content (Unit-wise):

- Unit 1 : Economic Models

  Ingredients of mathematical models - variables, constants, parameters, equations, and identities; Real number system; Sets and functions; relations and their proper- ties; types of functions; functions of more than one variables; Limit, sequences and series: convergence, algebraic properties and applications; continuous functions: characterisation, properties with respect to various operations and applications; differentiable functions: characterisation, properties with respect to various operations and applications; second and higher order derivatives: properties and applications.

Unit 2 Equilibrium Analysis in Economics

Meaning of equilibrium; partial market equilibrium - linear and non-linear models; General market equilibrium

Unit 3 : Linear Models and Matrix Algebras and their Applications in Economics Matrix operations, Determinants and Cramer's Rule and their applications

- **Suggested Readings**:

- Chiang, A and Wainwright, K. (2005). Fundamental methods of mathematical economics. Boston, Mass. McGraw-Hill/Irwin.

- Sydsaeter, K., Hammond, P. (2002). *Mathematics for economic analysis*. Pearson Educational.
- Hoy, M., Livernois, J., McKenna, C., Rees, R., Stengos, T. (2001). *Mathematics for Economics*, Prentice-Hall India.

- **Course Assessment**: Internal Assessment - 25, Final Examination - 75