



TUUCS

TURKU CENTRE *for* COMPUTER SCIENCE

[www.tuucs.fi](http://www.tuucs.fi)

# Advanced study opportunities in Turku, Finland



*Where academic tradition meets the exciting future*

# Welcome to...



## ...a country of early adopters and global trendsetters

Finns are active users and innovators of communication technology. Even most of school children have their own cell phones and among students it is rare to find a person without one.

## ...one of the most innovative country in the world

Global Summary Innovation Index has ranked countries all over the world and Finland has been placed within the innovation leaders group. Freedom to think and encouragement to pursue towards your dreams creates extraordinary dynamics in Finnish society.

## ...a city of technologies for tomorrow

Turku is well-known for biotechnology, medical technology and for active usage of ICT in well-being, culture and education. Furthermore, Turku is the world's leading centre for advanced ship building, hosting new innovative ICT in that segment. The Turku region invests in innovative new business. Both nationally and internationally aimed innovative ICT businesses provide for excellent work opportunities for career prone, active Master's graduates. Turku truly combines one of the oldest European academic traditions dating from 1640's with modern innovations.

## ...the second biggest campus in Finland

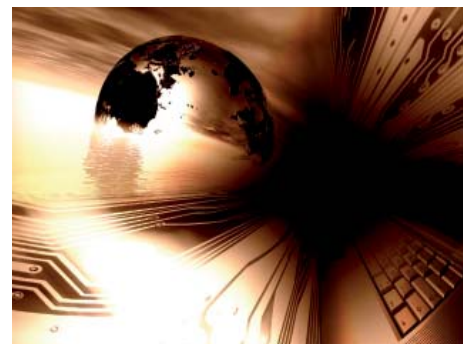
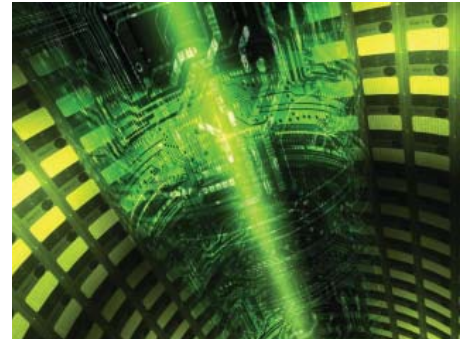
In Finland, the campus area of TUCS has the longest tradition and is the biggest one outside the capital area. This gives Turku a solid foundation for the future technology research and applications. The multidisciplinary campus especially gives you the possibility to be involved with the cutting edge of applied ICT. Turku is the only European style university city in Finland.

## ...six ICT Master's Degree Programmes specialized in cutting edge research

TUCS partner universities offer six Master's Degree Programmes. Each of them is backed up by a local research core competency. The programmes are open to students with a Bachelor's degree or equivalent academic qualifications. They offer an opportunity for students with excellent academic performance to obtain a competitive degree at the highest international standards. TUCS provides excellent opportunities for advanced PhD studies in the Graduate Programme.

## ...coordinator of Nordic Master School in Innovative ICT

NMS iICT ([www.nordicict.eu](http://www.nordicict.eu)) offers opportunities to study leadership and innovation in parallel with technical studies. Use the possibility for green mobility between the major Nordic university cities Copenhagen, Stockholm, Tallinn and Turku.



**TURKU CENTRE *for* COMPUTER SCIENCE**

# Finland

Finland is a Nordic EU Country that lies between Russia in the East and Sweden in the West. Finland's area is 338.000 square kilometres, being the fifth largest country in Europe. The area of Finland is 338,000 square kilometres, of which 8 per cent is cultivated. 10 per cent of the total area is covered by lakes and 69 per cent by forests. The nature is a very important part of daily life of Finns.

The population of Finland is about 5,1 million with an annual growth rate of 0.3 per cent. After Iceland and Norway, Finland is the most sparsely populated country in Europe, with 17 inhabitants per square kilometre. Therefore, the towns are quite small according to the European scale. Most of the inhabitants (76 per cent) live in urban areas. About 56 per cent have completed post-primary education, 43 per cent have a secondary level degree and 13 per cent have a higher level degree.

Finland is a bilingual country, both Finnish and Swedish being the official languages. Around 6 per cent of the population speak Swedish as their native language. Almost everyone in Finland can also speak English, making daily life for foreigners very easy and accessible.

Finland has four distinct seasons. The climate is milder than in many other areas of the same latitude partly because of the warming influence of the Gulf Stream. In the far north of the country the sun does not set for about 73 days, producing the white nights of summer. In winter, on the other hand, the sun remains below the horizon for 51 days in the far north. In summer the temperature quite often rises to +20 Celsius or more and in the winter, temperatures of -20 Celsius are not uncommon in many areas.

Finland is world leading centre for innovations and technologies changing the global business and technologies especially in information technology. Finland has very positive climate for new enterprises and ventures supporting the continuous flow of research originated innovations to global market.



For more information about Finland, please visit: [www.finland.fi](http://www.finland.fi)



For more information about Turku, please visit: [www.turku.fi](http://www.turku.fi)

# Turku

Turku is the oldest city in Finland and was the country's first capital. Known for its cathedral, medieval castle, river and market place, it is now the regional capital of Southwest Finland. The university system and academic traditions were originated in Turku. Turku is the main European style university city in Finland and hosts the 2nd largest amount of students and teachers in Finland. The student life is very vibrant and visible in Turku.

The two official languages of Finland, Finnish and Swedish, are represented in the city with around 5 per cent of the 174,000 inhabitants being Swedish speaking Finns. For advanced studies at master or PhD level the most used study language is English.



In November 2007, the EU Council of Ministers of Culture in Brussels officially named Turku as European Capital of Culture for 2011. The year 2011 provides an unequalled opportunity to introduce Finnish culture and academic traditions in Turku to the world.

Turku/Åbo is a centre for the ICT and BIO technology industries as well as for education. With around 30,000 students, among them around 1,700 international students, it is home to two universities (the University of Turku and the Åbo Akademi University) and several professional advanced training schools.



# Studying in Finland

Finland offers excellent opportunities in higher education in every field of study. Teachers provide their students with ongoing support throughout their studies and they are happy to discuss any problems they may encounter. PhD students are also fully funded through individual or research grants.

Finnish education is highly regarded worldwide. Finland has been regarded to be one of the best places in the world for education with many thousands of students from all over the world coming to study each year in Finland. Not only that, in Finland you are immersed and learn in an environment that has advanced technologies and advanced teaching methodologies.

Finnish are great believers in equal rights for all and this, naturally extends to higher education as well. As a general rule, there are no tuition fees at Finnish universities and polytechnics for students enrolled on regular degree programmes. Although there are no tuition fees at Finnish universities, there is a legal requirement that all university students are members of the Student Union, for which the annual fee is about 100 Euros. Student Union provides many services for students.

The cost of living in Finland is about the same as in other EU countries. Students admitted to a degree programme have to pay for food, accommodation, study materials, clothing, transportation and social activities. The minimum living expenses for a single student amounts to about 600-800 Euros/month depending on cost of accommodation as well as for example health care expenses.

