



## Master of Science in Natural Sciences – **Financial and Actuarial Mathematics**

This Master's program prepares specialists in quantitative methods of risk assessment and hedging for the financial sector, banking and insurance companies. The program provides knowledge and skills in two major areas - mathematics of derivative pricing and actuarial (insurance) mathematics. Sound knowledge and interest in mathematics are advantageous for success in this Master's program.

### Who can benefit from this degree

- graduates with a Bachelor's degree in Mathematics, Statistics, Economics, or Physics
- young professionals already working at financial institutions, both in the private and public sector

### How will this degree develop your potential

The program places a special emphasis on applied mathematical models and quantitative methods, meets EU educational standards in actuarial mathematics, and is the only program of its kind in the Baltic Region. Our graduates are very competitive on the national and international job markets.

The program provides graduates with the knowledge, practical skills and competence needed to succeed in careers at banks, insurance companies, consulting, financial utilities and financial supervisory authorities.

### Why choose the University of Tartu for your Master's

The Institute of Mathematical Statistics at the University of Tartu has considerable international experience in both training and research, starting with the EU Tempus project "Training of Specialists in Mathematical Models for the Market Economy".

A significant number of graduates of Financial Mathematics continue with doctoral studies at the world's leading universities.

The University of Tartu is the only Baltic university member of the Coimbra Group, uniting reputable European research universities of long-standing traditions.

Tartu is a unique university town with intellectual atmosphere, rich history and student traditions. It is a great place to study and live.

Actuarial Mathematics

## Admission requirements

- Applicants must have 240 ECTS earned prior to their application to this program. Graduates with Mathematics, Statistics, Economics or Physics degrees are candidates well-suited for the program.
- Applicants with a 3-year Bachelor's degree (180 ECTS) must complete one more year (60 ECTS) of university studies elsewhere before applying to this Master's program.
- Proof of English proficiency: TOEFL (min of 550, or 213 computer based), British Council IELTS (6.5), Cambridge Certificate of Proficiency in English (C), or Cambridge Certificate in Advanced English (B).

## Application process and deadline

Deadline for submitting the application:

**May 1 – applicants outside EU**

**June 1 - EU applicants**

### Application documents:

- completed and signed application form (downloadable from [www.ut.ee/studentoffice](http://www.ut.ee/studentoffice));
- completed and signed application form for recognition of prior learning (downloadable from [www.ut.ee/studentoffice](http://www.ut.ee/studentoffice));
- certified or notarized copy of the diploma and diploma supplement (transcript) in its original language for previously completed studies;
- official certified translation of the diploma and diploma supplement (transcript) into English;
- non-EU applicants: copy of the upper secondary school certificate (with a grade list) and official translation of the upper secondary school certificate (with a grade list) into English (both documents certified);
- official test score of English language proficiency (not applicable for native speakers of English, acceptable see above);
- letter of motivation (in English) describing reasons for applying to the program;
- 2 letters of recommendation from a university professor, lecturer or current employer; recommendation letters must be in original (photocopies are not accepted) and contain contact information (including e-mail address) of the person providing the recommendation;
- copy of personal identification document.

All applicants will receive a confirmation upon receipt of their application and its status. Complete applications will be considered by the Admission Commission and decision regarding admission to the Master's program will be made by June 20.

## Prior learning prerequisites

Applicants must have 240 ECTS earned prior to application to the program. Applicants with a 3-year Bachelor's degree (180 ECTS) must complete one more year of university studies (60 ECTS) elsewhere before they can apply to this Master's program at the University of Tartu.

In both cases eligible applicants must have completed the following in their prior learning period:

### Mathematics

*including Calculus, Measure-Theoretic Probability, Statistics*

**at least 30 ECTS**

### Economics

*including Corporate Finance, Investments and Derivatives, Microeconomics*

**at least 15 ECTS**

### Computer Science

**at least 9 ECTS**



## Program structure

During studies at the University of Tartu students earn 60 ECTS: a compulsory courses module (30 ECTS) and Master thesis (30 ECTS). By the end of the program students have a total of 300 ECTS, and receive a degree of Master of Science in Natural Sciences in Financial and Actuarial Mathematics from the University of Tartu.

## Description of modules

### Compulsory module - 30 ECTS

#### Autumn semester - 18 ECTS

Course code	Course title	ECTS
MTRM.01.024	Models of Financial Mathematics	6
MTMS.02.009	Non-Life Insurance Mathematics	4,5
MTMS.02.011	Life Insurance Mathematics	4,5
MTMS.02.015	Risk Theory	3

#### Spring semester - 12 ECTS

MTRM.02.017	Equations of Mathematical Finance	3
MTMS.02.010	Martingales	3
MTRM.02.016	Numerical Methods for Differential and Integral Equations	6

For a more detailed description of courses with objectives, course work and assessment please go to the Studies Information System on [www.ut.ee/studentoffice](http://www.ut.ee/studentoffice) and search by course code.

