INDIRA GANDHI INSTIUTE OF DEVELOPMENT RESEARCH

SEMESTER: August-December 2025

COURSE TITLE: Energy economics and Modelling

INSTRUCTOR: Manisha Jain

TEACHING ASSISTANT: -

COURSE DESCRIPTION:

This course introduces students to the foundational principles and practical tools of energy economics, with a special emphasis on energy demand analysis, energy system planning, and market structures. It covers the economic evaluation of energy projects, energy efficiency assessment, and the functioning of electricity and renewable energy markets in India. The course also includes modeling approaches used to analyze energy demand and policy impacts, supported by real-world case studies and data.

COURSE OUTCOMES:

- CO1: Calculate and apply financial indicators for energy projects.
- CO2: Distinguish between and apply top-down and bottom-up demand estimation methods.
- CO3: Assess barriers to energy efficiency and identify suitable policy interventions.
- CO4: Analyze key reforms and economic drivers in the Indian electricity sector.
- CO5: Evaluate the effectiveness of renewable energy policy instruments

COURSE REQUIREMENTS: Introduction to energy studies

EVALUATION:

- Quizzes and presentations: 40%
- Term paper: 30%
- Final paper: 30%

COURSE CONTENTS:

1. Module 1: Economic and Financial Tools

1.1 Cash flows in energy investments,

1.2 Discounting and time value of money,

1.3 Net present value, Internal rate of return, payback,

1.4 Cost of conserved energy and levelized cost of energy

2. Module 2: Energy Demand Analysis

2.1 Econometric/top-down models;

2.2 Sectoral/bottom-up modeling;

2.3 Elasticity, rebound effects

3. Module 3: Energy efficiency

3.1 Efficiency gaps, policies,

3.2 Performance standards, industrial and appliance efficiency,

4. Module 4: Electricity Markets

4.1 Power sector structure,

4.2 Pricing and reforms,

4.3 Transmission and distribution

4.4 DISCOM finances

5. Module 5: Renewable Energy Markets

5.1 RE policies in India

5.2 Renewable energy certificates markets in India

6. **Module 6: Energy Modelling and Planning**

6.1 Introduction to energy modelling tools;

6.2 Scenario analysis;

6.3 National/state modeling exercises

REFERENCES:

- Zweifel Peter, Praktiknjo Aaron and Georg Erdmann, Energy Economics: Theory and Applications, Springer 2017
- Energy economics, Concepts, Issues, Markets and Governance by Subhes C. Bhattacharya, Springer
- Introduction to energy analysis / Kornelis Blok and Evert Nieuwlaar
- Energy Systems Engineering: Evaluation and Implementation by Francis M. Vanek, Louis D. Albright and Largaus T. Angenent
- The energy system: Technology, Economics, Markets and Policy by Travis Bradford

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INDIRA GANDHI INSTIUTE OF DEVELOPMENT RESEARCH

SEMESTER: August-December 2026

COURSE TITLE: Issues in Corporate Finance and Growth

TEACHING ASSISTANT: one

COURSE DESCRIPTION: What is the relationship between growth and the financial system? This is the principal question that we would be asking in this course. Economists have disagreed sharply about the role of the financial sector in economic growth.
Lucas Robert E. (1988) "On the Mechanics of Economic Development" Journal of Monetary Economics, 22:3-42 Dismisses finance as an "over stressed" determinant of growth.

Miller M.H (1998) "Financial Markets and Economic Growth" Journal of Applied Corporate Finance, 11:8-14. "The idea that financial markets contribute to growth is a proposition too obvious for serious discussion".

Though the major policy focus has been on GDP growth in aggregate, in this course our focus would be largely on firm growth, though we would discuss GDP growth as well. We would also try to understand these disagreements and the differing policy perspectives they lead to.

COURSE OBJECTIVES: The course will be useful in understanding the role of the financial system in fostering or impeding firm growth and the by implication the growth of the overall economy. Core concepts and theory such as market efficiency, portfolio theory, CAPM, Finance constraints and the Modigiliani-Miller propositions will be taught with objective of identifying the factors that would influence firm growth.

COURSE OUTCOMES:
CO1. Understand how the financial system to facilitates firm growth
CO2. Gain exposure to different theoretical and empirical underpinnings of
Corporate Finance

COURSE REQUIREMENTS:
Course requirements include (i) a mid-term and a final exam, and (ii) a term paper with/without class presentation. This depends on time available and the number of students registering for the course. The course grade will be computed on the basis of the following weights

assigned to the different requirements:

Mid –Term Exam: 30 per cent

Final Exam: 50 per cent

Term paper with presentation: 20 per cent

- Minimum attendance of 85 per cent as per Institute rules.
- On-time attendance in class.
- Mobile phones to be kept away during class time.
- No late submissions of term paper except for documented medical reasons and emergencies.
- Academic dishonesty in any form, including plagiarism to be subject to disciplinary action as per Institute rules.
- Class participation to be considered for borderline grades

1. COURSE CONTENTS:

Introduction

i) Aivazian, V., 1998, 'Microeconomic Elements and Perspectives from Finance Theory', in J.M. Fanelli and R. Medhora (eds.), *Financial Reform in Developing Countries*, Basingstoke: Macmillan.

ii) Miller M.H (1998) "Financial Markets and Economic Growth" Journal of Applied Corporate Finance, 11:8-14.

iii) McKinnon R.I. (1973) Money and Capital in Economic Development, The Brookings Institution, Washington D.C.

2. Investment

i) Branson W.H. Macroeconomic Theory and Policy, Harper and Row, Singapore, Chapter 13.

ii) Hay, DA and Morris, Derek J (1991). Industrial Economics and Organization: Theory And Evidence, Oxford University Press. Ch. 12.

iii) Copeland T.E and Weston F.J.(1992) Financial Theory and Corporate Policy, 3 rd Edition, Addition-Wesley Publishing Company. Ch. 2.

3. Theory of Growth of the Firm

i) Hay, DA and Morris, Derek J (1991). Industrial Economics and Organization: Theory And Evidence, Oxford University Press. Ch. 10.

4. Portfolio Theory

i) Marcowitz H.M. (1987) Mean Variance Analysis in Portfolio Choice and Capital Markets Basil Blackwell Ltd., Oxford. Ch.1.

ii)Elton E.J and Gruber M.J. (1991) Modern Portfolio Theory and Investment Analysis John Wiley &Sons, Singapore. Chs 1,2 and 3.

iii)Copeland T.E. and Weston F.J.(1992) Financial Theory and Corporate Policy Addison-Wesley Publishing Co. Mass. Ch.6. 3

5. ***Market efficiency***

i**)** Fama, Eugene (1970). "Efficient Capital Markets: A Review of Theory and Empirical Work", *Journal of Finance*, 25, pp. 383-417.
ii) Fama, Eugene (1991). "Efficient Capital Markets II", *Journal of Finance*, 46, pp. 1575-617.