Monthly costs for students are roughly estimated to be:

Accommodation 170-400 EUR  
Lunch at student canteens 40-65 EUR  
Self-catering 85-130 EUR  
Other expenses 85-150 EUR

This estimate does not include social activities, travel or clothing. Expenses during the first month(s) of stay will most likely be higher than in the aforementioned estimation due to rent deposits and other relocation costs.

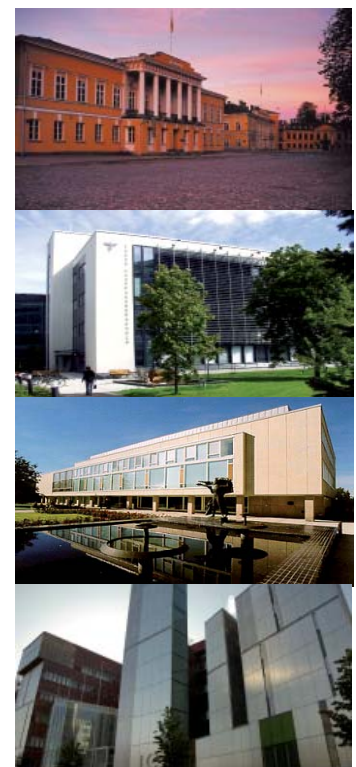


# Studying in Turku

Turku is an idyllic, modern and international city by the Baltic Sea. Long history, friendly people and modern technology all come together in this European Capital of Culture 2011. The academic traditions date back to 1640, when the Royal Academy of Turku was founded. Today Turku hosts a total of two universities: University of Turku and Åbo Akademi University. Turku has a long track of academic excellence in Europe and is currently highly ranked in various ranking lists for universities. Thanks to the universities and other educational institutes, around 20 per cent of the population of 250.000 are students, which creates a youthful and fresh atmosphere. Leading one's life is easy in a compact city. The whole campus area lies within 10 minutes walking distance from the market place – the heart of the city. Prices are generally low and all you need is available.

Turku is well-known for biotechnology, medical technology and for active usage of ICT in well-being, culture and education. Furthermore, Turku is the world's leading centre for advanced ship building, hosting new innovative ICT in that segment. The Turku region invests in innovative new business. Both nationally and internationally aimed iICT businesses provide for excellent work opportunities for career prone, active Master's graduates.

The local innovation centre in Turku is Turku Science Park. Their coordinating force of collaboration in the ICT field is ICT Turku, a cluster focused on information and communications technology and digital content production. The network of ICT Turku is comprised of more than 1,400 Southwest Finnish companies and units of the ICT field. ICT Turku relies on local universities, in joint operation coordinated by TUCS, to provide the cluster with MSc and PhD level professional workforce. Innovation and entrepreneurship aspects both in master and PhD level education are already well and tightly integrated in Turku.



# Coordinator of Nordic Master School in Innovative ICT

Nordic Master School in Innovative ICT (NMS iICT) is a network of the International ICT Master's Degree Programmes at six world-class scientific universities in the Nordic countries: Technical University of Denmark (DTU), Royal Institute of Technology (KTH), Tallinn University of Technology (TTÜ), University of Turku (UTU) and Åbo Akademi University (ÅAU). This Global Innovation Powerhouse offers high expertise in research based iICT education.



## Structure

You study in one of the Master's Degree Programmes at one university, but you can customize your studies with an exchange period at another university of the NMS iICT network. The NMS iICT curricula are linked to the core competence research fields of the universities; by participating in an exchange period you are able to gain the core competencies of more than one university. However, the exchange period is not an obligatory part of the programme, and studying the whole degree at one university provides excellent course selection possibilities as well. Upon graduation, in addition to the Master of Science degree (MSc), you will receive a Nordic Master School iICT certificate from the network.

## Want to turn your vision into venture?

We teach young professionals the necessary innovation and business skills that help them start their careers in the business world straight after graduation or even establish their own companies. An Innovation and Entrepreneurship study module is an obligatory part of the NMS program. This module provides you with skills to work with the business world. Such skills complement the technological expertise you gain during your studies, making you more attractive to business people, as you have learned the basics of their "language" and way of working. Even if you aim at a career in academia rather than in business, these studies are guaranteed to benefit you in the future.

## Why NMS iICT?

The NMS programme certificate is a unique merit that gives you an edge for your future career with the core competence expertise combined with business skills and efficient networking.

The NMS network concept is completely new and does not suffer from the traditional limited view of learning technology just for technology. Instead we teach world-class competence, which will make you capable of applying technical innovations also in business too.

## How to participate in NMS iICT

When you are approved to one of the participating master degree programmes you are also eligible to participate in NMS iICT. You register to NMS iICT during first fall semester in your degree program. For further details contact your programme coordinator.

Requirements for a NMS iICT certificate is a selection of I&E modules. In addition you may use different mobility options within NMS iICT.



## Partner universities

DTU	Technical University of Denmark
KTH	Royal Institute of Technology
UTU	University of Turku
ÅAU	Åbo Akademi University
TTÜ	Tallinn University of Technology

Network coordinator  
TUCS Turku Centre for Computer Science

[www.nordicict.eu](http://www.nordicict.eu)

# Master's Degree Programme in Bioinformatics



Turun yliopisto  
University of Turku

The Master's Degree Programme in Bioinformatics is a programme offering interdisciplinary knowledge of bioinformatics. Education is given in English, and the students in this programme learn to work together with associates from different countries and scientific backgrounds. Applicable fields of prior studies are biosciences and information technology, or other relevant fields where sufficient knowledge of information technology and/or biosciences is achieved for studying in the Master's Degree Programme in Bioinformatics.

The programme covers different aspects of bioinformatics and is managed by two universities in Finland: the University of Tampere and the University of Turku (Department of Information Technology). As an equal cooperation of these participating units, the programme offers fundamental knowledge of :

- Algorithms in Bioinformatics
- Biological Databases and Tools
- Information Retrieval and Extraction
- Data Analysis and Machine Learning Methods
- Sequence Analysis, Protein structures, Phylogenetics
- Proteomics, Functional Genomics, Systems Biology

## Programme outline

The MSc degree is normally attained in two years. All students are introduced to the multidisciplinary field of bioinformatics. The studies encompass different aspects of bioinformatics, computer science, information technology, statistics, mathematics, and biosciences, such as biochemistry, genetics, and molecular biology.

Major subject studies and other studies are arranged as courses, typically 3-5 ECTS credits each. A student attending to a course is expected to participate in classroom work such as lectures and exercises, work on group assignments or individual projects, present a seminar paper, or take an exam, depending on the course. The courses combine different modes of teaching, including distance learning. The study methods vary from course to course and are subject to change. The student is expected to take a majority of the courses in the first year, while the Master's Thesis is a personal scientific research project comprising the core of the second year studies.

## Admission requirements

### *Academic requirements*

A completed university level Bachelor's degree in biological sciences (especially biochemistry or molecular biology) and/or method sciences (computer science, mathematics, statistics) is required for admission.

