

**UNIVERSITY OF NORTHERN BRITISH COLUMBIA
BUSINESS PROGRAM**

**COMM 423
Financial Engineering
Fall 2016**

Professor: Jing Chen	Telephone: 960-6480
Office: 10-4534, T&L	Class Time: M 2:30 – 5:20
Office Hours: T 11:30 – 1:20 (or by appoint.)	Class Location: 10-4588
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COURSE OBJECTIVES

The powerful impacts of financial derivatives in this financial crisis have become widely known. This reflects the great flexibility of financial engineering in designing financial instruments that exploit the existing regulatory framework to its fullest extent. In this course, we will show that the techniques developed in financial engineering can be applied in much broader fields. The theory of financial engineering provides a unified description of many social and biological problems.

Traditionally, most practitioners in the field of financial engineering are from the graduates of natural sciences. Indeed, Fischer Black, the main founder of the theory of financial engineering, was a math graduate. This course provides a great opportunity for students with strong quantitative background and inquisitive mind to explore the crown achievement of finance and apply the methodology to their own fields.

PREREQUISITES for this course are COMM 320, COMM 321 or its equivalent

TEXTBOOK AND NOTES

Recommended textbook: *The Unity of Science and Economics: A New Foundation of Economic Theory*, (2016), Springer by Jing Chen

Notes will be distributed in classes.

COURSE EVALUATION

Mid-term	25%
Final Exam	40%
Project and presentation	25%
Class Participation	10%
Total	100%

In a **Group Project**, it is required to apply the investment theory developed in the course to a broad range of problems.

Class participation will be based upon the quality of contribution to class discussions. It is mainly based on the number of times one does homework on the whiteboard in the classes.

TENTATIVE COURSE OUTLINE:

Week	Dates	Topic	Notes
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1	Sept 12	<u>Introduction and outline</u>	
2	Sept 19	<u>Mechanics of options market</u>	<u>Derivative Securities: What They Tell Us?</u>
3	Sept 26	<u>Behaviour of stock prices</u>	Stochastic Calculus
4	Oct 3	<u>The Black-Scholes model</u>	<u>Option calculation Excel sheet, Probability Distribution Table, Excel solution for homework</u>
6	Oct 17	<u>Theory of Investment ; Exercises Excel</u> <u>Figures Excel</u>	<u>Homework, Excel solution</u>
7	Oct 24	Midterm	<u>Project discussion</u>
8	Oct 31	<u>Monetary Theory and Business Cycles</u>	<u>Homework, Excel solution</u>
9	Nov 7	<u>Relations among parameters</u>	
10	Nov 14	<u>Theory of capital structure, Life cycle in financing</u>	<u>Homework, Excel solution , Discussion on project</u>
11	Nov 21	Presentation of projects	
12	Nov 28	Review	
13	TBA	Final exam	

Please note that the above course outline is tentative. Although the major topic areas will be covered, the detail and extent of coverage will depend on the pace at which the class progresses.

Financial calculator is required in the classroom. A programmable calculator is preferred to handle complex calculation.