

## Graduation Requirements for Master of Finance Engineering

### Thesis Degree

- Total Required Credit: 54 Credits
  
- Mandatory General Courses: 3 credits and 1AU
  - CC020 Ethics and Safety (1AU)
  - CC511 Probability and Statistics (3)
  - [Substitute: MGT503 Management Statistical Analysis (3) ]
  
- Mandatory Major Courses: 16.5credits
  - More than 3 credits must be taken among listed below courses
    - FE501 Stochastic Calculus for Finance (1.5), FE511 Applications in Stochastic Calculus for Finance (1.5), FE539 Computational Finance (3)
  - FE503 Fundamentals of Investment and Asset Pricing (1.5)
    - [Substitute: BA631 Theory of Finance I (3) ]
  - FE504 Analysis of Fixed Income Securities (1.5)
  - FE505 Derivatives
  - FE506 Financial Accounting(1.5)
    - [Substitute: FMB502 Financial Accounting (3) ]
  - FE507 Financial Statement Analysis (1.5)
  - More than 3 credits must be taken among listed below courses
    - FE508 Computer Programming for Financial Engineering I (1.5),
    - FE510 Computer Programming for Financial Engineering II (1.5),
    - FE538 Computer Programming for Financial Engineering III(3)
  - FE639 Research Methods in Financial Engineering I (1.5)
  - FE649 Research Methods in Financial Engineering II (1.5)
  - ※ The mandatory courses can be waived up to 9 credits with a permission of instructor and with an approval of the chair professor. Students exempted from taking mandatory courses must replace the waived credits with electives.
  
- Elective Courses: 25.5 Credits or more
  - ※ The chair professor reviews courses taken from global study programs or dual degree programs to apply them to modules respectively and they are counted as elective credits. Maximum of 18 credits can be transferred to KAIST.

○ Concentration(Optional)

Students can choose two of the following concentrations depending on their interests and select electives satisfying what the concentrations require. Students are required to report which concentration they wish to complete and request for a concentration certification during their last semester (early April or November).

1) Concentration in Derivatives

This concentration requires minimum of 12 credits from below courses

FE509 Estimation of Financial Engineering Models (1.5)  
FE515 Advanced Derivatives (1.5)  
FE520 Financial Security Design (1.5)  
FE521 Simulation Methods for Finance (1.5)  
FE522 Advanced Econometric Analysis for Finance (1.5)  
FE524 Interest Rate Derivatives (1.5)  
FE525 Management of Derivative Positions (1.5)  
FE531 Numerical Methods in Finance (1.5)  
FE532 Financial Time Series Analysis (1.5)  
FE534 Credit Risk Modeling and Credit Derivatives (1.5)  
FE535 Derivative Trading Strategies (1.5)  
FE542 Advanced Financial Time Series Analysis (1.5)  
FE545 Contemporary Topics in Derivatives (1.5)  
FE619 Distinguished Lectures in Financial Engineering(1.5)

2) Concentration in Quantitative Asset Management

This concentration requires minimum of 12 credits from below courses

FE513 Portfolio Optimization and Management(1.5)  
FE517 Analysis of Economic Indicators and Forecasting(1.5)  
FE523 Real Estate Investments (1.5)  
FE527 Security Analysis and Trading Strategies (1.5)  
FE537 Statistical Arbitrage(1.5)  
FE547 Algorithmic Trading and Quantitative Trading(1.5)  
FE553 Alternative Investment(1.5)  
FE554 Fixed Income Portfolio Management (1.5)  
FE563 Investments in Venture(1.5)  
FE573 Investments in Private Markets(1.5)  
FE583 Foreign Currency Investment(1.5)  
FE587 Estimation of Asset Pricing Models(1.5)  
FE617 Distinguished Lectures in Asset Management(1.5)  
FE627 Cases in Asset Management(1.5)

3) Concentration in Fixed Income, Currency and Commodity

This concentration requires minimum of 12 credits from below courses

FE509 Estimation of Financial Engineering Models (1.5)  
FE514 Term Structure of Interest Rates (1.5)  
FE520 Financial Security Design (1.5)  
FE524 Interest Rate Derivatives (1.5)