### *Language requirements*

Applicants to the Master's degree programmes taught in English must always prove their knowledge of the English language.

### *Application period*

The application period starts in the beginning of December and ends in late January for studies starting in September.

For details, please see the admission pages at <http://bioinformatics.utu.fi/>

University of Turku is an internationally acknowledged, multidisciplinary scientific university located on the Southwest coast of Finland, in the vivid city of Turku.

With 21,000 students and 3,000 employees, it is one of the major universities in Finland. Expertise within the University and its seven faculties ranges from humanities to natural sciences.

This programme is offered by the Department of Information Technology at the University of Turku.



**Degree awarded**  
Master of Science

**Duration**  
2 years (120 ECTS)

**Language of instruction**  
English

**Location**  
University of Turku - Turku, Finland  
[www.utu.fi](http://www.utu.fi)

**Programme start**  
September



### Capacity for Innovation

1. Germany
2. Japan
3. Switzerland
4. Sweden
5. Finland
6. United States
7. Denmark
8. France

Source: The Global Information Technology Report 2008-2009



### Contact

Programme Director:  
Tapio Salakoski

Programme Coordinator:  
Eija Nordlund

[bioinformatics@utu.fi](mailto:bioinformatics@utu.fi)

<http://bioinformatics.utu.fi/>

## Course overview

Master's Degree Programme in Bioinformatics (120 ECTS)

### Major subject 40 ECTS

#### *Core courses in bioinformatics*

- Introduction to Bioinformatics (4 ECTS)
- Expression Data Analysis (4 ECTS)
- Bioinformatics in Functional Genomics (4 ECTS)
- Systems Biology I (4 ECTS)
- Phylogenetics (4 ECTS)
- Structural Bioinformatics (4 ECTS)
- Biological Data Analysis Project (4 ECTS)
- Bioinformatics, Programming Course (4 ECTS)
- Algorithms in Bioinformatics (4 ECTS)
- Tools for Intelligent Data Analysis (4 ECTS)

#### *Other recommended courses*

- Advanced Math and CS for Bioinformatics 3 ECTS
- Biological Database Systems 5 ECTS
- Text Mining in the Biomedical Domain 3 ECTS
- Protein Modelling 4 ECTS
- Bioinformatics Project 1-6 ECTS

### Other studies 40 ECTS

#### *Language studies (0-7 ECTS)*

- Finnish for Foreigners (5 ECTS)
- Basic Academic Writing Skills in English (2 ECTS)

#### *Compulsory minor subject studies (0-15 ECTS)*

- Introduction to Molecular Biology (3 ECTS)
- Introduction to Biochemistry (3 ECTS)
- Introduction to Genetics (3 ECTS)
- Introduction to Statistics (3 ECTS)
- Introduction to Programming (6 ECTS)
- Introduction to Computer Science (3 ECTS)
- Math and CS for Bioinformatics (3 ECTS)

#### *Optional studies (18-40 ECTS)*

Optional studies allow focusing on specific topics in bioinformatics and/or provide support in relevant minor subjects. Optional studies can be any additional courses to support your degree. Bioinformatics courses are highly recommended, but you may also choose to build up knowledge of methodological sciences (IT, maths, etc.) or biological sciences.

### Master thesis 40 ECTS

The Master's thesis (pro gradu) consists of a theoretical part based on scientific literature, an experimental or practical part (Master's project), and participation in the Seminar.

## Career prospects

The specific need for bioinformatics professionals will be amongst biological and medical research and development groups in the industrial sector as well as in educational institutions. The Master of Science degree in Bioinformatics gives eligibility for scientific postgraduate studies in bioinformatics, and also in biosciences or in information technology. This kind of multidisciplinary education opens up excellent employment opportunities.

# Master's Degree Programme in Electronic and Mobile Commerce



The Master's Degree Programme in Electronic and Mobile Commerce (EMC) offered by the Department of Information Technologies at Åbo Akademi University is a comprehensive and up-to-date programme with the latest research knowledge in information systems in general, and electronic and mobile commerce in particular.

The studies encompass many aspects of the Information Systems industry and the multifaceted and dynamically growing environment in which it operates. The studies combine subject areas in business economics and management science with mobile services design and e-commerce theory and practise. Students of the programme will acquire knowledge and professional skills in planning, developing, building, and implementing electronic and mobile commerce products and services, and solutions for successful business operations.

The Master's degree programme builds on research at the Institute for Advanced Management Systems Research (IAMSR). IAMSR is a research institute that carries out its research programme in interaction with the Finnish industry. The research programme on mobile commerce and mobile value services has been running since 1999 and now builds on cooperation both with a dozen Finnish companies and a network of research groups at TU Delft in the Netherlands, University of Trento in Italy and City University Hong Kong. An international group of doctoral students works with research projects on mobile value services. When graduating from the EMC programme, the student has both an academic master's degree and experience of building and introducing information systems, a combination that has great demand in multinational corporations worldwide.

A successful completion of this two-year full-time programme results in the award of a Master of Science in Business Administration degree. The programme provides an excellent basis for a management and business career in the modern digital economy.

## Admission requirements

### *Academic requirements*

A completed university level Bachelor's degree in Business Administration or Economic Sciences with Information Systems is required for admission.

### *Language requirements*

The applicants must always prove their knowledge of the English language.

### *Application deadline*

The deadline for applications for studies starting in September is the end of February.

For details, please see the admission pages at [www.abo.fi/master](http://www.abo.fi/master)

Åbo Akademi University was founded in 1918 and is the only Swedish-language multidisciplinary university in Finland.

The university offers both undergraduate and postgraduate studies and extensive research opportunities to some 7,000 students on three campuses: Åbo, Vasa and Jakobstad.

This programme is offered by the Department of Information Technologies at the Åbo Akademi University



**Degree awarded**  
Master of Science (Economics and Business Administration)

**Duration**  
2 years (120 ECTS)

**Language of instruction**  
English

**Location**  
Åbo Akademi University - Turku  
[www.abo.fi](http://www.abo.fi)

**Programme start**  
September



### Availability of scientists and engineers

1. Finland
2. Japan
3. India
4. Sweden
5. France
6. United States
7. Canada
8. Taiwan

Source: The Global Information Technology Report 2008-2009



### Contact

Programme Director:  
Pirkko Walden

Programme Coordinator:  
Eija Karsten

Study Advisor:  
Pia Kallio

mobile-commerce@abo.fi  
www.abo.fi/emc

## Course overview

Master of Science in Economics and Business Administration (120 ECTS)

### Main subject 70 ECTS

Advanced studies in Information Systems (67 ECTS)

#### *Mandatory*

Advanced Seminars in Information Systems (7 ECTS)

Master's thesis in Information Systems (35 ECTS)

#### *Selectable (25 ECTS are chosen)*

Electronic Commerce (5 ECTS)

ICT and the Changes in Work (5 ECTS)

Business Intelligence (5 ECTS)

Data Mining and Text Mining (5 ECTS)

ICT and the Modern Corporation (5 ECTS)

Analytics and Soft Computing (5 ECTS)

Mobile Value Services (5 ECTS)

Project Course (10 ECTS)

Additional studies (3 ECTS)

#### *Mandatory*

Academic Writing Skills for Masters Students (3 ECTS)

### Minor subject 25 ECTS

Basic studies in a minor subject (25 ECTS)

### Mandatory Swedish language course 5 ECTS

Swedish as a foreign language, level 1 (5 ECTS)

### Mandatory course in philosophy 5 ECTS

Philosophy for Business Studies (5 ECTS)

### Free optional studies 15 ECTS

Optional courses in any subject (15 ECTS)

## Master's thesis

The Master's thesis is usually done in cooperation with a number of companies which work on joint projects with the institute for Advanced Management Systems Research.

