**DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSES**

# DSE 13: ADVANCED DERIVATIVES

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| **Advanced Derivatives DSE-13** | **4** | **3** | **1** | **0** | **Class XII** | **Basic Derivatives** |

**Course Objectives:**

- To equip students with understanding and implications of Greeks, Financial Swaps and Cryptocurrencies.

**Learning Outcomes:**

After studying the course the student will be able to:

- Understand Greeks, Financial Swaps, Cryptocurrencies etc.
- Understand Interest rate Futures
- Understanding of Exotic options
- Understand the concept of hedging, speculation and arbitrage.

**Unit 1: Greeks** **(12 hours)**

Calculation of delta, gamma, rho, theta and Vega for stock options (with and without dividend) and currency options. Relationship and comparison among stock Greeks. Delta Hedging, Gamma Hedging. Making a portfolio Delta Neutral, Gamma Neutral, Delta positive Gamma Neutral and Delta positive Gamma Neutral.

**Unit 2: Swaps & Interest rate Futures** **(9 hours)**

Introduction to Swaps, Interest rate swaps, currency swaps, cross-currency swaps. Understanding Credit default swaps (CDS), Valuation of CDS. CDS: Forwards and Options. Interest rate Futures, Interest rate cap and floor, FRA.

**Unit 3: Exotic options** **(12 hours)**

Nonstandard American options, Gap options, Forward start options, Cliquet options, Compound options, Chooser options, Barrier options, Binary options, Lookback options, Shout options, Asian options, Options to exchange one asset for another, Basket options.

**Unit 4: Weather, Energy and Insurance Derivatives: (12 hours)**

Introduction to Weather derivatives, Understanding HDD & CDD and its calculation. Energy Derivatives: Trading of Crude Oil, Natural Gas and Electricity, Modeling Energy prices, Understanding Insurance derivatives.

**Essential Readings:**

1. John C. Hull. Options, Futures and Other Derivatives (Eighth ed.). Pearson Education.

**Additional Readings:**

1. JurgenFranke, Wolfgang Hardle and Christian Hafner. Introduction to Statistics of

Financial Markets.

2. R. Madhumathi, M. Ranganatham. Derivatives and risk management (1st ed.) Redhead,

K. Financial Derivatives- An introduction to futures, forwards, options, swaps. Prentice

Hall of India

3. McDonald, Derivatives Markets, (latest ed.), Pearson.

4. Robert Reitano, 2010, Introduction to Quantitative Finance, MIT Press.

**Examination scheme and mode:**

Evaluation scheme and mode will be as per the guidelines notified by the University of Delhi.

## DSE 15: INFRASTRUCTURE FINANCE

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Infrastructure Finance DSE-15 | 4 | 3 | 1 | 0 | Class XII | Financial Management |

**Course Objective:**

- To equip the students to understand the basic project financing framework; the rationale for using project financing as opposed to direct conventional financing; the identification and management of risks associated with a large scale project; evaluating a project's viability using analytical tools; sources of project funds; using public-private partnerships as a mode of

project financing; and the crafting of contractual arrangements to allocate a project's risk and economic rewards among the parties involved.

**Learning Outcomes:**

After studying the course the student will be able to

- Understand the basic project financing framework and the circumstances in which project financing is likely to be appropriate.
- Integrate and apply the necessary qualitative and quantitative tools and techniques (learned in real estate and corporate finance) to evaluate project viability
- Engineer financial arrangements to allocate the risks and returns of the project to the participants in the project.

**Course Contents:**

**Unit 1 Introduction to Infrastructure Finance (9 hours)**

Infrastructure financing: Rationale, Corporations, Finance and Projects, Project company Business Model, Project Cycle, Private Finance Initiative- Origin, Types and Features, Procurement process principles , Contract and control structure , special purpose or project vehicle and financing, Public Private collaboration: Types of PPP, Financial risk in PFI and PPPs, Challenges for PFI and PPP

**Unit 2- Managing Risk in Project Finance Transactions (12 hours)**

The project cycle revisited, Risk management approaches, The project company and risk identification, Risks in the construction phase, Risk during operations- Revenue Risks, Operating Cost Risks, Technical Risks, Environmental and Social Risk, Financial Risks – Interest rate risks, Currency risks, Loan and investor syndication, Taxation risks, Legal and political risks ,Project insurance.

**Unit 3- Financial Evaluation and Financial Structure (12 hours)**

Sources of Finance: Project funding: equity and debt, Private equity: infrastructure funds, Sovereign wealth funds, Equity: issues facing investors, Debt - International development banks- A/B loans, National development banks, Export credits, Commercial bank loans, Bonds, Leasing, Offsets.

Valuation and the project company, Valuation and the project company as a single-asset business, Capital budgeting decisions

Quantitative analysis, Measures used by investors, Payback period, Present values and internal rates of return, Measures used by lenders, Debt service cover ratio, Interest cover ratio, Coverage ratios, Cash flow models

**Unit 4: Project Process and Contractual Framework (12 hours)**

The contractual framework, corporate identities and issues, Preliminary documents, Construction contract, Operations and maintenance contract, Supply contract, Sales contract, Payment structures,

Tolling contract, Contracts for difference, Availability payment, Loan agreement, Intercreditor agreement, Shareholder's agreement.

