BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus
AUGS/ AGSR Division

SECOND SEMESTER 2020-21
COURSE HANDOUT

Date: 20.01.2021

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 : **BITS F449/ ECON F413**
Course Title : **FINANCIAL ENGINEERING**
Instructor-in-Charge : **ARUN KUMAR VAISH**
Instructor(s) : **ARUN KUMAR VAISH**
Tutorial/Practical Instructors: NA

1. Course Description:

The Financial Engineering Concentration encompasses the design, analysis, and construction of financial contracts to meet the needs of enterprises. It involves the development and creative application of financial theory and financial instruments to structure solutions to complex financial problems and to exploit financial opportunities.

2. Scope and Objective of the Course:

The objective of the course is to provide knowledge about preliminary understanding of financial engineering tools and techniques in the present market environment such as applications of Future & Options for hedging, asset price dynamics and use of simulation in decision making. Financial Engineering is a multidisciplinary field involving financial theory, the methods of engineering, the tools of mathematics and the practice of programming. The course on financial engineering would enables students to respond to the professional requirements particularly related to investment banking, financial management, treasury operations, asset management, risk management, consulting and capital markets etc.

3. Text Books:

T1. Salih N. Neftci, Principles of Financial Engineering, Academic Press Publishers, 2009

4. Reference Books:

R1. David A. Dubrofsky and Thomos W. Miller, Jr., Deivatives Valuation and Risk Management, Oxford Unversity Press.

R2. David G. Luenberger, Investment Science, Oxford University Press

R3. Futures, Options and Other Derivatives by John C Hull, 8th Edition, Prentice Hall

R4. Derivatives Principles and Practice by Rangarajan K. Sundaram and Sanjiv R. Das, McGraw Hill Education (India) Private Limited, New Delhi

5. Course Plan:

Module No.	Lecture Session	Reference	Learning outcomes
1	1	Chap 1+ Class notes	Understanding the concept of financial engineering, its tools and techniques etc.
2	2-3	Chap 2 of T1 +class notes	Understanding financial players and markets and instruments and related conventions.
3	4-6	Class notes	To know about the fixed income securities.
4	7-9	Class notes+ Chap3 & 4 of T1 + R3	Understanding the concepts of derivatives. Determination of Forwards and Futures prices,
5	10-13	Chap 5 & 13 of T1+R1+ R3 + class notes	Understanding the concepts of swaps and their different types and uses.
6	14-17	Chap 9 of T1+ class notes	Learning convexity of bond and yield volatility.
7	18-20	R3 + class notes	To know about the Wiener process and Ito's Lemma
8	21-29	Chap 8&10 of T1, + R3 plus class notes	Understanding the concepts of Options Pricing, Option mechanics, options engineering and its application.
9	30-33	Chap 13-15 of T1 + R3+ class notes	UnderstandingVolatility swaps, Smiles and volatility trading.
10	34-38	R3 + class notes	Estimating volatilities and correlations
11	39-42	Chapter 11&12	UnderstandingV-a-R, Learning Tools of financial engineering in pricing and application of fundamental theorems

6. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of component (Close Book/ Open Book)
Mid-Semester Test	90 Min.	30		OB
Comprehensive Examination	2 h	30		OB
Surprise Quizzes 2 Best Out Of 3 (One Buffer, No Makeup)	20 mins each	30		OB
Study of Selected research articles and presentations thereof		10		OB

7. Chamber Consultation Hour: 11 AM -Thursday

8. Notices: All notices will be displayed on Department of Management Notice Board

9. Make-up Policy: Make-up will be given only on genuine cases and on prior approval.

10. Note (if any):

Instructor-in-charge

Course No. BITS F449/ ECON F413