## Career prospects

The EMC programme provides an excellent basis for a management and business career in the modern digital economy. A graduate from the EMC program typically gets the first employment in a project aimed at adapting the operations of a company to the digital economy and will then be promoted to head development projects and teams in companies building an electronic and mobile commerce business. The next step is typically responsibility for profit centres and strategic business units to be followed by executive positions in the marketing or sales organizations and a position as CEO.

# Master's Degree Programme in Embedded Computing



This two-year programme is designed to prepare its graduates for the challenging design tasks in the Embedded Systems Industry. The programme contains courses given by both Åbo Akademi University and the University of Turku in the areas of Embedded Systems. The programme will be designed and implemented in co-operation with the corresponding programme at University of Turku.

The Master's Degree Programme in Embedded Computing is provided by the Department of Information Technologies at Åbo Akademi University. The study environment benefits from the teaching and research experience gained as part of the Centre for Reliable Software Technology (CREST) - an excellence research centre at the Department of Information Technologies. Its research is focused on the development and analysis of software intensive systems and on the use of software based research paradigms in systems modelling and development. CREST's key competencies are in formal methods for software development, construction of embedded systems, software processes, high performance and energy efficient computing, systems biology, data mining, and CS education.

Since its founding in 2002, CREST has been appointed National Centre of Excellence by the Academy of Finland for the years 2002-2007. CREST has a worldwide network of researchers and industrial companies.

The Department of Information Technologies is located in the Turku Science Park, in the ICT building, where research groups and academic programmes meet, interact and collaborate with ICT companies - many of which are multinational and well known (Nokia, Nokia Siemens Networks, Ericsson, etc.). The study facilities are brand-new and equipped with the latest technology.

Throughout this programme the students will:

- work in a multicultural and multilingual environment
- participate in practical projects with the industry
- get the ability to work in teams
- understand and apply basic notions of project management
- become highly skilled engineers

## Admission requirements

### *Academic requirements*

A completed university level Bachelor's degree in Computer Science or Computer Engineering is required for admission.

### *Language requirements*

Applicants to the Master's degree programmes taught in English must always prove their knowledge of the English language.

### *Application period*

The application period for studies starting in September runs from the beginning of December until late February.

For details, please see the admission pages at [www.abo.fi/master](http://www.abo.fi/master)

Åbo Akademi University was founded in 1918 and is the only Swedish-language multidisciplinary university in Finland.

The university offers both undergraduate and postgraduate studies and extensive research opportunities to some 7,000 students on three campuses: Åbo, Vasa and Jakobstad.

This programme is offered by the Department of Information Technologies at the Åbo Akademi University.



**Degree awarded**  
Master of Science degree in Technology (diplomingenjör)

**Duration**  
2 years (120 ECTS)

**Language of instruction**  
English

**Location**  
Åbo Akademi University - Turku  
[www.abo.fi](http://www.abo.fi)

**Programme start**  
September



### University-industry research collaboration

1. United States
2. Switzerland
3. Sweden
4. Finland
5. Singapore
6. Germany
7. Denmark
8. Belgium

Source: The Global Information Technology Report 2008-2009



### Contact

Programme Director:  
Johan Lilius

Programme Coordinator:  
Sébastien Lafond

Study Advisor:  
Pia Kallio

embeddedcomputing@abo.fi  
www.abo.fi/ec

## Course overview

Master of Science in Technology (120 ECTS)

### Advanced module I 20 ECTS

Advanced module I in Embedded Systems (20 ECTS)

#### *Mandatory*

- Real-Time Systems (5 ECTS)
- Programming Embedded Systems (5 ECTS)
- System Modelling with System C (5 ECTS)
- HDL Based Design (5 ECTS)

### Advanced module II 30 ECTS

Advanced module II in Embedded Systems (30 ECTS)

#### *Mandatory*

- Modelling of Embedded Systems (5 ECTS)
- Design Methods for Embedded Systems (5 ECTS)
- SoC Design (5 ECTS)

#### *Selectable (15 ECTS are chosen)*

- MPEG-4 (4 ECTS)
- Applied Signal Processing, theory (5 ECTS)
- Code Optimization (5 ECTS)
- Multiprocessor Architectures (5 ECTS)
- Reconfigurable Computing (5 ECTS)
- System Verification (5 ECTS)
- Seminar on Computer Systems (5 ECTS)

### Master's thesis 30 ECTS

Master's thesis in Embedded Systems (30 ECTS)

### Minor subject 20 ECTS

Innovation and Entrepreneurship module (20 ECTS)

#### *Mandatory*

- Innovation and entrepreneurship in ICT context (5 ECTS)
- New business models (5 ECTS)
- Business competence and innovations (5 ECTS)
- Innovations and global growth (5 ECTS)

### Mandatory Swedish language course 5 ECTS

Swedish as a foreign language, level 1 (5 ECTS)

### Free optional studies 15 ECTS

Optional courses in any subject (15 ECTS)

## Master's thesis

After completing all the courses, students will do their thesis project either at the department by contributing to the scientific research of the university or in industry under the guidance of local or external advisors. The Master's Thesis accounts for 30 ECTS and should be written in the last year of study, i.e. during the second academic year.

## Career prospects

When graduating the students will have both a good understanding of theoretical issues for starting PhD studies, as well as practical competences for a successful career as an embedded systems engineer in industry. The numerous fields in which embedded systems are applied ensure a wide range of career opportunities in Finland and abroad. Furthermore, the Career Services at Åbo Akademi University can help students enter the labour market and to advise them on issues dealing with job-hunting.

# Master's Degree Programme in Embedded Computing



The goal of the programme is to impart education on embedded system design and modelling. The field is vast covering both hardware and software aspects. A student will obtain a firm foundation to design, model and implement embedded systems. To master the development process, a student will have an understanding of design constraints, hardware/software trade-offs, design methods and software and hardware architectures as well as low-level programming of embedded systems. The programme will be designed and implemented in co-operation with the corresponding programme at Åbo Akademi University.

The programme leads to a Master of Science degree in Technology (diplomi-insinööri (DI) in Finnish). It is a two-year programme designed to give a good understanding of theoretical issues for starting PhD studies in the field of embedded computing as well as practical competences for challenging design tasks in the Embedded Systems Industry. Courses are jointly managed by the University of Turku and Åbo Akademi University, and take advantage of modern educational technology. Education is given in English, and the students of this international programme learn to work together with associates from different countries and scientific backgrounds.