6.Capital Asset Pricing Model (CAPM).

i) Hay, DA and Morris, Derek J (1991). Industrial Economics and Organization: Theory And Evidence, Oxford University Press. Chs. 11

ii) Copeland T.E and Weston F.J.(1992) Financial Theory and Corporate Policy, 3 rd Edition, Addition-Wesley Publishing Company. Ch. 7.

7.Corporate Finance: Analysis of flow of funds, Cost of funds, Gearing, Retention ratio

i) Hay, DA and Morris, Derek J (1991). Industrial Economics and Organization: Theory and Evidence, Oxford University Press. Chs. 11

ii) Miller H.M. (1988) "The Modigliani-Miller Propositions after Thirty years" *Journal of Economic Perspectives*, 2(4) pp. 99-120

iii) Stiglitz J.E. (1988) "Why Financial Structure Matters" Journal of *Economic Perspectives*, 2(4) pp. 121-26.

iv) Rajan R.G. and L. Zingales (1995) "What do we know about capital structure? *Journal of Finance*.

v) Crockett, J and Friend, I (1988) "DIVIDEND POLICY IN PERSPECTIVE: CAN THEORY EXPLAIN BEHAVIOR?" *The Review of Economics and Statistics*

vi) Aivazian V. and Booth L. (2003) "Do emerging market firms follow different dividend policies from US firms? Journal of Financial Research 26(3), pp371-387

8. ***Understanding Flow of Funds Data***

i) Mayers C. (1990) "Financial Systems, Corporate Finance and Investment" in R.G. Hubbard (ed) Asymmetric Information, Corporate Finance and Investment, University of Chicago Press.

ii) Singh A. and J. Hamid (1992) "Corporate Financial Structures in Developing Countries" International Finance Corporation, Technical Paper no.1

iii Allen, F., Chakrabarti, R., De, S., & Qian, J. ". (2012). Financing Firms in India. Journal of Financial Intermediation, 21 (3), 409-445.

9. Trade Credit

i) Petersen M.A. and R.G. Rajan (1997) "Trade Credit Theories and Evidence" Review of Financial Studies" 10, pp. 661-692.

ii) Choi W.G. and Kim Y. (2005) "Trade Credit and the Effect of Macro-Financial Shocks: Evidence from U.S. panel Data " Journal of Financial and Quantitative Analysis, 40(4) pp. 897-925. 4

10. Investment once again.

i) Hubbard R.G. (1997) "Capital market imperfections and Investment" NBER Working Paper no. 5996.(also available in *Journal of Economic Literature*, Vol.36, No.1, pp. 193-225.)

ii) Athey, Michael J., and P. S. Laumas, 1994, 'Internal Funds and Corporate Investment in India', *Journal of Development Economics*, Vol.45, pp. 287-303.

iii) Fazzari, Steven M., R. G. Hubbard and B. C. Petersen, 1988, "Financing constraints and corporate investment",*Brooking Papers on Economic Activity*, Vol.1,pp.141-95.

11. Finance and Growth

i) Levine R. (1997) "Financial Development and Economic Growth: Views and Agenda" Journal of Economic Literature, 35(2) pp688-726.

ii) Rajan R.G. and L.Zingales (1998) "Financial Dependence and Growth" American Economic Review,88 pp559-586.

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Indira Gandhi Institute of Development Research

Semester: August - December 2025

Course Title: Indian Economy Instructor: S. Chandrasekhar
Office Hours: By appointment
E-mail: chandra@igidr.ac.in

Fields: Macroeconomics, Finance and Growth & Development Theory and Policy

Course Objectives: The course (re)examines economic problems, challenge of structural transformation and draws parallels with experience of other countries. Where appropriate, we refer to a theoretical framework. At the end of the course it is expected that you will be conversant with the evolution of the Indian economy post-independence, its institutional framework, competing perspectives on policies, and have a working knowledge of different databases. The course would be useful for those interested in issues relating to Indian economy, current debates, planning to undertake cross-country comparative research or undertake empirical work. Please note that we will not be focusing on impact evaluation. The emphasis is on working with unit level data, reading of review articles /papers that take stock of evidence.

Learning Outcomes:

1. Interpret the linkage (or absence of linkage) from economic growth to structural transformation
2. Situate the Indian experience against that of other countries
3. Discussion of competing perspectives on policies
4. In-depth understanding of data debates, measurement issues, and metrics that are useful for tracking the changing characteristics of Indian economy
5. Working with unit level data

Prerequisites: There will be emphasis on working with data and familiarity with STATA is required. If you decide to work with SAS or R it is fine with me. However, I will be giving the STATA do files and will be using STATA for in class data work. I expect to have at least 10 sessions in the computer lab working with unit level data.

Attendance: You are required to have 85% attendance. You are expected to be conversant with the material. Irregular attendance will affect your grade. I am not encouraging anyone to audit or sit in.

Assignments / Exams: The weights for the different components are **indicative** - Examination: 50 points, Term Paper: 25 Points, Presentation on a Topic: 15 points, Class Participation: 10 points. I plan to front load the hands on data sessions which will be held in the computer lab.

Coverage of Topics

1. India Since 1991 and Benchmarking India vis a vis Rest of the World

2. Data Debates: Household Consumption Expenditure Survey (HCES): Concepts, Data and Measurement Issues

3. Data Debates: Periodic Labour Force Survey (PLFS): Concepts, Data and Measurement Issues

4. Poverty: Concepts, Measures / Indices, Poverty Projections, Changes over Time

5. Inequality: Concepts, Measures / Indices, Changes over Time

6. Understanding Financial Sector Reforms Using Flow of Funds Data

7. Financial Assets and Liabilities of Households

8. Capital Formation

9. Structural Transformation

10. Spatial Distribution of Economic Activity: Measures / Indices, Data and Measurement Issues

11. Labour Market Outcomes

12. Urbanization and Migration

13. Industrial Performance, Export Performance, Industrial and Trade Policy

14. Decentralization, Fiscal Policy, and Subnational Finance

15. Working with Unit Level Data - HCES, PLFS, AIDIS, ASUSE, WITS, WBES

- Reading List and Papers will be made available via google drive.

