

# GOKHALE INSTITUTE OF POLITICS AND ECONOMICS

(Deemed to be University u/s 3 of the UGC Act, 1956)

Pune - 411004

## One-Year Post Graduate Program in Financial Economics (PGPFE)

### COURSE STRUCTURE & SYLLABUS

(Effective from the academic year 2022-23)

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## Trimester 1

### 1.1 Principles of Finance Using MS Excel

#### Learning Outcomes

1. To introduce and reinforce basic concepts and principles in finance using MS-Excel
2. To use these principles to solve real-world financial case studies
3. To understand bond pricing using these principles.

#### Module I: Basic financial concepts using MS Excel

- Simple and compound interest rates, interest rates using continuous compounding

- The mathematics behind annuities, perpetuities
- Nominal and real rates of interest
- Loan amortization schedules
- Risk, return and the statistical theory underpinning risk and return

## **Module II: Real-World Financial Case Studies**

- Investment evaluation using NPV, IRR, XNPV, MIRR
- PV, FV, PMT, PPMT, CUMPRINC, CUMIPMT and NPER functions in MS Excel
- Solver for Capital Budgeting
- Monte Carlo Simulations using MS Excel
- Pricing Stock Options Using MS Excel

## **Module III: Bond Pricing Using MS Excel**

- Pricing a zero-coupon bond
- Bond pricing, case studies
- Convexity and bond duration using MS Excel
- Calculating default risk

### **Suggested Readings:**

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1. *Wayne L. Winston, Data Analysis and Decision Making, 1st Edition, Microsoft Press*

## **1.2 Econometrics for Finance**

### **Learning Outcomes**

1. To build and enhance grasp of basic concepts and techniques for statistical and econometric analysis
2. To help students understand the appropriate application of econometric techniques to analyze financial data and interpret the results
3. To enable students to use the results of the analysis in financial decision making

### **Module I: Review of Basic Statistical and Mathematical Concepts**

- Distributions: The Poisson Distribution, The Normal Distribution, The Geometric Distribution, The Negative Binomial Distribution, The Gamma Distribution, the Central Limit Theorem,
- Trinity of classical tests (Wald test, Lagrange multiplier, Likelihood ratio)

- Parametric and Nonparametric tests.

### **Module II: The basic linear regression model**

- Estimating the regression parameters by Ordinary Least Squares (OLS), Issues related to Dummy Variable
- Appropriateness and relevance of the choice of functional form
- Violation of OLS assumptions and Diagnosis test and remedies for the Heteroscedasticity, Autocorrelation, multicollinearity, normality

### **Module III: Discrete and Limited Dependent variable**

- Linear Probability Model, Problems relating to LPM, Logit and Probit Model
- Multinomial Choice Models: Ordered Response Model; Unordered Response Model
- Censored and Truncated Regression Model

**Note: This course will be taught with the help of Python/ R and it is expected that students acquire some knowledge of Python or R before the course begins.**

### **Suggested Readings:**

#### **Books:**

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1. *Judge, G.G. et al., Introduction to the theory and Practice of econometrics, 2 nd Edition John Wiley and Sons.*
  2. *Greene, William H., Econometric Analysis, Prentice Hall. • Johnston and Dinardo, Econometric Methods, 4 th Edition McGraw-Hill International Edition.*
  3. *Wooldridge J., Introductory Econometrics: A Modern Approach, South-Western College Pub.*
  4. *Studenmund, A.H., Using Econometrics: A Practical Guide, Addison Wesley Publishing Company. Boston,*
  5. *Gujarati, Damodar, Basic Econometrics, 4 th Edition, Tata McGraw Hill Publishing Company, New Delhi*

#### **Recommended Python course (to be completed before the course) -**

- <https://www.datacamp.com/courses/intro-to-python-for-data-science>

#### **References for Python (coding) & Financial Econometrics -**

6. *Forecasting: Principles and Practice (2nd ed) - Rob J Hyndman and George Athanasopoulos*  
<https://otexts.com/fpp2/>
7. *Practical Time Series Analysis - Dr. Avishek Pal, Dr. PKS Prakash*