The aim of the Master's Degree Programme in Embedded Computing is to offer:

- multidisciplinary education, which addresses systematic design of embedded systems from both hardware and software perspective.
- profound knowledge in the field of embedded computing.
- ability to model, design and verify advanced embedded solutions.
- understanding of the factors that influence hardware/software tradeoffs.
- ability to carry out research in the field, analyse research results and perform innovative design tasks.
- competence for postgraduate studies in the field of embedded computing.

## Admission requirements

### *Academic requirements*

A completed university level Bachelor's degree in Computer Science or Computer Engineering is required for admission.

### *Language requirements*

Applicants to the Master's degree programmes taught in English must always prove their knowledge of the English language.

### *Application period*

The application period for studies starting in September runs from the beginning of December until late February.

For details, please see the admission pages at <http://embeddedcomputing.utu.fi/>

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This programme is offered by the Department of Information Technology at the University of Turku.



**Degree awarded**  
Master of Science in Technology

**Duration**  
2 years (120 ECTS)

**Language of instruction**  
English

**Location**  
University of Turku - Turku, Finland  
[www.utu.fi](http://www.utu.fi)

**Programme start**  
late August/September



### Availability of latest technologies

1. Iceland
2. Sweden
3. Finland
4. Denmark
5. Finland
6. United States
7. Norway
8. Switzerland

Source: The Global Information Technology Report 2008-2009



## Course overview

Master of Science in Technology (120 ECTS)

### A. Advanced-level studies in the major subject 65-70 ECTS

- a. Compulsory courses as listed in modules EC1 and EC2
- b. Compulsory as well as optional courses as listed in module EC3

or

An Embedded Computing related Core Competence -module CC offered by one of the partner universities in NMS iICT

### B. Optional and language studies 20-25 ECTS

- a. Studies in the minor subject (20 ECTS)  
Courses listed in module IE offered by the Innovation and Entrepreneurship offered by Turku School of Economics
- b. Optional studies (20 ECTS) module EC4
- c. Language studies (0-5 ECTS)

### C. Master's thesis 30 ECTS

The Master's thesis represents the practical and theoretical parts of a research task.

EC1 (20 ECTS)  
System Modelling with SystemC  
HDL Based Design  
Real-Time Systems  
Programming of Embedded Systems

EC2 (20 ECTS)  
SoC Design  
FPGA Prototyping  
Modelling of Embedded Systems  
Design Methods for Embedded Systems

*Mutually exclusive modules EC3 and CC are:*

EC3 (25-30 ECTS)  
*Compulsory courses (15 ECTS)*  
Multiprocessor Architectures  
System Verification  
Formal System Modelling and Verification

*Optional courses (10-15 ECTS) in subjects related to Embedded Computing, e.g.*  
Reconfigurable Computing  
Advanced Networking for Embedded Systems  
Applied Signal Processing, theory  
Code Optimization

*All courses are 5 ECTS.  
Please note that the course list is subject to change.*

CC (30 sp)  
The student can choose one Embedded Computing related Core Competence - module according to her/his personal study plan.

EC4 (20 ECTS)  
Optional courses in subjects related to Embedded computing.

IE (20 ECTS)  
Innovation and Entrepreneurship -module is based on long experience on entrepreneurship and innovation research-based teaching and development activities of the Turku School of Economics (TSE). The main idea behind Innovation and Entrepreneurship -module is to give the student a comprehensive picture of current innovation and entrepreneurship issues. Additionally, ICT and related industries.

Courses  
Innovation and entrepreneurship in ICT context  
New business models  
Business competence and innovations  
Innovations and global growth

### Contact

Programme director:  
Hannu Tenhunen

Program coordinator:  
Päivi Rastas

[embeddedcomputing@utu.fi](mailto:embeddedcomputing@utu.fi)

<http://embeddedcomputing.utu.fi/>

## Master's thesis

At the end of the studies, students will do their master's theses. The subject of the master's thesis will be connected to the research and development projects carried out at the university or in industry.

## Career prospects

The students graduating from the programme will have a multidisciplinary education, which addresses systematic design of embedded-systems from both hardware and software perspective. The profound knowledge in the field of embedded computing together with innovation and entrepreneurship studies offers the ability to work in the embedded systems industry from start-up to large-scale enterprises. After graduating research oriented students may pursue for a doctoral degree to extend their knowledge and increase their job prospects in academia, industry and public sector.

# Master's Degree Programme in Global Information Technology Management



Turun yliopisto  
University of Turku

Global Information Technology Management (GITM) Master's degree programme focuses on linking information technology (IT) and organisational processes. The tight link between IT and organisational processes means creative and innovative cooperation between various organisational units, in order to get more value from IT and increase its organisational competence.

Information and communication technologies (ICT) are an increasingly integral part of products and services as well as the foundation of business processes. Therefore, organisations must know how to make the right choices with respect to new IT-related innovations and, at the same time, ensure that existing business processes continue to receive high quality service from IT.

Information Systems Science has offered this GITM programme since 2003. All teaching is given in English. The purpose of the GITM programme is to train professionals to work in information resources management in international enterprises and in international project environments within the ICT-enterprises. The programme prepares students with a background in business and/or information technology or computer science, in order to become "hybrid" managers at the interface between IT and business functions.

## Admission requirements

### *Academic requirements*

A completed university level Bachelor's degree corresponding Finnish Bachelor of Science in Economics and Business Administration or university level Bachelor's degree equivalent to Finnish Bachelor of Science (majoring in information systems, computer science, software engineering, or industrial engineering and management) is required for admission.

### *Language requirements*

Applicants to the Master's degree programmes taught in English must always prove their knowledge of the English language.

### *Application period*

The application period starts in the beginning of December and runs until the beginning of February for studies starting in September.

For details, please see the admission pages at <http://www.tse.fi/EN/units/mastersprogrammes/gitm/admission/Pages/default.aspx>

University of Turku is an internationally acknowledged, multidisciplinary scientific university located on the Southwest coast of Finland, in the vivid city of Turku.

With 21,000 students and 3,000 employees, it is one of the major universities in Finland. Expertise within the University and its seven faculties ranges from humanities to natural sciences.

This programme is offered by Turku School of Economics at the University of Turku



**Degree awarded**  
Master of Science (Economics and Business Administration)

**Duration**  
2 years (120 ECTS)

**Language of instruction**  
English

**Location**  
University of Turku (Turku School of Economics)- Turku, Finland  
[www.utu.fi](http://www.utu.fi), [www.tse.fi](http://www.tse.fi)

**Programme start**  
late August/September



### Innovation Leaders

1. Finland
2. Sweden
3. Switzerland
4. Japan
5. Singapore
6. Israel
7. United States
8. Germany

Source: Global Summary Innovation Index, TrendChart, 2007



### Contact

Programme Director and Coordinator: Eija Koskivaara

[gitm@tse.fi](mailto:gitm@tse.fi)

<http://www.tse.fi/EN/units/master-programmes/gitm>

## Course overview

Master of Science (Economics and Business Administration) 120 ECTS

### Major:

#### Information Systems Science

Advanced studies in Information Systems Science (60 ECTS)  
Research methods (6 ECTS)  
Master's thesis (30 ECTS)

If a student does not have a major in Information Systems in his/her bachelor's degree, obligatory basic studies must be completed by taking additional examinations in the form of book exams and research essays.

