

## **Department of Economics**

### **Ph.D. Coursework Structure and Syllabus (w.e.f. Academic Session: 2024-25)**

#### **Semester-I**

1. PhD-EC-S-01: Research Methodology in Economics
2. PhD-EC-S-02: Data Analytics in Economic Research
3. PhD-EC-S-03: India and World Economy
4. PhD-EC-S-04: Term Paper

*Note: Paper1-3 carries the weights of 100 Marks/ 4 Credits, and Paper 4 (Term Paper) carries the weight of 50 Marks/2 Credits.*

*The evaluation will be based on both internal and final assessment.*

*The internal assessment and the final assessment carry the weightage of 40% and 60% respectively.*

## **Ph.D. Course Syllabus**

### **PhD-EC-S-01: Research Methodology in Economics**

#### **Unit-I: Introduction to research methodology**

- Philosophy of Economics research
- Objective of and types of research, problem formulation.
- Types of data and its measurement
- Qualitative data: scaling methods
- Data sources and sampling techniques.
- Thesis writing and its components

#### **Unit-II: Statistics and Mathematical Methods**

- Theoretical distribution: Normal distribution, t-distribution, Chi-square distribution, F-distribution.
- Hypothesis testing
- Statistical analysis of data: ANOVA, Factor Analysis
- Mathematical analysis of data: Input-Output Methods, Data Envelopment Analysis (DEA)
- Introduction to Computable General Equilibrium (CGE) modelling
- Exercise in statistical/mathematical softwares.

#### **Unit -III: Econometrics and Its Applications**

- Simple and multiple regression
- Problems in econometric estimation
- Introduction to simultaneous equation model
- Time series analysis: concept of stationarity, co-integration and VAR
- Exercises with econometrics software

#### **References**

- Agresti, A., & Finlay, B. (2009). *Statistical methods for the social sciences* (5th ed.). Pearson.
- Kothari, C.R. and Gaurav Garg (2014). *Research Methodology*, New Age International Publication.
- Ferber, T. and P.J. Verdoom. *Research Methods in Economics and Business*, New York: MacMillan Publication.
- Wilkinson, T.S. and P.L. Bhandarkar. *Methodology and Techniques of Social Research*, Bombay: Himalaya Publishing House.
- Freund, J. E. (1999). *Mathematical Statistics*, 5th Edition, Prentice-Hall International.
- Hogg, R.V. and A.T. Craig (1995). *Introduction to Mathematical Statistics*, Fifth Edition, Prentice-Hall International, Inc. Englewood Cliff, N.J.
- Simon, Carl P. and Lawrence Blume (1994). *Mathematics for Economists*, First Edition, 1994,
- Chiang, A.C. (1984). *Fundamental Methods of Mathematical Economics*, 3<sup>rd</sup> Edition, McGraw Hill.
- Allen, R.G.D.(1974). *Mathematical Analysis for Economists*, Macmillan Press, London.
- Sydsaeter, Knut, Peter Hammond (2002). *Essential Mathematics for Economic Analysis*, Prentice Hall.
- Gujarati, D.N. *Basic Econometrics*, 4th Edition, McGraw-Hill, New York.
- Enders, W. *Applied Econometric Time Series*, John Wiley & Sons, New York. Stock and Watson. *Introduction to Econometrics*, Pearson Publication.
- Wojciech Charemza and Derek Deadman. *New Directions in Econometric Practice: General to Specific Modeling, Cointegration, and Vector Autoregression*, Edward Elgar Publication.