Basis for Grading of Term Paper – Effort and Relevance are important. The term paper has to be written in a journal submission format. The contribution to the literature has to be evident. Each group needs to submit a proper write up and submit all files and codes.

Basis for Grading of Presentation: Effort, Adequate Research, Quality of Information Presented

Indicative Grading Scale:

- A = 4.00 (>=80)
- A- = 3.75 (75-80)
- B+ = 3.25 (65-75)
- B = 3.00 (60-65)
- B- = 2.75 (55-60)
- C+ = 2.25 (45-55)
- C = 2.00 (40-45)
- F = 0.00 (<40)

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INDIRA GANDHI INSTITUTE OF DEVELOPMENT RESEARCH

SEMESTER: Aug-Dec 2025

COURSE TITLE: Climate change: Science, Economics and Policy

INSTRUCTOR: Manisha Jain

TEACHING ASSISTANT: NA **COURSE CODE:** 6309

COURSE DESCRIPTION:

This is an introductory course on climate change. The objective of the course is to introduce students to various concepts and issues around climate change. The course will cover science, data, economics and policy aspects of climate change.

COURSE OBJECTIVES:

- Understand fundamental scientific concepts and terminology related to climate change science
- Understand the concept of carbon budget and its implications for net-zero emissions.
- Examine relevant data to assess current progress towards meeting the climate goals
- Study the challenges in meeting the climate challenge using the economic concepts
- Review the historical and current status in policy interventions to meet the climate targets

COURSE OUTCOMES:

- **CO1 – Introduce students to terms and phenomenon in climate change science**
- **CO2 – Impart knowledge on climate change science that is linked to policy response**
- **CO3 – Equip students to undertake environmental data analysis**
- **CO4 – Train students to apply economic theory to fossil fuel consumption and adoption of energy efficiency and renewable energy technologies**
- **CO5 – Inform students about the policies for climate change mitigation and adaptation**

COURSE CONTENTS:

1. Climate change science

1.1. Earth's radiative balance: Heat transfer and thermal equilibrium, units, Electromagnetic radiation, Radiative balance, Electromagnetic waves and spectrum, Planck's curves, Wein's law, and Stefan-Boltzmann equation

1.2. Earth's energy balance in the absence of atmosphere, Role of atmosphere in Earth's energy budget: Composition of the atmosphere, Scattering and reflection, Absorptivity and emissivity, Transmissivity, Sun and Earth's solar spectrum, Atmosphere transmission bands, Single-layer climate model, Global energy flows, Reflectivity and feedbacks

1.3. Enhanced greenhouse effect and effect on Earth's temperature: Radiative efficiency of greenhouse gases, Radiative forcing, Concept of climate sensitivity, Global warming potential, Changes in the composition of the atmosphere, Conversion of concentration to weight of gases in atmosphere, Forcings and feedback, Clouds and aerosols

1.4. Carbon cycle and Earth's carbon balance: Cumulative carbon emissions and CO2 concentration, Earth's carbon cycle, Changes in Earth's carbon cycle, Climate-carbon feedback, Carbon budget and net zero targets

2. Climate change data analysis

2.1. Methodology to estimate national and global CO2 emissions

2.2. Trends in CO2 emissions

2.3. Temperature data, temperature anomaly

2.4. CO2 emissions, CO2 concentration and temperature anomaly

3. Climate change economics

3.1. Cost of climate change mitigation

3.2. Cost of climate damages

3.3. Cost-benefit analysis and social cost of carbon

3.4. Discounting and ethics

4. Climate change policy

4.1. Historical developments on climate change policy

4.2. International negotiations: Kyoto protocol and Paris agreement

4.3. Policies for mitigation: carbon taxes, emissions standards, energy efficiency renewable energy

4.4. Policies for adaptation:

Grading scheme
Quizzes: 30%
Assignments: 20%
Mid-term: 20%
Final paper: 30%
Main references/papers

Main references/papers

- Human ambitions on a finite planet – Chapter 9
- Climate change science for economists - Hsiang, S. and Kopp, R.E., 2018. An economist's guide to climate change science. Journal of Economic Perspectives, 32(4), pp.3-32.
- Tietenberg Tom: Environment and Natural Resources Economics, Horper Collens Collage Publishers
- Economics of climate change by Stern Review
- Stavins, R.N., 2011. The problem of the commons: Still unsettled after 100 years. American Economic Review, 101(1), pp.81-108.
- Aldy, J.E. and Stavins, R.N., 2012. The promise and problems of pricing carbon: Theory and experience. The Journal of Environment & Development, 21(2), pp.152-180.

Additional References:

- Mutter, J.C., 2020. Climate Change Science. Columbia University Press.
- Richardson, K., Steffen, W. and Liverman, D. eds., 2011. Climate change: Global risks, challenges and decisions. Cambridge University Press.
- Climate policy foundations by Whitesell, William C
- Climate economics: Economic analysis of climate, climate change and climate policy by S.J.Tol
- The climate casino by William Nordhaus

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INDIRA GANDHI INSTIUTE OF DEVELOPMENT RESEARCH

SEMESTER: August – December 2025

COURSE TITLE: Special Topics in Oligopoly Theory **INSTRUCTOR:** Rupayan Pal

Office Hours of the Instructor: Open Door Policy & TBA timings
Office Room: RB-I, 2nd Floor, IGIDR
Telephone extn: 245

COURSE DESCRIPTION: This course will cover some selected topics of Oligopoly Theory. Usefulness of insights drawn from oligopoly theory in analysing various issues, including transnational pollution, corruption, lobbying, and resource exploitation will be specially emphasized. The focus of this course will be on reading research papers and discussing those in-depth, not just to gain a fair understanding of the state of the art in below mentioned topics, but also to gain a fair understanding of *decision making in strategic environments* in general. It would also highlight some of the unanswered/un-researched questions. Concepts developed in this course will be very useful to analyse a wide range of issues of economics, business and public policy.

COURSE OBJECTIVES: Students will (i) read and analyze original research articles published in leading journals, (ii) gain thorough understanding of issues pertaining to oligopolistic market structure and their implications, (iii) gain in-depth understanding of workings of partial equilibrium models dealing with strategic interactions (static and repeated) among economic agents under complete information and under asymmetric information, (iv) acquire skill to apply tools and insights drawn from oligopoly theory to analyze other issues.

COURSE OUTCOMES:

CO1 Students will be able to develop relevant micro-theoretic models (partial equilibrium framework) to analyse issues involving strategic interactions among agents.