### Minor:

#### International Business OR Management & Organisation OR Entrepreneurship

International Business (25 ECTS)  
Management and Organization (25 ECTS)  
Entrepreneurship (25 ECTS)

### Languages and communication

First foreign language: Courses in English, at least 4 ECTS  
Second foreign language, foreign students: 6 ECTS of Finnish studies

### Methodology studies

Methodological studies (7 ECTS)

### Supplementary studies:

Supplementary studies are courses required at the Turku School of Economics for applicants who meet the admission requirement but do not have enough previous studies in information systems, business or English.

## Master's thesis

After completing all the courses, students will do their thesis project during the second spring term. In most cases, the thesis is done in industry co-operation and supervised by Information Systems Science faculty members.

## Career prospects

The programme prepares students with a bachelor background in either business or information technology or computer science to become "hybrid" managers at the interface between information systems and business functions within an increasingly international business context. GITM-graduate understands the tight link between IT and organisational processes. Therefore, they are able to provide creative and innovative cooperation between various organisational units, in order to get more value from IT and increase its organisational competence. They can work, for example, as IT project managers or IS strategy consultants in international companies. In addition, this programme prepares graduates for PhD studies.

# Master's Degree Programme in Information Technology



Turun yliopisto  
University of Turku

The University of Turku offers a two-year Master's Degree Programme in Information Technology. This programme offers its students the opportunity to become an expert in one of two very specialized areas in the field of information and communication technology:

- Information Security
- Work Informatics

In the Information Security study track, students gain both theoretical knowledge and hands-on experience whether dealing with secure network and communication systems, secure computing systems or mathematical foundations of data security including cryptographic algorithms and protocols. Characteristic to the Information Security study track is a strong motivation to learn and explore technological and theoretical scientific advances in the field based on newest research.

The Work Informatics study track covers most of the information systems area having its focus on work-related aspects. It reflects all three modalities of work: individual work, collective work and services; and the role of information technology in them. Knowledge in work organisations and changes in them receive particular attention. The Work Informatics study track emphasizes the social, psychological, political, economic and organisational aspects while keeping information technology an important part of the whole.

## Information Security

<http://www.infsec.utu.fi>

This study track is organized into two specialization areas: Cryptography and Data Security and Networked Systems Security. Students of Cryptography and Data Security specialization area graduate with Master of Science degree (MSc). Students of the Networked Systems Security specialization area graduate with the Master of Science in Technology degree (MSc(Tech.)).

The Cryptography and Data Security specialization area focuses on cryptography research from the mathematical point of view. The goal of this specialization area is to educate future experts of the field that have strong and broad knowledge on mathematical aspects of cryptography and data security. Modern symmetric and asymmetric cryptography algorithms and protocols are studied and analysed from the mathematical point of view. The students learn to assess the strengths and weaknesses of cryptographic solutions based on a deep understanding of the underlying theory. The students also gain the ability to pursue designing cryptographic algorithms and protocols for real applications.

The Networked Systems Security specialization area focuses on researching information security technologies for networked systems and applications of the communication-intensive future from the engineering point of view. The technological topics covered include system and network security, security of communication systems and applications, and security in system design. The goal of this specialization area is to give its students profound and substantial education and expertise in the networked systems security field. The topic is approached in a multidisciplinary fashion with obligatory studies also on cryptographic and management aspects of information security. The graduates of this specialization area will benefit from the strong technological, theoretical and practical understanding and skills they have obtained in the programme upon building a successful career in securing the information and communication technology industry.

University of Turku is an internationally acknowledged, multidisciplinary scientific university located on the Southwest coast of Finland, in the vivid city of Turku.

With 21,000 students and 3,000 employees, it is one of the major universities in Finland. Expertise within the University and its seven faculties ranges from humanities to natural sciences.

The programme is offered by the Department of Information Technology, Department of Mathematics and Turku School of Economics at the University of Turku.



**Degree awarded**  
Master of Science  
Master of Science in Technology  
(Information Security track only)

**Duration**  
2 years (120 ECTS)

**Language of instruction**  
English

**Location**  
University of Turku - Turku, Finland  
[www.utu.fi](http://www.utu.fi)

**Programme start**  
late August/September



## Work Informatics

<http://workinformatics.utu.fi/>

In Work Informatics, the core competence is in understanding, analysing and improving the deployment of information technology, during use and development of information systems in organisations.

The future Masters have their core competence in theoretical and practical understanding of the relationship between IT and work. This gives them readiness to take a wide range of IT-related work roles. These information system experts act as mediators between the systematic world of information technology and the continuously changing environment of human work and activities.

The Work Informatics programme starts with the Knowledge Work course, which presents the three modalities of work. Following courses deal with services, co-operative work, implementation of Information Systems, knowledge management and Information Systems evaluation. All these subjects are studied from Work Informatics perspective. Also courses on IT and ethics, theoretical foundations of Information Systems and usability testing are available.

The Work Informatics programme contains a lot of practical exercises in local companies and organizations. They help in applying the theories and concepts to complex real work settings.

### Top Ten IT Countries of the World

1. Sweden
2. Denmark
3. Netherlands
4. Norway
5. Finland
6. New Zealand
7. Switzerland
8. United States

Source: IDC/World Times Information Society Index, 2003



## Career prospects

Students graduating from the programme will have profound knowledge in the field of information technology with specialization in the discipline of their study track. The graduates will benefit from the high level of skills and knowledge obtained in the programme in building a successful career in the information technology industry from start-up to large-scale enterprises. The opportunities are further strengthened by the optional innovation and entrepreneurship studies available for students in the programme. After graduation, research oriented students may pursue a doctoral degree to extend their knowledge and further increase their career prospects in academia, industry and the public sector.

### Contact

Programme director:  
Jukka Teuhola

Programme coordinator:  
Päivi Rastas

[mastersprogram@it.utu.fi](mailto:mastersprogram@it.utu.fi)

[www.it.utu.fi/mastersprogram](http://www.it.utu.fi/mastersprogram)

## Admission requirements

### *Academic requirements*

A completed university level Bachelor's degree in a relevant field of study. Depending on the chosen study track, a relevant field of study can vary from mathematics, computer science, communication systems, computer engineering to other closely related fields.

### *Language requirements*

Applicants to the Master's degree programmes taught in English must always prove their knowledge of the English language.

### *Application deadline*

The application period for studies starting in September runs from the beginning of December until late January.

For details, please see the admission pages at:  
[www.it.utu.fi/mastersprogram/apply.html](http://www.it.utu.fi/mastersprogram/apply.html)

# Master Studies in Software Engineering



Software Engineering focuses on the systematic, efficient and effective development of software systems. The study programme in Software Engineering comprises the use of specification, design, programming, validation and lean project planning and management to develop high quality, affordable and maintainable software systems. Communication skills and team work are also an important part of the studies. There is a special emphasis on the development of Internet-based software services and applications.

