Course title: Derivatives and Risk Management			
Course code: PPM 123	**No. of credits:** 2	**L-T-P distribution: 28-0-0**	**Learning hours:** 28
Pre-requisite course code and title (if any):			
Department: Department of Business and Sustainability			
Course coordinator(s):		**Course instructor(s):**	
Contact details:			
Course type: Elective		**Course offered in:** Semester III	

Course description

Risk is all pervasive. For business the various kinds of risk relate to price, interest rates, foreign exchange rates, credit etc. Of late tactical management of these risks has gained prominence especially with advent of derivative products. The course concerns with tactical management of these risk through investment in financialassets. More specifically, the course will deal with the pricing and use of financial derivatives, including options, forwards, futures, swaps and credit derivatives as risk management tools. Financial derivatives are used by institutions as well as investors, sometimes to hedge (reduce) unwanted risks, sometimes to take on additional risk motivated by views regarding future market movements. Through this perspective, the course will also highlight the uses and abuses of financial derivatives with respect to the various incidents that had already happened in the markets.

Course objectives

The objective of this course is to familiarize the participants 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 swapsetc.

Course contents

Module	Topic	L	T	P
1	Forwards and Futures, Trading and Settlement, Margins, Marking to Market, Open Interest	2	0	0
2	**Commodity Futures** Hedging, Speculation, Arbitrage with commodity futures, Pricing of forward and futures, Normal Backwardation Convergence, Basis risk, optimal hedge ratio **Chapter 3**	2	0	0
3	**Currency Forwards and Futures** Foreign Exchange Markets, and Rates, Hedging with Forwards, Non-Deliverable Forwards, Currency Futures, Pricing Currency Futures, Hedging, Speculation, and Arbitrage with Currency Futures **Chapter 5**	2	0	0
4	**Stock and Index Futures** Trading of Index Futures, Pricing, Risk Adjustment, Hedging, Speculation, and Arbitrage with Index Futures **Chapter 4**	2	0	0
5	**Options** 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,	2	0	0

	Arbitrage based price limits, Put call parity Chapter 8 & 9			
6	**Option Pricing** Binomial Option Pricing model **Chapter 10** **Chapter 12 & 13**	2	0	0
7	**Option Pricing** Risk Neutral valuation, Black Scholes option pricing model and assumptions, Interpretation of Black Scholes model.	2	0	0
8	**Option Trading Strategies** Straddle, Strangle, Butterfly, Bull and Bear spread, Ratio spread, Box spread, Condor, Synthesizing with options **Chapter 12**	2	0	0
9	**Exotic Options** Introduction (definitions, payoff and applications) to Forward Start option, Digital Option, Chooser Option, Barrier option, Shout option, Asian option, Compound option **Chapter 13**	2	0	0
10	**Option Greeks (Option Sensitivities)** Delta, Theta, Gamma, Delta Hedging **Chapter 11**	2	0	0
11	**Swaps** Forward Rate Agreement, Currency Swaps, Interest Rate Swaps, Applications of swaps, Cancellation andValuation of Swap **Chapters 6 and 7**	2	0	0
12	**Interest Rate Derivatives (Black's Model and applications)** Caps, Floor, Collars, Swaptions, Options on Bonds, Options on futures, Interest rate futures **Chapter 15**	4	0	0
	TOTAL	28	0	0

Evaluation criteria

- Test 1: Class Participation10%
- Test 2: Project30%
- Test 3: Written Test20%
- Test 4: Written test40%

Learning Outcomes:

On successful completion of the course students will be able to:

1. Recognize the role of derivatives in financial risk management.
2. Demonstrate critical thinking, analytical and problem-solving skills in the context of derivatives pricing and hedging practice.
3. Evaluate alternative risk management strategies and tactics.
4. Demonstrate an understanding of pricing forwards, futures and options contracts.

Pedagogical approach

The course will be delivered through lectures and discussion of case studies, practical in Finance Lab, research papers and articles.

Materials:

Derivatives and Risk Management, By Rajiv Srivastava, Oxford University Press, 2nd Edition

Other references

1. Options, Futures, and Other Derivatives, 7thEdition, By John C Hull, (PearsonEducation)
2. Futures Options andSwaps, By Robert Kolb (Blackwell Publishing)
3. FinancialDerivatives, By Keith Redhead (Prentice Hall of India)
4. Derivatives; AnIntroduction, By Robert A Strong (Thomson South Western)
3. Bhalla, V.K. (2012). *Investment Management.* New Delhi: Sultan Chand.
4. Wimott, P. (2012). *Quantitative Finance.* Wiley & Sons.
5. Jarrow, R. & Stuart, T. (1995). *Derivative Securities.* South Western.
6. Chance, D.M.,& Brooks, R. (2008). *Derivatives and Risk Management Basics.* Cengage Learning India.
7. Pliska, S. (1997). *Introduction to Mathematical Finance.* Wiley-Blackwell Publishing.
8. www.ncdex.com for details on commodity derivatives in India
9. www.nse-india.com for stock-based derivatives
10. http://www.theponytail.net/DOL/DOL.htm for derivatives-based notes

Additional information (if any)

Modules

Sessions plan as above would be followed with following module objectives:

An overview of risk and derivatives:

The objective of the session is to draw distinction between various kinds of risks that a firm is exposed to. Some of these risks are manageable with derivative instrument. The session on Introduction to derivatives is intended to provide an overview of derivatives, their characteristics and misconceptions about them.

Forwards and Futures:

These sessions are aimed at introducing the terminology of forwards and futures, their applications of hedging fro variety of underlying assets such as commodities, currencies, stocks and interest rates. This would also cover the pricing principles and methods of trading, settlement etc. Separate sessions for commodities, currencies and stock indices would deal extensively with the examples of hedging, speculation and arbitrage.

Options:

Sessions on options are aimed at developing an understanding about the complex nature of the derivative. The objective is to familiarize the participants with the various ways to value options. Hedging using options would be discussed in details with suitable real life applications. Trading strategies with options would deliberate upon how the combination of options can be used to achieve the desired risk profiles of different classes of investors. Sessions on exotic options would concentrate on how the parameters of options can be modified to suit the individual needs of

hedging and cost associated with them. *Swaps and Interest Rate Derivatives:* These sessions are useful for the sectors such as banking, construction and infrastructure that are sensitive to broad economic factors and interest rate structures and changes in them. The tools of managing the interest rate risk would be introduced with emphasis on swaps and interest rate futures.
Student responsibilities All students are expected to read the assigned readings prior to the class. Students are expected to analyze the case following the 'discussion questions'. All students must maintain full attendance and do timely submission of assignments. Full Class Participation is expected from all students.

Prepared by:

CourseReviewer:

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