CO2 Students will have an appreciation of the usefulness of theory models and limitations of existing models. They will be able to identify workable research problems of importance.

CO3 Students will be able to write theory research papers and make effective seminar presentations. Students will acquire the ability to use theoretical economic analysis to criticise the implementation of competition law and to propose improvements.

COURSE REQUIREMENTS: (Prerequisites) Microeconomics I & II. [Students are encouraged to take courses on Game Theory, though it is not a prerequisite.]

COURSE CONTENTS:

1. Preliminaries: Monopoly, Cournot, Bertrand, Stackelberg – Strategic Substitutes, Strategic Complements
2. Timings of Move, Rationing, Endogenous Choice of Strategic Variables
3. Multimarket Oligopoly & Applications to International Trade Policy
4. Strategic Delegation, Divisionalization, Entry Policy, Corruption
5. Strategic Interactions in Multiple Dimensions, Innovation, Semi-collusion
6. Bargaining Theory and its Applications to Oligopoly (If time permits)
7. Externalities, Vertical Relations, Mixed Oligopoly, Environmental Policy
8. Economics of Two-Sided Markets, Regulation

Note: The number of topics listed above is, perhaps, more than what could be covered in depth in a single semester course.

EVALUATION:

You need to make a class presentation and complete a few assignments (counts 50%) and write a Term Paper (counts 50%).

- **Class Presentation**: You will be expected to present a research paper in the class and submit a written critique (about 600 words) of that research paper ***at least five working days*** before your presentation. You will have the freedom to choose the research paper from any leading international journal. However, you need to take prior approval for that.

- **Term Paper**: The term paper should be based on an original idea, or extension of a well-known model.

- There will be some take-home assignments, which are compulsory but not graded.

LITERATURE:

A. Research papers published in reputed journals constitute the major part (more than 90%) of the main readings. **References for research papers will be given in the class.**

B. Selected Chapters of the following books will be useful as background readings.

1. Paul Belleflamme and Martin Peitz: *Industrial Organization – Markets and Strategies*, 2010, Cambridge Uni Pr.

2. Xavier Vives: *Oligopoly Pricing: Old Ideas and New Tools*, 1999, MIT Press.

3. Jean Tirole: *The Theory of Industrial Organization*, (MIT Pr.) Prentice Hall India.

4. Drew Fudenberg and Jean Tirole: *Game Theory*, 1993, MIT Press.

5. Ines Macho-Stadler and David Perez-Castrillo*: An introduction to the Economics of Information; Incentives and Contracts*, 2001, Oxford University Press

6. Patrick Bolton and Mathias Dewatripont: *Contract Theory*, 2005, MIT Press

7. Martin J. Osborne and Ariel Rubinstein: Bargaining and Markets, Version: 2005_3_2 [Freely downloadable from Ariel Rubinstein: Books (tau.ac.il) and osborne90a.pdf (sc.edu)]

8. Alison Booth: *The Economics of The Trade Union*, 1995, Cambridge Uni Pr.

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INDIRA GANDHI INSTIUTE OF DEVELOPMENT RESEARCH

SEMESTER: AUGUST- DECEMBER 2025 SEMESTER

COURSE TITLE: Banking, Corporate Finance, Contract Theory and Financial Crisis

INSTRUCTOR(S): Dr. Kaushalendra Kishore

COURSE DESCRIPTION: This is a theoretical course in which we will discuss the basics of corporate finance, banking and financial crisis.

COURSE OBJECTIVES: The first objective of this course is to teach different kinds of agency frictions such as moral hazard, adverse selection and contract incompleteness, and show how they affect corporate financing decisions, optimal contracts and welfare. In the second part of the course, the students will learn about the role banks play in the economy; and the reason and consequences of banking and financial crisis along with how regulators respond to it.

COURSE OUTCOMES:

CO1: Learn the tools of contract theory

CO2: Understand corporate financing decisions

CO3: Understand the role banks play in the economy and why banking crisis happen

COURSE REQUIREMENTS: Microeconomics I and Microeconomics II

COURSE CONTENTS:

List of topics and papers to be discussed (tentative list):

Topic 1. Moral Hazard:

Tirole chapter 3.

Innes, R. 1990. Limited liability and incentive contracting with ex ante action choices. Journal of Economic Theory

Townsend, R. 1979. Optimal contracts and competitive markets with costly state verification. Journal of Economic Theory

Gale, D. and M. Hellwig. 1985. Incentive-compatible debt contracts: the one-period problem. Review of Economic Studies

Bolton, P. and D. Scharfstein. 1990. A theory of predation based on agency problems in financial contracting. American Economic Review

Topic 2. Adverse Selection

Tirole Chapter 6

Stiglitz, J. and A. Weiss. 1981. Credit rationing in markets with imperfect information. American Economic Review

Myers, S. and N. Majluf. 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics

Allen, F. and G. Faulhaber. 1989. Signalling by underpricing in the IPO market. Journal of Financial Economics

Nachman, D. and T. Noe. 1994. Optimal design of securities under asymmetric information. Review of Financial Studies

Topic 3. Incomplete Contract

Tirole Chapter 10

Aghion, P. and P. Bolton. 1992. An incomplete contracts approach to financial contracting. Review of Economic Studies

Topic 4: Role of Banks

Chapter 2 of FR

Diamond, Douglas (1984), "Financial Intermediation and Delegated Monitoring." Review of Economic Studies 51:3, 393-414.

Diamond, Douglas, and Philip Dybvig (1983), "Bank Runs, Deposit Insurance, and Liquidity." Journal of Political Economy

Kashyap, Anil, Raghuram Rajan, and Jeremy Stein (2002), "Banks as Liquidity Providers: An Explanation for the Coexistence of Lending and Deposit-Taking." Journal of Finance

Holmström, Bengt, and Jean Tirole (1998), "Private and public supply of liquidity." Journal of Political Economy

Rajan, Raghuram (1992), "Insiders and Outsiders: The Choice Between Informed and Arm's-Length Debt." Journal of Finance 47:4, 1367-1400.