The study programme is designed to provide the student with the necessary knowledge and skills to join the software industry and participate in demanding software development projects. It also provides the required background for doctoral research in Software Engineering.

Successful completion of this two-year full-time study programme results in the award of a Master of Science (Technology) degree in Computer Engineering – Software Engineering.

## Objectives of the Programme

During the programme the students will acquire the following skills:

- Learn advanced specification, design, programming, and validation techniques
- Understand software project planning, management methods and tools
- Improve communication and team-work skills
- Familiarize with the development of web-based software services and applications
- Participate in demanding software development projects
- Obtain knowledge and competence to join the software industry

## Master's thesis

After completing all the courses, students will do their thesis project either at the department by contributing to the scientific research of the university or in industry under the guidance of local or external advisors.

## Career prospects

When graduating, the students will have both a good understanding of theoretical issues for starting PhD studies, as well as practical competences for a successful career as software engineers in the industry. The numerous fields in which software systems are applied ensure a wide range of career opportunities in Finland and abroad.

## Admission requirements

Participation is limited to 10 persons. The programme is open to those holding a Bachelor's degree in Computer Engineering or Computer Science or a closely related field. Sufficient knowledge in English language is also required.

For details, please see the admission pages at [www.abo.fi/master](http://www.abo.fi/master)

Åbo Akademi University was founded in 1918 and is the only Swedish-language multidisciplinary university in Finland.

The university offers both undergraduate and postgraduate studies and extensive research opportunities to some 7,000 students on three campuses: Åbo, Vasa and Jakobstad.

This programme is offered by the Department of Information Technologies at the Åbo Akademi University



**Degree awarded**  
Master of Science (Technology)  
Degree ( diplomingenjör)

**Duration**  
2 years (120 ECTS)

**Language of instruction**  
English

**Location**  
Åbo Akademi University - Turku  
[www.abo.fi](http://www.abo.fi)

**Programme start**  
September



### Contact

Programme Director  
Ivan Porres

Programme Coordinator:  
Dragos Truscan

[softwareengineering@abo.fi](mailto:softwareengineering@abo.fi)  
<https://www.abo.fi/se>

# Student testimonials

**LIANG, China**  
PhD student, Information Technology

The research and study here are inspiring and rewarding. I truly enjoy my research work with proper flexibility, comprehensive discussion and motivating supervision. I have the opportunities to cooperate with internal colleagues and external domestic or foreign experts. Extracurricular activities are also entertaining, including culture visits, lectures and other social events with local and international students and staffs.



**JAMILA, Slovakia**  
Master student, Electronic and Mobile Commerce

I first came to Turku as exchange student and I was so excited about studying at Åbo Akademi University that I decided I have to come back. Now, when I am almost done with my Master's degree in Electronic and Mobile Commerce, I can say it was the best decision I could make. There is a great choice of subjects not only at home university but also at other universities in Turku. I think, that every student appreciates the opportunity to manage their own study plan according to personal interests.



**PIA, Finland**  
Master student, Bioinformatics

I have a background in Biotechnology, but thanks to the skilled and patient teachers, I have been able to learn a great deal about programming, computing, and how to combine these fields as a whole. The international environment is a big plus and you get to know different cultures. Libraries, teaching and computer classes are of a high level. You have a very broad range of classes to choose from, thanks to the co-operation between different universities. The university also offers a wide range of interesting activities such as sports, cultural events and parties.



**MATTEO, Italy**  
PhD Student, Information Systems

Studying in TUCS is a great opportunity. Docents are very friendly and helpful. What I have liked the most is that I have always been encouraged to cultivate my own ideas and, at the same time, I have also never lacked their support and trust. Moreover, the environment is very international and the foreign students are very numerous.



## Turku Science Park - Focused expertise

Curiosity and the desire to experiment. Long-term research and the determined application of research results. Courage to try new things. Experts from three universities and numerous companies come together in the Turku Science Park, next to the city-centre. Here, the knowledge and creativity of individuals, together with the freedom of research, grow into innovations for companies and communities, creating not just world-class science but also financial benefit.

Turku Science Park joins together academic and business experts. Our key fields are biotechnology and ICT. We offer a unique setting for the commercialisation of research-based innovations and the creation and growth of business operations related to high technology. The Turku Science Park is an effective and inspiring operating environment in which all of the elements necessary for success are present. The innovation process is like a decathlon: it requires both endurance and the mastery of many skills. Companies need experts' input for product development and growth, scientific innovations need channels for commercialisation, and the business world needs new successful companies. The Turku Science Park advances the realisation of these goals. The genuinely urban science park is one of the largest, oldest and fastest-growing in the country.

# TUCS Graduate Programme

TUCS Graduate Programme (TUCS GP) offers a framework for studying for the doctoral (PhD) degree in science, engineering or economics. It is truly international graduate programme and hot-spot for the latest development in ICT. Study time for a full-time student is expected to be 4 years. TUCS GP provides additional instruments and training for preparedness of our students for challenges in working life, like mentorship and internship programmes and an MBA programme.

There are more than 100 students within TUCS GP. As the Graduate Programme is open for students from everywhere and almost half of the students come from abroad, the environment at TUCS Graduate Programme is highly international. There are no tuition fees at Finnish universities at the moment, since the universities are financed by the Finnish Government. Doctoral students are entitled - but not obliged - to join the Student Union of their university, and this involves a minor annual fee.

Each student, who is accepted to the TUCS GP is placed in one of the TUCS Research Centres, and is assigned a personal supervisor, typically a professor. Also fellow researchers at the centres give guidance to new students.

The students are expected to take advanced level courses from at least two of the TUCS main research areas. The language of instruction is English.

The co-operation between the University of Turku and Åbo Akademi University give the TUCS students the possibility to participate in courses at all three universities. In addition, TUCS Graduate Programme provides active exchange programmes with other leading European research groups.

## Student positions at TUCS GP

### *TUCS funding*

TUCS can provide full economic support for up to 4 years for full-time graduate studies and research via employment at one of the participating universities. Doctoral students who get a salary are entitled to all the benefits of the Finnish employment relationship, including occupational health care. The final salary level is determined according to the principles of the new salary system in the Finnish universities and relates to qualifications and study progress of the student.

### *TUCS status*

Students with other sources of funding can also be accepted to the Graduate Programme. Students with TUCS status are entitled to all the benefits that come with the student position, excluding salary. Typically, they are funded directly by the laboratories via employment to a research project or various scholarship arrangements with external funding agencies.



### TUCS main areas of research

- \* Algorithmics
- \* Bioinformatics
- \* Communication Systems
- \* Discrete Mathematics
- \* Embedded Systems
- \* Information Systems
- \* Mathematical Modelling
- \* Computer Engineering
- \* Software Engineering

### TUCS Research Centres

#### **CSBE - Centre for Software Business and Engineering**

CSBE is a research unit comprising elements from both the University of Turku and Turku School of Economics, with the joint aim of collaborating on research with high-impact goals for both the academic body of knowledge and industrial practice.