## **PhD-EC-S-02: Data Analytics in Economic Research**

### **Unit I: Economic Databases: Data and Conceptual Issues**

- Macroeconomic Databases (World Development Indicators (WDI), National Account Statistics (NAS))
- Industry Databases (Annual Survey of Industry (ASI), Prowess – CMIE)
- Trade Database (UN Comtrade)
- Monetary and Financial Databases (RBI Database on Indian Economy, IMF International Financial Statistics (IFS), IMF World Economic Outlook Database, Asian Development Outlook (ADO))
- Development Databases (The National Sample Survey Office (NSSO), Periodic Labour Force Survey (PLFS))

### **Unit II: Economic Modeling and Interpretation using Stata and EViews**

- Understanding the Stata and EViews
- Data structure and management in Stata and EViews
- Multivariate Regression and Qualitative Response Model using Stata/EViews
- Panel Data Analysis using Stata
- Time Series Data Analysis using EViews

### **Unit III: Economic Modeling and Interpretation using R**

- Introduction to R Software
- Data processing and exploration
- Ridge, LASSO and Elastic Net Regression
- Classification (k-Nearest Neighbor (KNN), Discriminant Analysis)
- Clustering (K-means and hierarchical clustering)

### **References**

- Basuchoudhary, A., Bang, J. T., & Sen, T. (2017). *Machine-learning techniques in economics: new tools for predicting economic growth*. Springer.
- Cameron, A. C., & Trivedi, P. K. (2010). *Microeconometrics using stata* (Vol. 2). College Station, TX: Stata press.
- Dayal, V. (2020). *Quantitative economics with R*. Springer Singapore.
- Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.
- Wooldridge, J. M. (2016). *Introductory Econometrics: A Modern Approach* 6rd ed. Cengage learning.
- Zimmer, S., Powell, R., & Velásquez, I. (2024). *Exploring Complex Survey Data Analysis Using R: A Tidy Introduction with {srvyr} and {survey}*. CRC Press.
- IMF World Economic Outlook Databases link  
<https://www.imf.org/en/Publications/SPROLLS/world-economic-outlook-databases#sort=%40imfdate%20descending>
- Asian Development Outlook (ADO) Data Library link  
<https://data.adb.org/search/content/type/dataset>
- Han, J., Pei, J., & Tong, H. (2022). *Data mining: concepts and techniques*. Morgan kaufmann.
- Tan, P. N., Steinbach, M., & Kumar, V. (2016). *Introduction to data mining*. Pearson Education India.
- Mitchell. Tom M. (2017) *Machine Learning*. Tata McGraw Hill.
- Stata Corporation. (2023). *Stata User's Guide: Release 18*. Stata Press.
- EViews Manual
- National Sample Survey Office(NSSO) <https://www.mospi.gov.in/national-sample-survey-officensso>

- National Data Archive An online microdata library for complete metadata and unit level data of various rounds of National Sample Survey Office (NSSO) and Periodic Labour Force Survey (PLFS) <https://microdata.gov.in/nada43/index.php/home>
- World Development Indicators Database link <https://databank.worldbank.org/source/world-development-indicators>
- National Accounts Statistics (NAS) link <https://mospi.gov.in/211-national-accounts-statistics>
- National Accounts Statistics latest data link <https://www.mospi.gov.in/publication/national-accounts-statistics-2024>
- RBI Database on Indian Economy link <https://data.rbi.org.in/DBIE/#/dbie/home>

## **PhD-EC-S-03: India and World Economy**

### **Unit I: Issues in Indian Economy**

- Growth performances since 1991
- Poverty, unemployment, inequality
- Institution and governance
- Environment and development
- Financial sector reforms

### **Unit-II: Issues in world economy**

- Globalization- concept, trend and its future
- Globalization and developing countries
- Multilateralism and regionalism
- Global economic governance
- Financial market integration

### **Unit III: India and World Economy- Linkages**

- WTO and India
- Technology transfer
- Capital flows and FDI
- Multilateral financial institutional, India and developing countries
- Selected Sustainable Development Goals (SDGs): Goal 1-No Poverty, Goal 8- Decent work and Economic growth, Goal 10-Reduced Inequalities, Goal 13- Climate Action