FE534 Credit Risk Modeling and Credit Derivatives (1.5)  
FE537 Statistical Arbitrage(1.5)  
FE544 Mortgage Backed Securities & Other Structured Securities(1.5)  
FE547 Algorithmic Trading and Quantitative Trading (1.5)  
FE554 Fixed Income Portfolio Management (1.5)  
FE557 Commodity Trading (1.5)  
FE583 Foreign Currency Investment (1.5)  
FMB613 International Finance (1.5)  
FMB688 Foreign Exchange Markets and Foreign Exchange Policy (1.5)

#### 4) Concentration in Risk Management

This concentration requires minimum of 12 credits from below courses

FE513 Portfolio Optimization and Management(1.5)  
FE515 Advanced Derivatives (1.5)  
FE518 Principles of Insurance and Risk (1.5)  
FE520 Financial Security Design (1.5)  
FE521 Simulation Methods for Finance (1.5)  
FE522 Advanced Econometric Analysis for Finance (1.5)  
FE528 Financial Market Risk Management (1.5)  
FE532 Financial Time Series Analysis (1.5)  
FE534 Credit Risk Modeling and Credit Derivatives (1.5)  
FE541 Mathematics for Insurance (1.5)  
FE542 Advanced Financial Time Series Analysis (1.5)  
FE544 Mortgage Backed Securities & Other Structured Securities(1.5)  
FE553 Alternative Investment (1.5)  
FE628 Cases in Risk Management(1.5)

#### 5) Concentration in Financial Analytics

This concentration requires minimum of 12 credits from below courses

FE513 Portfolio Optimization and Management(1.5)  
FE521 Simulation Methods for Finance (1.5)  
FE526 Operational Risk Management (1.5)  
FE531 Numerical Methods in Finance (1.5)  
FE532 Financial Time Series Analysis (1.5)  
FE534 Credit Risk Modeling and Credit Derivatives (1.5)  
FE540 Artificial Intelligence and Machine Learning for Financial  
Engineering (3)  
FE542 Advanced Financial Time Series Analysis (1.5)  
FE543 Financial Market Microstructure (1.5)  
FE547 Algorithmic Trading and Quantitative Trading (1.5)  
FE564 Introduction to FinTech (1.5)  
FE565 Financial Information and Security Design (1.5)  
FE566 Cross-Sectional Financial Data Analysis (1.5)

FE567 Financial Data Analysis with Big Data (1.5)

FE568 Big Data Analysis on Credit Risks (1.5)

6) Concentration in Green Finance

This track requires minimum of 9 credits from below courses offered by Graduate School of Green Growth in which 1 course from below list should be included in addition to taking GG951 Green Project (3) as a mandatory.

GG501 Introduction to Green Business (3)

GG510 Green Technologies and Green Industries (3)

GG604 Studies on Green Growth Strategy (3)

E. English Proficiency Requirement

- ① Students are required to complete two BUS900 level English courses. This requirement is waived for students who have obtained S Level of Oral Proficiency Interview (OPI).

F. Research : Thesis Research 9 credits

G. Application

- ① This curriculum applies to students from the year 2020 and after.
- ② Students who have entered before 2019 spring semester apply to this curriculum upon receiving approval from the chair professor.

H. Interim measures

- ① Students who have entered in 2016 spring may apply to equivalent track(s) upon receiving approval from the chair professor, when they complete Concentration in Derivatives, Quantitative Asset Management, Fixed Income, Currency and Commodity, Risk Management and Financial Analytics.
- ② For 2016 Fall entrance and before,
  - FE508 Financial Engineering Programming I (1.5) can replace FE529 Financial Engineering Programming I (1) upon completion.
  - FMB510 Financial Engineering Programming II (1.5) can replace FMB530 Financial Engineering Programming II (0.5) upon completion.
- ③ For 2019 spring entrance and before,
  - MGT503 Management Statistical Analysis(3) can replace CC511 Probability and Statistics (3) upon completion.