Topic 5: Financial crisis, financial stability and role of regulation

Holmström, Bengt, and Tirole, Jean (1997), "Financial Intermediation, Loanable Funds, and the Real Sector." Quarterly Journal of Economics

Goldstein, Itay, and Adi Pauzner (2005), "Demand-Deposit Contracts and the Probability of Bank Runs." Journal of Finance

Kishore, Kaushalendra (2025), "Credit Insurance, Bailout and Systemic Risk." Working paper

EVALUATION:

Student presentations - 15%

2 Mid Term exams - 50%

Assignments - 10%

Project proposal - 25%

REFERENCES:

Tirole, Jean. 2010. The Theory of Corporate Finance. (Tirole)

Bolton, Patrick and Dewatripont, Mathias. 2004. Contract Theory. (BD)

Mas-Collel, Andreu, Michael Whinston and Jerry Green: Microeconomic Theory, 2nd ed. Oxford University Press, 1995. (MWG)

Freixas, Xavier and Rochet, Jean-Charles (2008). Microeconomics of Banking, 2nd Edition. (FR)

Berk, Jonathan and DeMarzo Peter (2023). Corporate Finance. 5th Edition.

Note: As per NAAC requirements, kindly focus on employability, entrepreneurship and skill development.

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INDIRA GANDHI INSTIUTE OF DEVELOPMENT RESEARCH, MUMBAI, MH, INDIA

Course/Paper title: Publication and Research Ethics (Only for Students PhD)

Credits and Type: 2 Credits | Compulsory for second year doctoral candidates

Dates: Mondays and Tuesdays,

August to December, 2024

Time | Mondays: 1800 – 1900 hrs; Time | Tuesdays: 1430 – 1530 hrs

Venue: Hybrid (Virtual and in-person sessions)

Course convener and faculty: Sunita Sheel

About the course

The course/paper titled 'Publication and Research Ethics' comprises two credits. It is a compulsory course/paper for second year doctoral candidates and is open to others from the Indira Gandhi Institute for Development Research (IGIDR).

The course aims to help develop a better understanding of history of research ethics; root research ethics perspective both in the history of research – global and local – enterprise including collaborative research initiatives on the one hand; and global and local legal, regulatory, and human rights frameworks on the other hand. Regarding application and practices, it is to equip course participants with knowledge and skills in publication and research ethics in alignment with the specific streams at IGIDR within the broader ambit of development research.

As the course title reflects, it has two key domains although closely related with each other, namely, publication ethics and research ethics. Research ethics discourse has been informed and shaped by and evolved in the context of empirical research involving human research participants from across the world over past about more than seven decades. It primarily relates with secondary and primary/empirical research spaces. The research ethics discourse has considered research ethics issues at various stages of a research initiative in its life-span starting from prior to its conception to dissemination and publication of research findings, and when relevant beyond it for advocacy efforts in policy and legal spaces. Publication ethics discourse, principles and guidelines apply across research types – theoretical, empirical, and secondary data-based research and is also rooted in wrongs committed or happened in publishing spaces. It relates both with ethical principles and norms regarding publishing research works from across these three spaces; with wrongs committed during the life-span of research, especially data collection, analysis, and presentation. Any misconduct in terms of data fudging, manipulation, duplication, fabrication are undoubtedly is considered violation of publication

and research ethics principles. This course will provide opportunities to learn about these matters from historical and philosophical perspective,

The course will also engage with research ethics matters relating to digital-AI based technologies and allied areas. Development studies engage with secondary data sources, and primary data sources via empirical research. It is noteworthy that the contemporary context of research is also marked by ever-increasing introduction of newer and newer technologies– digital and AI based – across sectors which many researchers will require to engage with depending upon their areas of interest. This has been possible both because of the fast evolving field of data science and allied technologies, and abundance of data which can be mined for developing digital interventions. These developments in digital spaces have led to development of newer discourse in research ethics spaces and allied areas, such as, legal and regulatory ecosystems locally and globally, and evolving discourse on ethics and human rights relating to data collection, data storage, data retrieval, data sharing with third parties, and data re-use is this course will also offer opportunities to engage with these sub-fields

Overall, this course lays foundation for research that doctoral candidates will be pursing towards securing doctorates ensuring their research meets the optimum standards in publication and research ethics towards ensuring research integrity and ethically and scientifically sound doctoral research work. Furthermore, beyond the doctoral works, this course will contribute to course participants to be better placed regarding application of learnings in their professional settings. In turn, they would serve as significant human resource to take the learnings to their own ecosystems and facilitate knowledge transfer in publication and research ethics to their peers, students, and mentees.

I Goal and specific objectives

Goal

To enable participants to appreciate the salience of publication and research ethics to upholding research integrity; and identify and apply ethical reasoning to social science research particularly in development studies/research and allied thematics such as health and public health, development studies, environmental sciences-climate changes, and energy studies.

II Specific objectives

1. To learn about history and origins of research ethics discourse and principles in research ethics in social sciences and public health research and their relevance to contemporary research in social sciences and development studies.;

2. To strengthen the awareness of participants of ethical issues in research involving human participants, and their appreciation of the need for knowing and meeting research integrity standards.;

3. To draw upon the key resources in international ethics guidance such as Indian Council for Medical Research (ICMR), India guidelines for biomedical and health research in social sciences, the Tri-Council Policy Statement, Canada; the Helsinki Declaration, and other ethics guidelines issued by both national and international organizations, pertaining to the social sciences and public health fields; and help locate them in local contexts.

4. To learn about the legal, regulatory, and human rights frameworks that either form the foundation of research ethics, or complement it and/or are binding by very nature of their being statutory.

5. To learn about legal, regulatory and ethics frameworks especially relating to digital and AI based technologies.

6. To strengthen the understanding of specific concepts in research ethics (privacy, confidentiality, standard of care in experimental research designs to test developmental interventions, informed consent process, collaborative research, publication ethics, research integrity, conflict of interest); and appreciate research ethics challenges specific to research design, special groups with enhanced vulnerabilities; situational vulnerabilities in the context of research in social sciences (in health) & public health sciences.

7. To learn the application of ethical reasoning to respond to the aforesaid challenges posed by research in development studies; and enhancing skills in operationalizing research ethics principles in practice.