### **References**

- Raghvendra Jha (2008). *Indian Economy-Sixty Years After Independence*. McMillan Publication.
- Caprio, Gerard, Honohan, Patrick and Stiglitz, E Joseph (2001). *Financial Liberalization: How Far, How Fast?* Cambridge University Press.
- Hoekman, B.M. and Kostecki M.M. (2001). *The Political Economy of the World Trading System: The WTO and Beyond*. Oxford University Press, Oxford.
- Krugman, P.R. and Obstfeld M. (2009). *International Economics: Theory and Policy*, Pearson, New Delhi.
- Balassa, B. (2013). *The Theory of Economic Integration*. Routledge Revivals.
- Ethier, W. (2011). Contemporary Regionalism. In M. Jovanovic (Ed.) *International Handbook on the Economics of Integration*, Vol. 1. Edward Elgar
- Frankel, J. A. (1997). *Regional Trading Blocs in the World Economic System*. Institute for International Economics, Washington DC.
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- Deepak Nayyar (2008). *Trade and Globalization*. Oxford University Press, India.
- Reddy Y.V. (Ed) (2009). *India and the Global Financial Crisis: Managing Money and Finance*. Orient Black swan, New Delhi.
- I.J. Ahulwalia and I.M.D. Litter (Ed) (2012). *India's Economic Reforms and Development: Essay for Manmohan Singh Second Edition*, Oxford University Press, New Delhi.
- Shahid Ahmed, Shahid Ashraf ( eds.) (2011). *Regional and Multilateral Trade in Developing Countries*. Routledge, New Delhi.
- Kenneth A. Reinert (2012). *An Introduction to International Economics*, Cambridge University Press.
- Sustainable Development Goals (SDGs) link <https://sdgs.un.org/goals>

## **Paper-4 Term Paper**

A manuscript of term paper (6,000-8,000 words) is to be prepared and submitted by the students under the guidance of her/his supervisor.

**A. General Guidelines:** The Term Paper will include the following:

- **Introduction/ Background of the Study:** This section will cover the background of the study and introduce the broad research area and specific research topic. The area and topic should be close to if not identical to what the student intends to pursue in her/his Ph.D.
- **Statement of the Research Problem:** This section will introduce the specific research problem, provide a literature survey (with no less than 20 research articles/ book chapters), and identify the gap(s) in the literature. This will set the scope and limitations of the proposed research.
- **Objectives of the Study:** The student should include no more than two objectives against a single research problem given the timeframe of Ph.D.
- **Data and Methodology:** The students can carry out the research using both primary and/or secondary data. The secondary data source(s) should be authentic and original wherever possible. In case of primary survey, it is important to explain the criteria for the selection of sample size and the field. The criteria should be scientific. The sample size should be in line with availability of time and other resources. The methods to analyse the data should be clearly identified and mentioned. In case, the questionnaire/ schedule is adopted for data collection, it should be attached with the Term Paper. The questionnaire should be kept as unambiguous and as focused as possible. The statistical/ econometric tools and mathematical methods (if any) used in the study must be clearly identified and described.
- **Outcome of the Study:** The significance of the study (including filling the gap in the literature) will be included in this section.

**B. General Format of the Term Paper:** The Term Paper will have the following sections:

1. Title page
2. Table of Contents
3. Preface and Acknowledgement
4. Abstract and Keywords
5. Chapter Plan

Chapter I: Introduction of the Research Problem

Chapter II: Theoretical Perspectives and Review of Literature

Chapter III: Data and Method(s) of the Study

Chapter IV: Analysis of Data and Discussion of Results

Chapter V: Conclusion and Policy Implications

6. Bibliography (as per any accepted citation style such as APA, MLA, Chicago, etc)

**C. Evaluation Guidelines**

(i) (Internal Assessment) Presentation of the Term Paper (20 marks): It will be based on the presentation of the term paper before the faculty members. It will be evaluated by the supervisor. The presentation will be of 20-25 minutes duration.

(ii) (Final Assessment) Submission (30 marks): It will be based on the manuscript term paper submitted by the student. It will be evaluated by the supervisor. Evaluation may consider the similarity report generated by the library.