Microeconomics

Consumer theory: Preference, utility and representation theorem, budget constraint, choice, demand (ordinary and compensated), Slutsky equation, revealed preference axioms

Theory of production and cost: Production technology, isoquants, production function with one and more inputs, returns to scale, short run and long run costs, cost curves in the short run and long run

General equilibrium and welfare: Equilibrium and efficiency under pure exchange and production, welfare economics, theorems of welfare economics

Market structure: Perfect competition, monopoly, pricing with market power, price discrimination (first, second and third), monopolistic competition and oligopoly

Game theory: Strategic form games, iterated elimination of dominated strategies, Nash equilibrium, mixed extension and mixed strategy Nash equilibrium, examples: Cournot, Bertrand duopolies, Prisoner's dilemma

Public goods and market failure: Externalities, public goods and markets with asymmetric information (adverse selection and moral hazard)

Macroeconomics

National income accounting: Structure, key concepts, measurements, and circular flow of income - for closed and open economy, money, fiscal and foreign sector variables - concepts and measurements

Behavioural and technological functions: Consumption functions - absolute income hypothesis, life-cycle and permanent income hypothesis, random walk model of consumption, investment functions - Keynesian, money demand and supply functions, production function

Business cycles and economic models (closed economy): Business cycles-facts and features, the Classical model of the business cycle, the Keynesian model of the business cycle, simple Keynesian cross model of income and employment determination and the multiplier (in a closed economy), IS-LM Model, Hicks' IS-LM synthesis, role of monetary and fiscal policies

Business cycles and economic models (open economy): Open economy, Mundell-Fleming model, Keynesian flexible price (aggregate demand and aggregate supply) model, role of monetary and fiscal policies

Inflation and unemployment: Inflation - theories, measurement, causes, and effects, unemployment - types, measurement, causes, and effects

Growth models: Harrod-Domar, Solow and Neo-classical growth models (AK model, Romer model and Schumpeterian growth model)

Statistics for Economics

Probability theory: Sample space and events, axioms of probability and their properties, conditional probability and Bayes' rule, independent events, random variables and probability distributions, expectation, variance and higher order moments, functions of random variables, properties of commonly used discrete and continuous distributions, density and distribution functions for jointly distributed random variables, mean and variance of jointly distributed random variables, covariance and correlation coefficients

Mathematical statistics: Random sampling, types of sampling, point and interval estimation, estimation of population parameters using methods of moments and maximum likelihood procedures, properties of estimators, sampling distribution, confidence intervals, central limit theorem, law of large number

Hypothesis testing: distributions of test statistics, testing hypotheses related to population parameters, Type I and Type II errors, the power of a test, tests for comparing parameters from two samples

Correlation and regression: Correlation and types of correlation, the nature of regression analysis, method of Ordinary Least Squares (OLS), CLRM assumptions, properties of OLS, goodness of fit, variance and covariance of OLS estimator

Indian Economy

Indian economy before 1950: Transfer of tribute, deindustrialization of India

Planning and Indian development: Planning models, relation between agricultural and industrial growth, challenges faced by Indian planning

Indian economy after 1991: Balance of payments crisis in 1991, major aspects of economic reforms in India after 1991, reforms in trade and foreign investment

Banking, finance and macroeconomic policies: aspects of banking in India, CRR and SLR, financial sector reforms in India, fiscal and monetary policy, savings and investment rates in India

Inequalities in social development: India's achievements in health, education and other social sectors, disparities between Indian States in human development

Poverty: Methodology of poverty estimation, Issues in poverty estimation in India

India's labour market: unemployment, labour force participation rates

Mathematics for Economics

Preliminaries and functions: Set theory and number theory, elementary functions: quadratic, polynomial, power, exponential, logarithmic, functions of several variables, graphs and level curves, convex set, concavity and quasiconcavity of function, convexity and quasiconvexity of functions, sequences and series: convergence, algebraic properties and applications, complex numbers and its geometrical representation, De Moivre's theorem and its application

Differential calculus: Limits, continuity and differentiability, mean value theorems, Taylor's theorem, partial differentiation, gradient, chain rule, second and higher order derivatives: properties and applications, implicit function theorem, and application to comparative statics problems, homogeneous and homothetic functions: characterisations and applications

Integral calculus: Definite integrals, fundamental theorems, indefinite integrals and applications

Differential equations, and difference equations: First order difference equations, first order differential equations and applications

Linear algebra: Matrix representations and elementary operations, systems of linear equations: properties of their solution, linear independence and dependence, rank, determinants, eigenvectors and eigenvalues of square matrices, symmetric matrices and quadratic forms, definiteness and semidefiniteness of quadratic forms

Optimization: Local and global optima: geometric and calculus-based characterisations, and applications, multivariate optimization, constrained optimization and method of Lagrange multiplier, second order condition of optima, definiteness and optimality, properties of value function: envelope theorem and applications, linear programming: graphical solution, matrix formulation, duality, economic interpretation.