III Course convenor and faculty

Sunita Sheel (PhD – Anthropology; MHSc – Bioethics)

Secretary General, Forum for Medical Ethics Society;

Working Editor, Indian Journal of Medical Ethics (www.ijme.in) 3

Director, Health, Ethics and Law Institute for Training, Research and Advocacy (HEaL Institute) (www.fmesinstitute.org)

Former Fogarty International Fellow, JCB, Univ of Toronto, Toronto, Canada

Founding Trustee, Vidhayak Trust, Pune

Member, International Ethics Review Board, MSF, Geneva

My Contributions at ResearchGate

Bio-sketch

IV Learning methods

1. Session/classes will mostly be immersive and interactive supported by presentation by the course convenor-faculty.
2. Essential readings, critical appraisal of select essential readings by course participants for in-class presentations; and select readings for planned in-class deliberations.
3. These will be complemented by planned presentations on specific topics from within the scope of the curriculum by course participants based on essential readings.
4. Reading resources: essential and extended readings. Some of the essential readings will be used for pre-session readings for in-class deliberations. The rest will be for further references post-sessions, and later while preparing for doctoral research
5. Learning audio—visual resources: Short-films, and talks
   Interactive methods involving small group works to deliberate on assigned case studies, short videos; role play; and mock ethics review board meetings.
   a. Case studies sourced and developed from within India and will be complemented by those developed and informed by research outside of India, and collaborative research.
   b. Case studies relating to digital data sources, re-use and related matters will also be used given the increasing digitisation across sectors.
   c. Mock ethics review boards (M-ERBs) as way to get deeper insights into functioning of these boards. These will be constituted during the course work consisting of the course participants. They will be given mock study protocols. M-ERBs will be conducting mock ERBs later in the course to evaluate 2-3 anonymised research ethics protocols, arrive at a decision with reasoning to support the decision of M-ERB and present the same in the class and be opened for further discussion.

V. Course structure and thematics

The course is structured and organised in six thematic units for better conceptual and substantive flow between themes/concepts and their application to your own research. These thematic units are as below:

Unit 1 | Research ethics: History, principles, and key research ethics guidelines (about 3-4 classes)

Themes and topics

i. History of research ethics rooted in diverse disciplines to appreciate importance of ethics in research involving humans

ii. Idea of research, key players in research spaces, relationships amongst them; idea of ethics; and their implication to research and ethics

iii. Idea of ethics and research ethics; introduction to four principles

iv. Key research ethics guidelines – national and international; their relevance to research and research ethics practice

v. Understanding relationship between ethics, law, and human rights; relevance to research ethics in practice

Unit 2 | Translating research ethics principles into practice

Themes and topics

i. Informed consent seeking: Concept, content, operationalisation in real life, challenges, and opportunities.

ii. Maintaining privacy and confidentiality: Concept, content, operationalisation in real life research contexts, challenges, and opportunities

iii. Justice, inclusivity, and equity in research: Concept, content, operationalisation in real life research contexts, challenges, and opportunities

iv. Justice in government programs and policies

v. Risk and benefit of research: Concept, content, operationalisation in real life, challenges, and opportunities

vi. Ethics of collaborative research

vii. Critical appraisal of published research using research ethics lens

Unit 3 | Research ethics obligations and issues in relation to research designs

Research ethics matters in

i. Qualitative research,
ii. Survey research
iii. Experimental research designs
iv. Participatory research
v. Online research surveys

Unit 4 | Research integrity, publication ethics

Themes and topics

i. The idea of publication ethics; history of publications and political economy of publishing and its implications to publication ethics

ii. Misconduct, plagiarism, fabrication, falsification; salami publication

iii. Authorship credits; rights and responsibilities; different models of authorship credits; ICMJE Guidelines; Insights into COPE, WAME and other relevant guidance documents

iv. Conflict of interest and its implications and relevance to publication ethics

v. Predatory publishing practices; due diligence while choosing the journals to publish one's valuable works

vi. Obligations of data sharing as part of publication ethics obligations; issues and concerns

vii. Reporting guidelines

viii. Insights into use of AI in activities related to publishing – writing and reviewing; ICMJE, COPE and WAME Guidance on use of AI in publishing spaces

Unit 5 | Ethics, law, regulations, and justice matters in digital and AI based technologies development, deployment, and post-deployment surveillance

Topics

i. Introduction to digitalisation across sectors, and its implications to research and research ethics

ii. Proliferations of AI tools; their implications to data sets, ethics and human rights issues in re-use of data

iii. Concept of data; data ownership and custodianship;

iv. Ethics of re-using data; ethics of use of secondary data

v. Brief introduction of Ethics Guidelines for AI research in heath

Unit 6 | Research ethics governance

Topics

i. Ethics review boards (ERBs)/Institutional Ethics Committees (IECs) – what and why?

ii. Structure of ERBs; their roles, responsibilities, and mandates

iii. Reviewing research protocols by ERBs

iv. MOCK ERBs

VI. Readings

[More thematic resources aligned with each session will be shared as part of the in-session/class conversations, discussions and presentations on an on-going manner through the semester. These will be generally enlisted in the presentation by the course convenor]

1. Israel Mark and Hay Iain (2006). Research Ethics for Social Scientists: Between ethical conduct and regulatory compliance. Sage Publications. ISBN10 1 4129 0389 0; ISBN13 978 1 4129 0389 9.

2. M. N. Srinivasan, A. M. Shah, E. A. Ramaswamy (Ed.), "The field-worker and the field", Oxford University Press, 1979

3. PLoS 2011 Building the Field of Health Policy and Systems Research Social Science Matters (https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001079)

4. Journal of International Development 2009 Conducting health related social science research in low-income Settings Kenya South Africa (https://onlinelibrary.wiley.com/doi/abs/10.1002/jid.1548)

5. Journal of Infectious Diseases, 2004 Benchmarks of ethical research, What Makes Clinical Res In Dev Countries Ethical (https://academic.oup.com/jid/article/189/5/930/810459)

6. Developing World Bioethics 2016 What makes health systems research in developing Countries ethical (https://onlinelibrary.wiley.com/doi/abs/10.1111/dewb.12101)

7. BMC Medical Ethics 2012 Risk - benefit task of Research Ethics Committees An evaluation of current approaches & need to incorporate decision studies methods (https://bmcmedethics.biomedcentral.com/articles/10.1186/1472-6939-13-6

8. Liamputtong Pranee (2007). Researching the Vulnerable: A Guide to Sensitive Research Methods Sage Publications. ISBN13 978 1 4129 1253 2; ISBN13 978 1 4129 1254 9 (pbk)

9. Lee-Treweek Geraldine and Linkogle Stephanie (eds) (2006). Danger in field: Risk and ethics and social science research. Routledge.