<https://www.oreilly.com/library/view/practical-time-series/9781788290227/>

8. *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow* - Aurélien Géron

[https://www.knowledgeisle.com/wp-content/uploads/2019/12/2-Aur%C3%A9lien-G%C3%A9ron-Hands-On-Machine-Learning-with-Scikit-Learn-Keras-and-Tensorflow\\_-Concepts-Tools-and-Techniques-to-Build-Intelligent-Systems-O%E2%80%99Reilly-Media-2019.pdf](https://www.knowledgeisle.com/wp-content/uploads/2019/12/2-Aur%C3%A9lien-G%C3%A9ron-Hands-On-Machine-Learning-with-Scikit-Learn-Keras-and-Tensorflow_-Concepts-Tools-and-Techniques-to-Build-Intelligent-Systems-O%E2%80%99Reilly-Media-2019.pdf)

9. *Hands-on Time Series Analysis with Python* - Vishwas B V, Patel Ashish

## 1.3 Financial Economics - 1

### Learning Outcomes

1. To acquaint students with the building blocks of derivatives (Module I)
2. To introduce concepts of futures contracts and their applications, including swaps (Module II)
3. To familiarize the students with thinking analytically about options (Module III)

### Module I: The Building Blocks of Derivatives

- An introduction to the concept of futures and forwards contracts
- An introduction to the mechanics of options
- How do futures contracts work on exchanges? An introduction to margins
- Hedging and the uses of hedging
- Interest rates, bonds and bond pricing

### Module II: Futures Contracts, Their Applications and Swaps

- Forwards and Futures in Detail
- Different types of Futures and Forward Contracts
- Carry Trades | Contango | Backwardation
- Plain Vanilla Swaps and their Pricing
- An introduction to CDS' and their role in the financial crisis of 2008

### Module III: An Analytical Introduction to Options

- Options and Their Pricing
- European and American Options
- Put-Call Parity Theorem
- Options Trading Strategies

### Suggested Readings:

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### Books:

1. *John C Hull: OFOD (8th Edition)*
2. *Fabozzi, Frank, Modigliani, Franco, Jones, Frank (Feb 2009), Foundations of Financial Markets*
3. *Howells, Peter, Bain, Keith (2007), Financial Markets and Institutions, 5th Edition.*

## **1.4 Financial Modeling**

### **Learning Outcomes**

1. To acquaint students with the basic building blocks of financial modeling using MS Excel (Module I)
2. To introduce to the students core financial models (Module II)
3. To familiarize students with case studies in portfolio-management using financial modeling

### **Module I: Introduction to Valuation**

- Valuation of Equity Shares A Philosophical Basis for Valuation – The Role of Valuation
- Comparable Company Analysis
- Precedent Transactions Analysis
- DiscountedCash Flow (DCF) analysis
- Dividend Discount Models
- Free Cash Flow to Equity Discount Models
- Free Cash Flow to the Firm

### **Module II: Financial Models**

- IRR and Multiple IRR
- Calculating Cost of Capital
- Gordon Model
- CAPM
- Calculating Cost of Debt
- Financial Statement Modeling
- Sensitivity procedure

### **Module III: Options valuation / Bonds**

- Introduction to portfolio models,
- Calculating efficient portfolios,
- Computing VarianceCovariance Matrix,
- Estimating Betas and Security Market Line,
- The single-index model

### **Suggested Readings:**

**Books:**

1. *Simon Benninga, Financial Modeling with Excel, 3rd Ed., MIT Press.*
2. *Bill Dalton, Financial Products-An Introduction using Mathematics and Excel, Cambridge.*
3. *Danielle Stein Fairhurst, Using Excel for Business Analysis: A Guide to Financial Modeling Fundamentals, Wiley .*
4. *Day Alastair, Mastering Financial Modeling in Microsoft Excel 3rd Edn: A Practitioner's Guide to Applied Corporate Finance (3rd Edition), FT Press, 2012.*
5. *Das, Satyajit, Structured Products, Vol.1 & 2, Wiley, (Latest Edition).*

