Columbia – NUS

Double Professional Degree
in Financial Engineering

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What is Financial Engineering?

- **A cross-disciplinary based on**
  - **mathematical finance**
  - **numerical methods**
  - **computer simulation**
- **To make:**
  - **Trading, hedging and investment decisions**
- **And to:**
  - **Facilitating the risk management of those decisions**

Financial Engineering at Columbia University

- **One of the first program to offer an MS degree in Financial Engineering**
- **Over 800 applications per year from top institutions all over the world:**
  - **Great students from China, France, India**
- **Selectivity 12.5%**
- **Yield 80%**
- **Placement**
  - **Most students get multiple job offers**
  - **High compensations packages**
- **Increase interest in FE from our Ph.D. students**

Professional Degree in Financial Engineering

- **Professional Degree is a post-Master level coursework based degree for enhancement of skills in Financial Engineering**

- **Coursework is at the MS-PhD level but the degree does not require a dissertation**

- **Columbia and NUS will be offering the World's first Professional Degree in Financial Engineering program.**

Double PD Degree in Financial Engineering

Graduates of the D-PD program will earn:

- **Professional Degree in Financial Engineering from Columbia University**

- **Professional Degree in Financial Engineering from National University of Singapore**

Program Background

- **Demand from industry for professionals with training beyond the MS level**
- **Professional Degree in Industrial Engineering has existed at Columbia for many years**
  - **Demand for this degree comes primarily from distance learning students**
- **Singapore aims to be the financial and educational center of South East Asia**
  - **Professional degree program is of interest and will be partially supported by the Monetary Authority of Singapore (MAS)**

Objective of the Program

Program aims to provide Master graduates with additional training for skills in the following core areas:

- Financial markets and instruments
- Advanced topics in financial engineering
- Quantitative methods such as stochastic modelling, simulation, optimization and statistical tools

Career Opportunities

Graduates of this D-PD program will be trained for:

- **Professions in Investment banking**
- **Commercial banking**
- **Central Banks and Governments**
- **Asset-Liability Management**
- **Risk Management**
- **Primary and Derivatives Securities Valuation**
- **Financial Information Systems Management**
- **Portfolio Management and Securities Trading**

Admission Requirements

Applicants must meet the following requirements:

- A Master degree in Financial Engineering or equivalent from NUS / CU or their equivalent.

- High GRE scores

- Good TOEFL score if English was not the medium of instruction in previous studies

Program Structure

- **Part-time program.**

- **Minimum and maximum period of candidature is two and four years respectively.**

- **Candidates are required to take at least 16 modular credits per year or the equivalent of 12 credits per year at CU.**

Graduation Requirements

- **For CU PDFE, candidates are required to complete 30 credits comprising 6 core courses and 4 elective courses**
  - **Minimum grade of B over the approved candidature period.**
- **For NUS PDFE, candidates are required to complete 6 core courses and 6 elective courses (equivalent to 36 credits at Columbia)**
  - **Minimum Cumulative Average Point (CAP) of 3.0 over the approved candidature period.**

The 6 Common Core Courses

- **NUS-FE6101** **Interest Rate & Credit Risk Modeling**

- **NUS-FE6102** **Advanced Econometrics for Risk Management**

- **CU-IEOR6810** **Advanced Stochastic Models in Financial Engineering I**

- **CU-IEOR6811** **Advanced Stochastic Models in Financial Engineering II**

- **CU-IEOR6820** **Computational Finance**

- **CU-IEOR6830** **Empirical & Statistical Issues in Financial Engineering**

Elective Courses from Columbia

- **CU-IEOR E4709   Data Analysis for Financial Engineering**
- **CU-IEOR E4403   Advanced Engineering and Corporate Economics**
- **CU-IEOR E4500   Applications Programming for Financial Engineering**
- **CU-IEOR E4601   Dynamic Pricing and Revenue Management**
- **CU-IEOR E4602   Quantitative Risk Management**
- **CU-IEOR E4708   Seminar on Important Ideas in Financial Engineering**
- **CU-IEOR E4710   Term Structure Models**
- **CU-IEOR E4718   Introduction to the Volatility Smile**
- **CU-IEOR E4731   Credit Risk and Credit Derivatives**
- **CU-IEOR E4724   Hedge Fund Management**
- **CU-IEOR E4725   Numerical Solutions of Partial Differential Equations**
- **CU-IEOR E4726   Experimental Finance**
- **CU-IEOR E4727   Quantitative Portfolio Management**

Elective Modules from NUS

- **NUS-BFA6002 Finance Theory**
- **NUS-BFA6004 Empirical Finance**
- **NUS-RE6005 Real Estate Economics Research Seminar**
- **NUS-RE6006 Real Estate Finance Seminar**
- **NUS-FE5204 Stochastic Calculus and Processes**
- **NUS-CS5228 Knowledge Discovery in Databases**
- **NUS-CS5264 Decision Making Technologies**
- **Additional electives are available depending on semester**

Sample Program Structure

Courses		Credits
NUS-FE6101	Interest Rate & Credit Risk Modeling	3
NUS-FE6102	Advanced Econometrics for Risk Management	3
CU-IEOR6810	Advanced Stochastic Models in FE I	3
CU-IEOR6811	Advanced Stochastic Models in FE II	3
CU-IEOR6820	Computational Finance	3
CU-IEOR6830	Empirical & Statistical Issues in Financial Engineering	3
Elective 1	from NUS	3
Elective 2	from NUS	3
Elective 3	from CU	3
Elective 4	from CU	3
Elective 5	from CU	3
Elective 6	from CU	3

Delivery Modes

- **Students from Singapore may come to US and take courses**
- **Students may take up to four courses through distance learning**
  - **Columbia Video Network**
    - **Rated "Best of the Web" by Forbes Magazine**
  - **NUS has world class distance learning facilities**
- **Columbia will offer**
  - **Teach two or three courses per year in Singapore**

Research Component

- **Program has incentives for faculty to collaborate in research with**

  - **Professors and students at NUS**
  - **Professionals at the Monetary Authority of Singapore**
  - **International Banks**