*IIT Kanpur Ph.D. (Economics) Admission Test Syllabus*

The PhD entrance examination would have twodifferent question papers:one for students with Economics background and another for students with Non-Economics background. Students should exercise their preference while appearing for the PhD Entrance Examination. The Details of the syllabi are given below:

## I. ECONOMICS BACKGROUND APPLICANTS

### 1.1 MACROECONOMICS

- National Income Accounting Methods
- Classical Model, Keynesian Model, IS-LM Model, Fiscal and Monetary Policies
- Solow Growth Model
- Inflation, Index Numbers
- Exchange Rate Systems
- Balance of Payments Account
- Keynesian Multipliers in an Open Economy
- Structural Reforms
- Indian Money Market and RBI's Monetary Policy

**Suggested readings:**

- Rudiger Dornbusch & Stanley Fischer. *Macroeconomics. 6th ed.* Tata Mcgraw Hill Education Private Limited, 2005.
- William H. Branson. *Macroeconomic Theory & Policy. 3rd ed.* East-West Press, 2005.

### 1.2 MICROECONOMICS

- Consumer Behaviour
- Production and Costs
- Markets – Perfect Competition, Monopoly, Monopolistic Competition, Oligopoly
- Theory of Distribution/ Theory of Factor Markets

**Suggested readings:**

- Hal R. Varian. *Microeconomic Analysis. 3rd ed*. Tata Mcgraw Hill Education Private Limited, 2005.
- Anna Koutsoyiannis. *Modern Microeconomics. 2nd ed.* Macmillan India Limited

### 1.3 MATHEMATICS, STATISTICS & BASIC ECONOMETRICS

- **Matrix Algebra:** Vectors and matrices, matrix operations, determinants.
- **Calculus:** Functions, limits, continuity, differentiation of functions of one or more variables. Unconstrained optimization, definite and indefinite integrals, integration by parts and integration by substitution.
- **Constrained and Unconstrained Optimization:** First and Second order conditions.

- **Statistics:** Elementary probability theory, conditional probability, Bayes' theorem, probability distributions – Binomial, Poisson, Uniform and Normal, measures of central tendency, skewness, kurtosis, dispersion, correlation and regression
- **Econometrics:** Assumptions of the CLRM and properties of the estimators, OLS, Gauss Markov theorem, Violations of CLRM assumptions (detection & remedies).

**Suggested readings:**

- Alpha C. Chiang & Kevin Wainwright. *FUNDAMENTAL METHODS OF MATHEMATICAL ECONOMICS. 4th ed*. McGraw Hill Education, 2013.
- Irwin Miller & Marylees Miller. *JOHN E. FREUND'S MATHEMATICAL STATISTICS WITH APPLICATIONS. 8th ed*. Pearson Education, 2014.
- Jeffrey M. Wooldridge. *INTRODUCTORY ECONOMETRICS: A MODERN APPROACH. 4th ed*. Ceneage Learning India Private Ltd., 2012.

## II. NON-ECONOMICS BACKGROUND APPLICANTS

### 1. BASIC ECONOMICS

- Demand and Supply, Concept of Elasticity, Movement along the curve versus shift of the curve
- Basic Utility Theory, Indifference Curves
- Production Function, Average Cost, Marginal Cost, Short run, Long run cost curves
- Perfect Competition and Monopoly
- National Income (GDP, GNP) and multipliers, inflation, price index number

**Suggested readings:**

- Mankiw G N. *Principles of Macroeconomics. 6th* ed. South Western, 2012.
- Robert S Pindyck & Daniel L Rubinfeld. *Microeconomics. 7th* ed. Dorling Kindersley (RS), 2008.

### 2. MATHEMATICS AND STATISTICS

- **Matrix Algebra:** Vectors and matrices, matrix operations, determinants.
- **Calculus:** Functions, limits, continuity, differentiation of functions of one or more variables. Unconstrained optimization, definite and indefinite integrals, integration by parts and integration by substitution.
- **Constrained and Unconstrained Optimization:** First and Second order conditions.
- **Statistics:** Elementary probability theory, conditional probability, Bayes' theorem, measures of central tendency, skewness, kurtosis, dispersion, correlation and regression (assumptions of the CLRM and properties of the estimators), OLS, Gauss Markov theorem, probability distributions – Binomial, Poisson, Uniform and Normal.

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- Irwin Miller & Marylees Miller. *JOHN E. FREUND'S MATHEMATICAL STATISTICS WITH APPLICATIONS. 8thed*. Pearson Education, 2014.