ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

UYGULAMALI MATEMATİK ENSTİTÜSÜ
INSTITUTE OF APPLIED MATHEMATICS

FINANCIAL MATHEMATICS PROGRAM

Why Applied Mathematics?

Mathematics is creative, exciting and is the future. Without mathematics, modern key technologies would be unimaginable.

Institute of Applied Mathematics (IAM) was established in 2002 at METU to educate graduates from various disciplines with the objective of developing and applying their skills for solving real life problems in science, engineering, finance and industry.

About 50 scientists from different fields contribute to teaching and research at IAM and 277 students graduated since 2004, among them 45 with Ph.D. degrees.

Why Study Financial Mathematics?

Financial Mathematician as a profession has consistently been rated one of the top jobs in many countries. Financial Mathematicians are always in demand as long as financial decision making is crucial. They participate in high-level business decision-making in every industry and are the back bones for companies in financial sector.

Importance of Financial Mathematics in Turkey

Financial Mathematics develops an understanding of the fundamental probability tools for quantitatively modeling the financial tools and demonstrates an ability to apply these tools to problems encountered in finance.

Turkey has encountered a risky financial environment due to its growing economy with abridging west and east economies which makes the country a financial hub in the Middle East.

Economic growth forces Turkey to improve its financial markets to develop present financial instruments. This requires the need of broad analysis of financial markets and instruments, and to have well-educated analysts to deal with modelling and development of strategies.

Why Financial Mathematics in METU?

METU was ranked in the top 80 among the world's most reputable 100 universities in the last three years according to "The Times Higher Education World Reputation Rankings".

METU was also ranked among the Top Universities in the World in 9 subjects according to Quacquarelli Symonds (QS) of UK. Mathematics, Statistics-Operations Research, Economics-Econometrics, Computer Science and Information Systems are the subjects in the top 200 university list in 2014, which are the interdisciplinary research areas of the IAM.

The academic staff of METU includes knowledgeable and valuable academicians who are experts in interdisciplinary teaching and research. The language of education is English.

A total number of 97 students have graduated with Ph.D. and M.Sc. degrees in Financial Mathematics Program since 2004.

Objectives of Financial Mathematics Program

Better understanding of financial dynamics to derive and extend the mathematical or numerical models.

Assessment and modelling of financial risk, credit risk, operational risk and actuarial risk to analyze and evaluate financial assets are some of the unique abilities financial mathematics bestow.

The students are educated to gain ability to identify, quantify, assess and manage the risk uncertainty for real life problems using financial tools.

Empirical research with strong mathematical background, practical applications of advance mathematics, finance, risk management and risk analysis to contribute to the advancement of financial mathematics.

Suitable for Students from all Disciplines

The program is suitable for all students having degree from Faculty of Sciences, Faculty of Economics and Administrative Sciences and Faculty of Engineering.

Financial Mathematics is a multidisciplinary program providing a balanced training in the financial and advanced mathematical analysis.

It focuses on mathematical model-building in the various specialized fields of finance: exchange, energy market, future and forward market, derivatives market, financial risks, hedging strategies.

A Financial Mathematics degree makes you compatible in Mathematics, Statistics, Economics, Finance and as well as in other subjects.

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Structure of the Graduate Program

The program offers an M.Sc. Degree with thesis and non-thesis options and a Ph.D. Degree. Students having insufficient background are required to take deficiency courses.

M.Sc. Core Courses

IAM 520 Financial Derivatives
IAM 521 Financial Management
IAM 522 Stochastic Calculus for Finance
IAM 524 Financial Economics
IAM 526 Time Series Applied to Finance
IAM 530 Elements of Probability and Statistics /
IAM 556 Simulation

Ph.D. Core Courses

IAM 614 Methods of Computational Finance
IAM 615 Advance Stochastic Calculus for Finance
BA 6801 Theory of Finance

Selected Elective Courses*

IAM 525 Game Theory
IAM 528 Markov Decision Processes
IAM 542 Stochastic Processes
IAM 543 Regulation and Supervision of Financial Risks
IAM 550 Portfolio Optimization
IAM 544 Financial Risk Assessment with MATLAB
IAM 554 Interest Rate Models
IAM 557 Statistical Learning and Simulation

*Students are encouraged to take elective courses from Economics, Business Administration, Statistics, and Industrial Engineering departments.
http://iam.metu.edu.tr/courses

Collaboration and Student Exchange

Academic collaborations with

- National and international institutions such as Koç University, Boğaziçi University, Ulm University,
- Technical University Kaiserslautern, University of Oslo.
- Erasmus Exchange Agreements.
- Public and Private sectors such as Republic of Turkey,
- Central Bank, Republic of Turkey, Prime Ministry,
- Undersecretariat of Treasury, Ministry of Development,
- Banking Regulation and Supervision Agency
  Membership to SIAM (http://siam.metu.edu.tr/), EURO (http://europt.iam.metu.edu.tr/) an international organization in Operations Research and Optimization.

Scientific projects have been done with the collaboration to other academic institutions.

Conferences Organized

- The Mathematical Tool Box for the Financial Engineering (Ankara, Turkey, 2005)
- Workshop in Memory of Professor Hayri Körezlioğlu (Ankara, Turkey, 2008)
- ICACM - International Conference on Applied and Computational Mathematics, 2012
- 13th International Congress on Insurance: Mathematics and Economics (IME2009) (Istanbul, Turkey, 2009)
- Workshop on Recent Developments in Applied Probability and Statistics Dedicated to the memory of Professor Jürgen Lehn, (Ankara, Turkey, 2009)
- Monte Carlo Methods in Finance: Basic Methods and Recent Advances, (Ankara, Turkey 2013)

Student Support

- Assistantship and part-time student assistantship opportunity (requires Turkish citizenship)
- Turkish Scientific Research Council (TÜBİTAK) Scholarship
- Assistantship in TÜBİTAK Research Projects Techno - Thesis: Joint Thesis Project with METU Techno Park
- 50% Higher Education Council (YÖK) Scholarship with the deduction tuition fee for foreign students being successful in the program.

Job Opportunuties

Financial Mathematics is highly desirable in management positions because of their multidisciplinary background and strong quantitative emphasis. Job opportunities both in public and private sectors are;

- Central Bank of the Republic of Turkey (TCMB)
- Banking Regulation and Supervision Agency (BDDK)
- Private Banks
- Republic of Turkey Energy Market Regulatory Authority (EPDK)
- The Scientific and Technological Research Council of Turkey (TÜBİTAK)
- Turkish Statistical Institution (TUİK)
- Minister of Health of the Republic of Turkey
- Borsa Istanbul
- ASELSAN

Admission Requirements and Application

The selection process requires documentation of the followings:

- METU-EPE (English Proficiency Exam) ≥ 65 or TOEFL-IBT ≥ 79
- ALES ≥ 75 or GRE-Quantitative Score ≥ 713
- At least 2 reference letters
- Letter of intention

Application Deadline to program: June 20, 2014
Application Deadline to EPE: June 10, 2014
Applicants will be interviewed when necessary
For application deadline and more information:
http://iam.metu.edu.tr/universitys-application-page