10. Whiteman Natasha (2012). Undoing Ethics: Rethinking Practice in Online Research. Springer.

11. National Academies Press 2009 On Being a Scientist A Guide to Responsible Conduct in Research Third Edition (https://nap.nationalacademies.org/catalog/12192/on-being-a-scientist-a-guide-to-responsible-conduct-in)

12. PLoS Medicine 2009 What Should Be Done To Tackle Ghost writing in the Medical Literature

13. Indian Journal of Medical Ethics 2016 New England Journal of Medicine, Commercial COI and Revisiting the Vioxx scandal (https://ijme.in/articles/the-new-england-journal-of-medicine-commercial-conflict-of-interest-and-revisiting-the-vioxx-scandal/?galley=html

14. Steven M. Cahn (2011). Saints and Scamps: Ethics in Academia. 25th Anniversary Edition. Rowman & Littlefield Publishers, Inc. Chapter 3 Scholarship and Service, pp 41-52.

15. Sociological Research Online, 2003 Ethics and the ruling relations of research production, Ethics committee as gatekeeper (https://journals.sagepub.com/doi/abs/10.5153/sro.773?journalCode=sroa)

16. BMC Medical Ethics 2015 Innovations in research ethics governance in humanitarian settings (https://bmcmedethics.biomedcentral.com/articles/10.1186/s12910-015-0002-3)

VII Assessment and marking

Tentatively, assessment involves the following:

1. Writing a critical appraisal of a paper based on empirical research study from research ethics point of view (20 per cent of assessment)

2. An essay writing drawing upon case scenarios or your own proposed research (1000 – 1500 words) (20 percent of assessment).
3. Group work to do mock ERBs, in-class presentation of a ERB review outcomes and defending the outcome. (20 percent of assessment)

4. In-class participation in the conversation. (20 percent)

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INDIRA GANDHI INSTIUTE OF DEVELOPMENT RESEARCH

SEMESTER: August-December 2025

COURSE TITLE: Energy Applications of Econometrics

INSTRUCTOR(S): Dr. Avik Sinha

Course Description:

This course provides a hands-on introduction to econometric techniques with a strong focus on applications in Energy research. Students will learn to implement core and advanced econometric models using Excel and explore selected modern methods beyond traditional regression for solving the research problems pertaining to Energy research domain. Emphasis is placed on real-world data analysis, model interpretation, and effective presentation of results. By the end of the course, students will be able to apply econometric tools confidently in academic, policy, or business settings, with a special focus on Energy research.

Course Objective:

This course aims to equip students with practical skills to perform econometric analysis using Excel and modern methods in Energy research. It focuses on building competence in data handling, model construction, and validation techniques. Students will learn to critically assess econometric results and communicate findings effectively for developing suitable energy policies. It will also help them in developing comparative scenarios for assessing various energy-oriented scenarios across diverse contexts. Ultimately, the course prepares students to apply econometric tools confidently in various real-world scenarios and energy research projects.

Course Content:

- **Time Series Methods (in MS-Excel)**
Deconstructing the Unit root Tests, Lag Length Selection, Cointegration, Causality in MS-Excel

- **Panel Data Methods (in MS-Excel)**
Deconstructing the Panel Regression methods in MS-Excel

- **Quantile Methods (in MS-Excel)**
Deconstructing the Quantile Regression methods in MS-Excel

- **Advanced Econometric Modeling (in MS-Excel, R, Stata)**

✓ Quantile-on-Quantile Regression
✓ Multivariate Quantile-on-Quantile Regression
✓ Multivariate Quantile-on-Quantile Causality
✓ Multivariate Quantile-on-Quantile Cointegration
✓ Network Causality
✓ Wavelet Methods

• Advanced Econometric Modeling (in MS-Excel, R, Stata)
Student will be asked to formulate own econometric tool based on the research problem. The problem will be solely focused on Energy research, and they will be exposed to several energy datasets, which they will use extensively.

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INDIRA GANDHI INSTIUTE OF DEVELOPMENT RESEARCH

SEMESTER: August-December 2025.

COURSE TITLE: Time Series Analysis-1

INSTRUCTOR: R. Krishnan.

TEACHING ASSISTANT: One (Only for invigilation duty and evaluation of answer scripts)

COURSE DESCRIPTION: This course provides a detailed introduction to the theoretical and practical aspects of univariate and multivariate time series, using current methodology and software.

COURSE OBJECTIVES: The course has twin objectives: first one is to impart knowledge on how to model, estimate and predict any given time series. Specifically, students are taught the various aspects that distinguish stationary and nonstationary time series and how to model such series. Second one is to familiarise students with the various aspects of important multivariate time series techniques that will enable them to model real world macroeconomic issues and problems.

COURSE OUTCOMES:

CO1: At the end of the course, students must be able to estimate and predict any given time series, using, especially, the Box-Jenkins time series model building methodology.

CO2: Students should be able to apply the ideas to real time series data and interpret the outcomes of their analyses.

CO3: This course should enable the students to proceed to the next stage of acquiring graduate-level skills to understand time series concepts.

COURSE REQUIREMENTS: MUST have credited the core course, Econometrics II offered by the institute.

COURSE CONTENTS: Please refer to Annexure 1.

EVALUATION: Two examinations, a midsemester and a final one based on the entire syllabus.

REFERENCES: Please refer to Annexure 2.

Annexure 1

Course Outline

I. Introduction and Overview

II. Stochastic Models and Forecasting

(A) Univariate stationary processes

(1) Linear stationary models and properties

1.1 Pure AR and MA processes

1.2 Mixed (ARMA) processes

1.3 Miscellaneous topics (autocovariance generating function, sums of ARMA processes)

(2) Estimation

2.1 Conditional and exact ML estimation of ARMA models

2.2 Exact finite sample forecasts.

2.3 State space models and Kalman filter (Time permitting)

(B) Forecasting

(1) Principles of forecasting

(2) Model based forecasting -- MMSE and properties.

1.1 Principle and theory of forecasting.

1.2 Calculating forecasts based on infinite observations

1.3 Practical aspects of forecasting – Forecasts based on finite observations – Updating and confidence intervals for forecasts -- Estimation of a missing value.

1.4 Comparing forecast accuracy – Root mean square.

(C) Practical aspects of estimation and diagnostic procedures.

(D) Examples of ARMA models.

III. Univariate Non-stationary processes

(A) Linear non-stationary models: introduction and meaning
(B) Trend stationary and difference stationary processes – A comparison
(C) Univariate processes with deterministic time trend – estimation and inference
(D) Univariate processes with stochastic trend -- Concept of a unit root process – Why unit roots – Implications for hypothesis testing and interpretation.

(1) Various cases and tests for unit roots

1.1 Dickey-Fuller tests
1.2 Phillips-Perron test
1.3 Efficient unit root tests
1.4 Unit root tests under structural change
1.5 Variance ratio test
1.6 Other issues in unit root testing
1.7 Examples and implications.