### Master thesis - 30 ECTS

The Master thesis is a written project, supervised by a Faculty member, presenting a detailed account of a research problem or a practical problem in the field of financial and actuarial mathematics. The public defense of the Master thesis is the final step of the studies.

## Opportunities for doctoral studies

The Master's in Financial and Actuarial Mathematics program prepares students for professional opportunities or further Ph.D. studies in Mathematical Statistics at the University of Tartu or elsewhere. If accepted for doctoral level studies at the University of Tartu, students will have an opportunity to choose between doctoral programs in Mathematics, Economics or Mathematical Statistics with a specialization in Financial Mathematics.

## Tuition fees

Program fee covers tuition and supervision of thesis preparation. Housing, food, insurance and other living expense are not covered by the program fee.

## Language of instruction

All modules and courses in this Master's program are taught in English. The Master thesis is prepared and defended in English as well.

## Teaching staff

The teaching staff consists of professors highly qualified in the field of Financial Mathematics, who also have done extensive research and have international experience. Some of the lectures in the program will be delivered by visiting international staff.



**Raul Kangro, Ph.D.**  
Associate Professor  
of Financial Math  
Institute of Mathematical  
Statistics



**Kalev Pärna, Ph.D.**  
Professor of Probability Theory  
Institute of Mathematical  
Statistics

# Contact information

#### Admissions:

**International Student Office**  
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#### Program:

**Elvi Ehasalu**  
**Institute of Mathematical Statistics**  
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## Practical information

### Accommodation

Tartu University has 8 modern student dormitories with double and single rooms. Each unit is equipped with a bathroom, kitchen, telephone and Internet connection. A place in a double room starts from 100 EUR a month, not including utilities. For more information about housing please visit [www.kyla.ee](http://www.kyla.ee)

Students bringing family for the period of their studies at the University of Tartu can rent apartments from the private sector. Apartments rent for 200-500 EUR a month.

### Living expenses

Food is relatively inexpensive and Tartu has numerous opportunities for eating out. Students should plan on spending 160-200 EUR a month per person on food and basic living expenses in addition to housing costs. More information is available on [www.ut.ee/studentoffice/practical/before](http://www.ut.ee/studentoffice/practical/before)

### Visas and residence permits

Since studies in the Master's program last for 1 year, students will have to apply for a residence permit for Estonia. Citizens of EU and many other countries may apply for one after their arrival in Tartu.

To verify citizens of which countries need to have a visa to enter Estonia and have to apply for a residence permit prior to their arrival please visit [www.ut.ee/studentoffice/practical/before](http://www.ut.ee/studentoffice/practical/before).

### Medical insurance

Students must have proof of medical coverage for the duration of their stay in Estonia.

EU/EEA citizens are entitled to the same social welfare benefits in Estonia as residents of Estonia. Therefore, students coming from the EU/EEA countries should obtain an EU health insurance card or a substitute certificate of EU health insurance card (form E128) from the social service authorities in their home country before arriving in Estonia.

Students who are not citizens of EU/EEA countries must have a medical insurance contract, which guarantees covering any medical treatment costs for the period of study.



### City of Tartu

Tartu is Estonia's second largest city of about 100 000 people. It is located in the south-east of Estonia. The international airport and sea port of Tallinn are only 2,5 hours away and give easy access to all major cities in Europe and Russia.

Tartu is famous for its intellectual atmosphere and University spirit as one out of every five citizens of Tartu are students and many more work or teach at the University. Tartu is one of the few real University towns in Northern Europe.

Foreign visitors speak of Tartu as a very safe and beautiful city to live in, with plenty of history to explore and social life to enjoy.

To learn more about Tartu and Estonia please visit

- [www.tartu.ee](http://www.tartu.ee)
- [www.visitestonia.com](http://www.visitestonia.com)
- [www.smartestonia.ee](http://www.smartestonia.ee)



## Other Master's degrees for international students from the University of Tartu

**Master of Science in Health Sciences - Health Management**

**Master of Arts in Humanities – Foreign Languages:**

Estonian, English, German, Russian, Scandinavian, Romance languages and literature

**Master of Art in Social Sciences - Baltic Studies**

**Master of Science in Natural Sciences - Biomedicine**

