Birla Institute of Technology & Science, Pilani
Hyderabad Campus

Second Semester 2021-22
Course Handout (Part-II)

Date: **15/01/2022**

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : **FIN F311/ ECON F354**
Course Title : ***Derivatives and Risk Management***
Instructor-in-Charge : *Shreya Biswas (shreya@hyderabad.bits-pilani.ac.in)*

Scope and Objective of the Course:

This course introduces forwards, futures & options as securities for risk management & speculation. Exposures to equity, currency, interest rate & commodity risk are examined. Pricing derivatives using analytical & numerical techniques.

The objective of this course is to familiarize the students with the various instruments available for risk management. It covers rather simpler instruments such as options, futures, swaps, and credit derivatives. Besides discussing the pricing of these instruments and hedging principles the course would also aim at introduction of some complex instruments such as options on futures and swaps etc. The course has three main objectives:

i) To understand the role of financial risk management as well as the techniques available for its measurement in financial and non-financial corporations.
ii) To review the set of financial instruments available in modern financial markets as well as the strategies that a firm or and an individual can use to optimize the management of the risks this company is faced to, and
iii) To build a framework that will help integrate financial risk management into an overall corporate strategy.

Textbooks:

1. John C. Hull & Basu Sankarshan, Options, Futures and Other Derivatives, 8th Edition, Pearson Education.

Reference books & Cases

R1. Understanding Futures Markets by Robert W. Kolb and James A. Overdahl, 6th edition, Blackwell.

R2. International Financial Management by Cheol Eun, and Bruce G. Resnick, 6th edition, McGraw-Hill.
R3. Derivatives, by Rangarajan Sundaram, Sanjiv Das, McGraw Hill, 1st edition
R4. Risk Management and Financial Institutions, John Hull.
Lecture Notes, available on the CMS

Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book
Module-1: Introduction to Risk & Derivatives Markets and Futures markets **No. of Sessions: 6**	***The student should be able to:*** understanding of various risks and derivatives products, markets, participants and structure; Evolution of the futures markets. Futures contract specifications; Convergence of futures price to spot price; Regulatory role in the futures markets; Accounting and taxations methods in the futures markets and finally should be able to differentiate futures and forwards contracts.	Project Risk vs Financial Risk, Event Risk vs Price risk; various derivatives products and their classification; Different types of market participants; Function of derivatives markets; Uses and misuses of derivatives. Characteristics of futures; Trading and Settlement in the futures markets; Margins, Marking to Market and Open Interest in the futures markets.	Text Book, Ch- 1 & 2. https:// www.nseindia.com/ products/content/ derivatives/equities/ fo.htm https:// www.mcxindia.com/ About-us http:// www.ncdex.com/ MarketData/ LiveFuturesQuotes.aspx #
Module-2: Interest rates and exchange rate mechanism **No. of Sessions: 8**	***The student should be able to:*** understand the Interest rate parity conditions.	Measuring interest rates and zero rates; Bond pricing; Determining Treasury zero rates; Duration and convexity; Theories of term structure of interest rates and yield analysis. Foreign Exchange Markets and Rates;	Text Book, Ch-4 and Ch 5 and 6 of R2.
Module-3:Determination of forward and futures prices and Interest rate Futures **(No. of Sessions: 6)**	***The student should be able to:*** Understand how the value of forward contract is determined at initiation, during life of the contract, and at expiration; Calculate and interpret the price and value of forward contract on equity stock, fixed-income security, currency and a forward rate agreement (FRA); Evaluate credit risk in a forward contract, and explain how market value is a measure	Forward Markets and Contracts; Pricing and Valuation of Equity; Fixed-Income and Interest Rate Forward Contracts; Evaluating credit risk in a forward contracts.	Text Book, ch 2 & 5.