# Trimester 2

## 2.1 Financial Econometrics

### Learning Outcomes

1. To introduce Time Series Econometrics
2. To familiarize students with Time Series Econometrics techniques for solving the issues related to Financial Economics
3. To enable students to use Python and R to handle big data and provide hands-on exercises by providing real-world financial data

### Module I: Introduction to Time Series Analysis

- Structure, Processing and Visualization of Time series data, Stationarity process, Modeling Stationary and Non-stationary Univariate Time Series
- Construction of ARMA, ARIMA, SARIMA and GRIMA Models
- Forecasting using an ARMA, ARIMA, SARIMA and GRIMA etc Model.

### Module II: Time-varying Volatility Models

- Properties, Types and Estimation of ARCH, GARCH, E-GARCH, T GARCH etc Model.

### Module III: Multivariate Time Series Analysis

- Estimation and Forecasting with VAR and SVAR Models
- Impulse responses and variance decompositions
- Cointegration and Error Correction Models
- Linear Combinations of Integrated Variables
- Co-integration and Common Trends
- Cointegration and Error Correction
- Testing for Cointegration- Engle-Granger methodology, Johansen Test

**Note: This course will be taught with the help of**

### Python/ R.Suggested Readings:

### Books:

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1. *Walter Enders (2008), Applied Econometrics Time series, Wiley India Hamilton, JD (1994) Time Series Analysis. Princeton University Press, New Jersey.*
  2. *Judge, G.G., Griffiths, W.E., Hill, R.C., Lutkepohl, H. and Lee, T.C. (1985), The Theory and Practice of Econometrics, 2nd edition John Wiley and Sons, New*

- York.
3. Johnston, J. and Dinardo, D., *Econometric Methods*, McGraw Hill, New York.
  4. Lutkepohl, Helmut (2007) *New Introduction to Multiple Time Series Analysis*, Springer, New York
  5. Rao, P., Miller, R. L. (1971), *Applied Econometrics*, Wadsworth Publishing Company.

**Recommended Python course (to be completed before the course) -**

- <https://www.datacamp.com/courses/intro-to-python-for-data-science>

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<https://otexts.com/fpp2/>
7. *Practical Time Series Analysis* - Dr. Avishek Pal, Dr. PKS Prakash  
<https://www.oreilly.com/library/view/practical-time-series/9781788290227/>
8. *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow* - Aurélien Géron  
[https://www.knowledgeisle.com/wp-content/uploads/2019/12/2-Aur%C3%A9lien-G%C3%A9ron-Hands-On-Machine-Learning-with-Scikit-Learn-Keras-and-Tensorflow\\_-Concepts-Tools-and-Techniques-to-Build-Intelligent-Systems-O%E2%80%99Reilly-Media-2019.pdf](https://www.knowledgeisle.com/wp-content/uploads/2019/12/2-Aur%C3%A9lien-G%C3%A9ron-Hands-On-Machine-Learning-with-Scikit-Learn-Keras-and-Tensorflow_-Concepts-Tools-and-Techniques-to-Build-Intelligent-Systems-O%E2%80%99Reilly-Media-2019.pdf)
9. *Hands -On Time Series Analysis with Python* - Vishwas B V, Patel Ashish

**2.2 Financial Economics - 2**

**Learning Outcomes**

1. To acquaint students with basic trading strategies using derivatives (Module I)
2. To introduce the students the underlying theories about options (Module II)
3. To familiarize students with the applications of futures, derivatives and options theory (Module III)

**Module I: The Black Scholes Model**

- An introduction to the concept of pricing options
- Black Scholes and other pricing models



- What happens when pricing models go awry?