The project process, Project/public private partnership unit, Project process structure, Business plan/project information memorandum, Activities in the bid process, Procurement laws and infrastructure, Timetable and bid costs, Innovative proposals, Raising the funds, Mandate letter, Due diligence, Project monitoring

**Essential Readings:**

1. Blaiklock, M. (2014). *The infrastructure finance handbook: principles, practice and experience*. Euromoney Books

2. Pretorius, F., Chung-Hsu, B. F., McInnes, A., Lejot, P., & Arner, D. (2008). *Project finance for construction and infrastructure: principles and case studies*. John Wiley & Sons.

**Additional Readings:**

1. Esty, B. C., & Sesia, A. M. (2007). An overview of project finance and infrastructure finance 2006 update. Boston, MA: Harvard Business School.

2. Pouliquen, L. Y. (1970). Risk Analysis in project appraisal. World Bank staff occasional papers, No.11 (Washington D.C., IBR), 52-62.

**Examination scheme and mode:**

Evaluation scheme and mode will be as per the guidelines notified by the University of Delhi.

**GENERIC ELECTIVE (GE) COURSES**

## GE 11: INTRODUCTION TO DIGITAL FINANCE

### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/Practice | | |
| Introduction to Digital Finance GE- 11 | 4 | 3 | 1 | 0 | Class 12 | None |

## Learning Objectives

- To provide a foundational understanding of digital finance, encompassing key concepts, technologies, and trends shaping the financial landscape.
- To provide insights into digital payment systems, financial technology platforms, and emerging innovations, preparing them to navigate and contribute to the evolving field of digital finance.

**Learning Outcomes:**

After completing the Introduction to Digital Finance course, students will be able to:

- Understand financial technology's foundations,
- Understand digital payment systems,
- Understand fintech platforms, and emerging trends.
- Analyse the impact of digital finance on traditional models, evaluate regulatory considerations, and recognize opportunities and challenges in the rapidly evolving digital financial landscape.

**Unit 1: Foundations of Digital Finance** (**12 hours**)

**Introduction to Financial Systems**; Definition and Components of financial systems, Traditional vs. digital financial systems. **Evolution of Digital Finance**; Historical overview of financial technology (fintech), Key milestones in the development of digital finance. **Key Concepts in Digital Finance**; Digital currencies and cryptocurrencies, Mobile payments and digital wallets, Peer-to-peer lending and crowdfunding. **Regulatory Landscape**; Overview of global and Regional Regulations, Compliance and risk management in digital finance.

**Unit 2: Digital Payment Systems** (**12 hours**)

**Electronic Payments**; Credit and debit cards, Automated Clearing House (ACH) transfers. **Mobile Payments;** Mobile wallets and apps, Near Field Communication (NFC) technology. **Cryptocurrencies and Blockchain;** Introduction to blockchain technology, Bitcoin and other cryptocurrencies. **Cross-Border Payments;** Challenges and solutions in international transactions, Role of digital finance in reducing friction in cross-border payments.

**Unit 3: Financial Technology Platforms** (**11 hours**)

**Digital Banking;** Online banking services, Neobanks and their features. **Peer-to-Peer Lending;** Overview of P2P lending platforms, Risks and benefits for borrowers and lenders. **Robo-Advisors and Wealth Management;** Automation in investment advisory services, Role of artificial intelligence in financial decision-making. **Insurtech and Digital Insurance;** Innovations in the Insurance Industry, Digital platforms for insurance services.

**Unit 4: Emerging Trends and Future Perspectives** **(10 hours)**

**Artificial Intelligence in Finance;** Applications of AI in financial services, Challenges and ethical considerations. **Internet of Things (IoT) and Finance;** IoT in banking and personal finance, Security and privacy implications. **Regulatory Technology (RegTech);** Role of technology in regulatory compliance, Impact on financial institutions and regulators. **Future of Digital Finance;** Emerging technologies and trends, Social, economic, and cultural implications of digital finance.

**Essential Readings:**


- Hines, B. (2021). Digital finance: security tokens and unlocking the real potential of blockchain. John Wiley & Sons, Inc.
- Lewis, A. (2018). The Basics of Bitcoins and Blockchains.


**Additional Readings:**


- Gupta, P., & 8; Tham, M. (2018). Fintech: The New DNA of Financial Services (1st ed.).
- Vigna, P., & Casey, M. (2016). The Age of cryptocurrency: How bitcoin and the Blockchain are challenging the global economic order. First Picador edition. New York, New York, Picador/St. Martin's Press.


**Examination scheme and mode:**

Evaluation scheme and mode will be as per the guidelines notified by the University of Delhi.

## GE 13: ENTREPRENEURIAL FINANCE

### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/Practice | | |
| **Entrepreneurial Finance GE- 13** | **4** | **3** | **1** | **0** | **Class 12** | **None** |

**Learning objectives:**

- To build knowledge and skills in entrepreneurial finance.