IV. Permanent and Transitory components: Trend-cycle decomposition

1.1 Defining permanent and temporary components
1.2 Why extract components?
1.3 Hodrick-Prescot filter and Beveridge-Nelson decomposition

V. Intervention and outlier analysis

1.1 Transfer function models – An introduction
1.2 Models for intervention analysis – Examples
1.3 Outlier analysis – Additive and innovative outliers
1.4 Outlier detection – Estimation with known outlier timing.

VI. Modeling Volatility

Univariate ARCH models – Symmetric linear models (Engle's ARCH and GARCH models)—Asymmetric nonlinear models (EGARCH,GJR-GARCH models) -- ARCH-M models

Estimation, issues, testing and forecasting.

VI. Spectral Analysis – a gentle introduction

(1) Time series and frequency domain analysis – Why frequency domain analysis -- Meaning and concept of cycles in time series- basic concepts.

Population spectrum and periodogram – concepts and issues

1.1 Spectral representation of a stationary stochastic process and properties – Analysis of variance interpretation of a power spectrum

1.2 Parametric and non parametric Estimates of the spectrum – averaging a spectrum using lag and spectral windows -- issues involved.

1.3 Uses of spectral analysis -- Examples of spectral analysis.

Annexure 2

Select Books

Box, G.E.P., G.M.Jenkins, G.C.Reinsel (2008), Time Series Analysis: Forecasting and Control, Prentice Hall International, Inc., New Jersey.

Hamilton, J.D. (1994), Time series Analysis, Princeton University Press, Princeton, New Jersey.

Harvey, A.C. (1984) Time Series Models, Heritage Publishers, New Delhi.

Brockwell, P.J. and R.A. Davis, (2002) Introduction to Time Series and Forecasting Springer, Second Edition, New York.

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Indira Gandhi Institute of Development Research

Semester: August - December 2025

Half Credit Course (16 lectures)

Course Title: Introduction to Python for Economists

Instructor: S. Chandrasekhar

Office Hours: By appointment (Tel: 551)

E-mail: chandra@igidr.ac.in

Regular Time Slot: Tuesday 16:15-17:45 & 18:00-19:30

Fields: Econometric Theory and Applications, Microeconomics Theory and Applications, Macroeconomics,Finance and Growth, Development Theory and Policy

Background / Course Description: Whether it is in field of applied microeconomics, macroeconomics, or development economics, researchers are using alternate and unstructured datasets. A cursory search on Econlit reveals that the word 'google trends', 'twitter', 'night lights', and 'natural language processing' appeared in the abstract of 281,572, 201 and 237 papers respectively. Researchers are looking beyond traditional survey and administrative datasets.Even when administrative data sets are available (for example data from NREGA, Election Commission, eGramSwaraj websites), in most instances knowledge of web scraping, converting from PDF to excel are essential tools for building the dataset.

If you are familiar with STATA or any such statistical software, is it necessary to learn python? Yes, you might want to. First, Python is a useful tool for processing unstructured data into a form amenable for data extraction, data exploration and analysis. Second, it is a commonly used programming language for data science. Third, the world is moving towards open source 'free' software.

Learning Outcomes: The material covered in this course will help build your tool kit and aid in economic research.

1. Use Python for undertaking statistical and econometric analysis
2. Learn to work with APIs for data extraction
3. Text processing
4. Converting information which is in PDFs to a database
5. Web scraping
6. Ability to use Python codes available on websites like Github
7. Applications using alternate data
8. Review papers on big data, machine learning and econometrics.

Prerequisites: For those opting to take this course please note that this is a hands-on course where you will have to write code and build datasets. Ideally, those opting for the course should have credited Econometrics I and II.

Attendance: You will struggle to catch up if you miss even one lecture / session. So please try to maintain 100 percent attendance. We are not encouraging anyone to audit or sit in. Attendance on first day is compulsory.

Computer Sessions: You need a functional laptop.

Schedule of Lectures: I plan to request for the regular slot for lecture on Tuesday from 16:15-17:45 & 18:00-19:30. In addition to the Tuesday slot, we will also be having 4 additional lectures a week on Wednesday in the same time slot as Tuesday and Saturday morning (09:30-13:00). The first twelve lectures are on Tuesday August 5 (2 lectures), Wednesday August 6 (2 lectures), Saturday August 9 (2 lectures), Tuesday August 12 (2 lectures), Wednesday August 13 (2 lectures), Tuesday August 19 (2 lectures).

Course Content	
Topic	**Number of Lectures**
• Overview of Course, Revision of Econometrics Using Simulated Data (Stata)	2
• Revision of Econometrics Using Simulated Data (Python)	2
• Python Basics	6
• Working with APIs, JSON Format	2+2
• Text Cleaning	1
• PDF to Excel	1
• Web scraping	2+2
• In Class Work on Tuesday on the API and Web Scraping Project	September
• Deadline for submission of projects: API	September 22 by 6 pm
• Deadline for submission of projects: Web Scraping Project	October 6 by 6 pm

Evaluation: If you make an honest and complete all components of the course you can be assured of a good grade. Weights for each component are as follows.

• In-class Examinations (2 examinations) 50 points (15 and 35 points) (Date to be decided)

• Project 1 – API – Data Extraction and Analysis 25 points

• Project 2 - Web Scrape and Presentation of Data 25 points

Basis for Grading of Projects – Effort, Relevance, and Creativity (Data Visualization) are important. Project has to be related to Economics and contribution to the literature has to be evident. Each group needs to submit a proper write up and submit all files and codes.

Grading Scale Used in the Aug-Dec 2024 Semester:

- A = 4.00 (>=80)
- A- = 3.75 (75-80)
- B+ = 3.25 (65-75)
- B- = 2.75 (55-60)
- C+ = 2.25 (45-55)
- C = 2.00 (40-45)
- F = 0.00 (<40)

Books

- Florian Heiss and Daniel Brunner - Using Python for Introductory Econometrics (The e-book is affordable and is worth the price.)
- Wes McKinney - Python for Data Analysis (Open Access)
- Gábor Békés and Gábor Kézdi - Data Analysis for Business, Economics, and Policy, Cambridge University Press, 2021.
- Alan Agresti and Maria Kateri - Foundations of Statistics for Data Scientists: With R and Python (Python Codes)
- Matthew J. Salganik - Bit by Bit: Social Research in the Digital Age

Useful Material

- Kevin Sheppard - Introduction to Python for Econometrics, Statistics and Data Analysis
- Economics: APIs University of California Berkley Library

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