	of exposure to a party in a forward contract.		
Module-4: Hedging Strategies using Interest, Currency, Commodity, Stock and Index Futures (No. of Sessions: 8)	***The student should be able to:*** Understand why the futures price must converge to the spot price at expiration. Determine value of futures contracts; Understand as to why forward and futures price differ; understand the relation between futures prices and expected spot prices; and appreciate the difficulties in pricing short-term futures contracts;	Basic Principles, Arguments for and against hedging; Basis Risk; Cross hedging; Stack and roll; Hedging with Forwards; Non Deliverable Forwards; Currency Futures; Pricing Currency Futures; Hedging, Speculation and Arbitrage with Currency Futures; Basics of Treasury bond futures and Eurodollar futures; Short-term interest rate futures contracts; Intermediate and long-term interest rate futures contracts; Hedging, Speculation, Arbitrage with commodity futures; Pricing of forward and futures, Normal Backwardation Convergence; Basis risk, optimal hedge ratio; Trading of Index Futures; Pricing of single and index futures, Risk Adjustment, Hedging, Speculation, and Arbitrage with Index Futures.	Text Book, ch 3,6, and Ch 5, 7 and 9
Module-5: Swaps and Options (Mechanics, Properties, Trading Strategies, Binomial Tress, Wiener Process & Ito's Lemma and BSM Model) **No. of Sessions: 12**	***The student should be able to:*** Understand the distinction between pricing and valuation of swaps; Understand interest rate swaps to a series of off-market forward rate agreements (FRAs) and a plain vanilla swap to a combination of an interest rate call and a put option; Calculate and interpret the fixed rate on a plain vanilla interest rate swap and the market value of the swap during its life; Calculate and interpret the fixed rate if applicable, and the foreign notional principal for a given domestic notional principal on a currency swap, and estimate	Currency Swaps;, Interest Rate Swaps; Forward Rate Agreement; Applications of swaps, Cancellation, Pricing of Swaps – Interest Rate & Currency Swap; Swap variant; Basics of call and put options, Their payoffs, Intrinsic value and time value, American and European options, At the money, out of money and in the money options, Bounds to option pricing, Arbitrage based price limits, Put call parity; Binomial Option Pricing model, Risk Neutral valuation, Black Scholes option pricing model and assumptions,	Text Book, ch 7, 9, 10,11 and 12 https:// www.nseindia.com/ products/content/ derivatives/equities/ fo.htm http:// www.cmegroup.com/ company/ http://www.jpx.co.jp/ english/derivatives/ index.html

	the market values of currency swaps during their lives. Explain and interpret the characteristics and use of swaptions, and calculate the payoffs and cash flows of an interest rate swaption; Understanding Option Markets and Contracts – Variants, Payoffs, Pricing and Hedging strategy; put call parity; difference between American & European options; General shape of the graph of the straddle strategy; Strips and straps, strangles, the bull spread strategy; The bear spread strategy; The butterfly spread strategy; The collar strategy; One and two step binomial pricing models and BS pricing methodology	Interpretation of Black Scholes model; Straddle, Strangle, Butterfly, Bull and Bear spread, Ratio spread, Box spread, Condor, Synthesizing with options.	

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Quiz-1	10 Minutes	10%	TBA one week prior to the quiz date, Time: Class hour	OB
Quiz-2	10 Minutes	10%	TBA one week prior to the quiz date, Time: Class hour	OB
Group Assignment		10%	April 1st week, 2021 (exact date will be announced later)	OB
Mid-semester Exam	1.5hour	30%	11/03 3.30pm to5.00pm	OB
Comprehensive Exam	2 Hour	40%	10/05 AN	CB

Chamber Consultation Hour: Thursday and Friday- 4:00p.m.-5:00p.m. (with prior email appointment)
Notice: All notices will be displayed on CMS and Economics & Finance Notice Board.
Make-up policy: Make-up will be given only on Doctor's/Warden's recommendation and with prior (at least 01 day before the test/exam) permission of the InstructorinCharge/Instructor.

Component	Date	Mode
Quiz-1	Exact syllabus and mode of exam will be informed through CMS	
Quiz-2	Exact syllabus and mode of exam will be informed through CMS	

*Note: No make-ups for the quizzes. Both quizzes will be counted for final grade calculation.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-Charge
FIN F311 & ***ECON F354***