Master in Financial Engineering

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Roadmap

1. What is Financial Engineering?

2. Career choices

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1. What is Financial Engineering?

Financial engineering is the application of mathematical methods to the solution of problems in the field of finance such as:

- Portfolio allocation
- Risk measurement and management
- Risk hedging
- Financial decisions

- Financial engineering draws on applied mathematics, probability, statistics, and computer science and combines them with economic theory.
2. Career choices

The need for well-trained financial engineers and financial data experts has surged in all areas of finance.

- **Portfolio management**: identify management objectives and translate them into strategy, taking uncertainty into account.

  (investment banks, hedge funds, pension funds, insurance companies, etc.)

- **Risk management and control**: definition and implementation of rules to measure and control risk

  (all companies - not just financial - and regulatory agencies)
Career choices

- **Corporate finance**: financing a company's activities (all companies, including financial)

- **Asset trading**: buying and selling assets (banking, hedge funds, insurance)

- **Development**: development and marketing of new products and/or markets (banks, foreign exchange, consulting firms)

- **Research**: academic - SFI@EPFL doctoral program or elsewhere (financial companies, regulatory agencies, public institutions)
Recent graduates

- Cargill: Commodity Trader
- Goldman Sachs: Quant
- McKinsey & Company: Consultant
- Deloitte: Quantitative Analyst Consultant
- Nestle: Investment Analyst
- UBS: Quantitative Financial Analyst
- PwC: Associate
- Covario: Quant
- Unigestion: Portfolio Analyst
- Total: Oil derivatives Analyst
- Unit8: Data engineer
- Citibank: Risk Model Developer
- Evoq: Quantitative Analyst
- Princeton University: Ph.D Financial Mathematics
- Lombard Odier: Risk Manager

Section of Financial Engineering
3. MFE Program structure 24-25

- Specialized master program
  - Three semesters of coursework (75%)
  - 6 months internship in industry and master thesis (25%)

- Will lead to accredited engineer title

- Courses are entirely taught in English

- No out mobility or minor
Block of mandatory fundamental courses

Accounting for finance, introduction to finance, optimization, econometrics, probability & stochastic calculus + SHS

Block of mandatory advanced courses

Derivatives, advanced derivatives, ethical behavior in the financial industry, macroeconomics, interest rate & credit risk models, investments, machine learning in finance, quantitative risk management

Group electives

Mandatory fundamental courses 33 ECTS

Mandatory advanced courses 34 ECTS

Electives 23 ECTS
**Project Master in Industry**

Students acquire industry experience & knowledge in conducting a larger project (master thesis)

- Specific content depending on host firm & thesis topic

**Examples of master projects:**

- Internal control systems failures: analysis and suggestions
- Refined View on Balance Sheet Stress Testing
- Explainable Machine Learning for Asset Allocation
- Valuation and Optimization in Transitioning Electricity Markets
- Estimating and forecasting the tails of non-normal distributions
4. Admission Conditions

- Online application (from mid-November to December 15\textsuperscript{th} or from December 16\textsuperscript{th} to March 31\textsuperscript{st})

- Minimum average grade of 4.5 over the entire Bachelor’s

- Necessary but not sufficient condition: the motivation will also be assessed!

- The MTE master is an engineering degree
Contact

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Frequently Asked Questions

- **Difference with other programs?**
  - UNIL: Larger classes (no selection), less technical, not designed for students without background in economics/finance
  - ETH/UNIZ: Shorter program with only 60ECTS of courses and no internship. Also slightly less technical

- **Placement?** almost all (>92%) students find jobs within six month of graduation

- Want to talk to our students: [www.fes.epfl.ch](http://www.fes.epfl.ch)
4. Questions

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