## **Module II: Options, Greeks and Case Studies**

- The role of the 'Greeks' in pricing options
- An introduction to CDOs and CDS', including synthetic CDO's
- The Evolution of modern finance: a brief

## **Module III: Case Studies in Modern Finance**

- LTCM
- Barings Bank
- The Global Financial Crisis of 2008

## **Suggested**

## **Readings:**

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## **Books:**

1. *John C Hull: OFOD (8th Edition)*
2. *Money, 10th Ed John Wiley & sons.*
3. *Goldstein, Morris (2006), Financial Regulation after the Subprime and Credit Crisis, Washington: Peterson institute.*

## **2.3 International Finance**

### **Module I: International flow of funds and International Monetary system**

- Balance of Payments (BOP)
- Fundamentals of BOP; Accounting components of BOP
- Factors affecting International Trade and capital flows
- Agencies that facilitate International flows
- Equilibrium & Disequilibrium
- Trade deficits
- Capital account convertibility (Problems on BOP)
- International Monetary System:- Evolution
- Gold Standard
- Bretton Woods System
- The flexible exchange rate regime

- The current exchange rate arrangements
- The Economic and Monetary Union (EMU)

### **Module II: Foreign Exchange Market & Foreign Exchange exposure**

- Function and Structure of the Forex markets
- Foreign exchange market participants
- Types of transactions and Settlements Dates
- Exchange rate quotations
- Nominal, Real and Effective exchange rates
- Determination of Exchange rates in Spot markets
- Exchange rates determinations in Forward markets
- Exchange rate behavior- Cross Rates- Arbitrage profit in foreign exchange markets
- Swift Mechanism: Triangular and locational arbitrage
- Management of Translation exposure
- Management of Economic exposure
- Management of political Exposure
- Management of Interest rate exposure

### **Module III: International Financial Markets and Instruments**

- Foreign Portfolio Investment: International Bond & Equity market
- GDR, ADR, Cross-listing of shares Global registered shares
- Foreign Bonds & Eurobonds
- Global Bonds; Floating rate Notes, Zero-coupon Bonds
- International Money Markets International Banking services -Correspondent Bank, Representative offices, Foreign Branches
- Forward Rate Agreements

### **Module IV: International Parity Relationships & Forecasting Foreign Exchange rate**

- Measuring exchange rate movements
- Exchange rate equilibrium
- Factors affecting foreign exchange rate
- Forecasting foreign exchange rates; Interest Rate Parity, Purchasing Power Parity & International Fisher effect
- Covered Interest Arbitrage

### **Suggested**

### **Readings:**

## Books:

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1. *Pilbearn, Keith (2006), International Finance, Palgrave Macmillan*
2. *Heller, H.R (1974), International Monetary Economics, Prentice- Hall, Englewood Cliffs, N.J.*
3. *Thirlwall, A.P (1999), Balance of Payments Theory, 6th edition, Oxford University Press, New York*
4. *Stern, R.M.(1973), The Balance of Payments, Aldine Publishing Company, New York*
5. *Stern, R.M. (2007), Balance of Payments: Theory and Economic Policy, Aldine Transaction*
6. *Stern, R.M., Forward Exchanges, Speculation and Arbitrage, Quantitative International Economics, Boston Allyn and Bacon.*

## 2.4 Development Finance and Programme Evaluation

### Learning Outcomes

1. To acquaint students with development finance (Module I)
2. To introduce basics of program evaluation (Module II)
3. To help students understand DF and PE using three case studies related to DF & PE (Module III)

### Module I: Development Finance, An Introduction

- An introduction to the concept of development finance
- The history of development finance in the 20th century
- The limitations of development finance

### Module II: The Basics of Programme Evaluation

- The need for systematic evaluation of ongoing programmes
- An introduction to the hurdles in PE, and ways to overcome them
- Frameworks for PE

### Module III: Case Studies in Modern Finance

- Public Health
- Public Infrastructure
- Education

## **Suggested**

### **Readings:**

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### **Books:**

1. *John C Hull: OFOD (8th Edition)*
2. *Giles, Susan L., Blakely, Edward J. (2004), Fundamentals of Economic Development Finance, Sage Publications.*
3. *Atkinson, A. B. (Editor) (2004), New Sources of Development Finance, Nuffield College, Oxford University.*

## **Trimester 3**

### **Internship /Academic Research**

Students may choose to pursue either an academic research topic under the guidance of faculty member(s) approved by GIPE, *or* choose to undergo a corporate internship.

While assistance will be provided, students are primarily expected to arrange for internships on their own.