#### **CREST - Centre for Reliable Software Technology**

CREST is a research centre within Åbo Akademi University and TUCS. CREST is a Centre of Excellence for Formal Methods in Programming.

#### **FUNDIM - Fundamentals of Computing and Discrete Mathematics**

FUNDIM is a research centre at University of Turku and Turku Centre for Computer Science. Currently, the research covers a large spectrum of discrete mathematics connected to foundations of computing.

#### **IST - Information Society Technologies**

IST is a research centre at University of Turku and TUCS. Research and education are practiced in interaction with the industry and trade for individual wellness and inclusive information society. Thematic focus areas include biomedicine and health care, safety and security, education and democracy.

#### **IAMSR - Institute for Advanced Management Systems Research**

IAMSR is a research institute within Åbo Akademi University and TUCS. IAMSR's objective is to study and develop the theory and applications of knowledge based systems in management.

# Benefits for students

In addition to providing the students with a laboratory, a supervisor, and funding, the students at TUCS Graduate Programme have a number of other benefits. The participating university departments have the employer responsibility of TUCS PhD students, and arrange a working room and other necessary facilities for the research and studies. Due to strong external funding, TUCS facilities are excellent.

The Graduate Programme monitors both the progress of studying and the quality of supervision what PhD students receive from their supervisors. The TUCS Graduate Programme emphasizes the interaction between students and research groups and cooperative multidisciplinary research. All students at the Graduate Programme are entitled to publish within the TUCS publication series and are encouraged to present their work in international conferences and workshops. Students are entitled to apply for travel grants for participation in conferences.

## How to apply

### Prerequisites to the Graduate Programme

#### *Master's degree*

A Master's degree is expected in Computer Science, Mathematics, Information Systems, Computer and Software Engineering, or in a related field. The degree should be equivalent to a Master's degree awarded by a Finnish university.

#### *Knowledge of English*

A language test is not required from applicants who have already obtained the right for doctoral studies at one of the universities in Turku. A language test is required from all other applicants. The accepted language tests are TOEFL and IELTS, and the test score must come directly from the testing centre.

The minimum test scores:

IELTS: Average 6.5; no individual scores below 5.5.

TOEFL: 575 points (paper based total) or 232 points (computer based total) or 90 points (iBT total).

For more detailed information on language requirements, please see our website.

### Application procedure

There are two application rounds per year. The fall application round is usually for the status only and the spring application round is for the status and the financing.

The application must consist of the Graduate Programme application form (available online) and the required enclosures. The application form and all the documents, except the language test score and the recommendation letters, must be sent by the applicant.



### MBA for PhD

All TUCS PhD students also have the opportunity to apply to the new and innovative multidisciplinary MBA programme (Master of Business Administration) with focus on innovation and entrepreneurship in ICT. It offers postgraduates and doctoral students a unique opportunity to acquire knowledge and business competence in order to enhance their career options or pursue business activities after or along with academic career.

The programme combines PhD and MBA studies in an innovative and flexible way increasing diversification of doctoral career options.



### More information on how to apply and a list of required documents:

<http://tucs.fi/education/phd/how-apply/>

### Contact information

Turku Centre for Computer Science  
Joukahaisenkatu 3-5 B, 6th floor  
20520 Turku, Finland  
Phone +358-2-215 4204  
Fax +358-2-241 0154  
Email [tucs@abo.fi](mailto:tucs@abo.fi)

Outi Tuohi, Coordinator  
Phone +358-2-215 3364  
Mobile +358-50-409 6435  
Email [outi.tuohi@abo.fi](mailto:outi.tuohi@abo.fi)



### Local availability of specialized research and training services

1. United States
2. Switzerland
3. Netherlands
4. Finland
5. Germany
6. Denmark
7. Sweden
8. France

### Venture capital availability

1. United States
2. Norway
3. Netherlands
4. Finland
5. Sweden
6. Hong Kong SAR
7. United Kingdom
8. Israel

### Accessibility of digital content

1. Sweden
2. Estonia
3. Switzerland
4. Finland
5. Denmark
6. Korea, Rep.
7. United States
8. Iceland

Source: World Economic Forum, Executive Opinion Survey 2007, 2008

# Partner in Innovation and Growth MBA programme for PhD Students

The new and innovative, multidisciplinary MBA Programme (Master of Business Administration) offers postgraduates and doctoral students a unique opportunity to acquire knowledge and business competence in order to enhance their career options or pursue business activities after or along with academic career.

Participants benefit from the MBA programme in multiple ways:

- Get support for innovation and commercialization activities
- Acquire needed entrepreneurial skills to business start-up and business planning
- Improve one's competitiveness in obtaining managerial positions in existing companies
- Engage in collaboration with enterprises and peers in the academic community
- Expand professional networks

The programme provides good preparedness and career booster to work either in corporate environment in top level technical management or senior expert positions as well as provides skills and tools in launching successfully own venture activities. The learning outcomes from the programme are highly valued in job market globally.



Build your own training portfolio

The programme combines PhD and MBA studies in an innovative and flexible way increasing diversification of doctoral career options. The MBA programme consists of three study modules, of which the participating students can choose the most fitting courses for their study portfolio depending on their previous studies and individual learning needs.

The three modules together constitute a programme offered jointly by the Turku School of Economics and the Turku Centre for Computer Science. The completion of both doctoral studies and the MBA programme constitute a highly competitive study combination.



## Programme content

### I Module – Basic studies

The first study module is common to all students despite their discipline. The focus is on the basics and regularities of business competence.

### II Module – Innovation and Entrepreneurship studies

The second module consists of study units with special emphasis on practical business cases with reference to the disciplines of the students. They will have an opportunity to prepare a Business Plan and gain understanding and skills in business start-up activities and commercialization of academic research results

### III Module – Industry specific activities

In the third module, the students are engaged in close cooperation with partner enterprises in mutually beneficial activities; the students can produce an MBA Thesis that fits to the needs of the partner enterprise, and in return, contribute by providing the partner enterprise with cutting-edge disciplinary specific expertise. The level of the enterprise collaboration depends on the Thesis topic.



## Enrolment

MBA programme is coordinated by the Business and Innovation Development BID, Turku School of Economics and TUCS.

For further information, please contact

Turku School of Economics  
Business and Innovation Development  
[www.tse.fi/bid](http://www.tse.fi/bid)  
Sari Stenvall-Virtanen  
[sari.stenvall@tse.fi](mailto:sari.stenvall@tse.fi)

# TUCS in a nutshell

Turku Centre for Computer Science (TUCS) is a joint research and education centre between the University of Turku, Åbo Akademi University and Turun ammattikorkeakoulu, all located in the same campus area in Turku, Finland. TUCS coordinates university research and education in Southwest Finland in the field of Information and Communication Technologies.



The activities are carried out in the TUCS Master's and Graduate Programmes and in the TUCS Research Centres and joint research laboratories. TUCS Graduate Programme was the pioneer for the Finnish Graduate School system. At the TUCS Research Centres there are presently about 35 professors, 70 PhD level researchers, 120 doctoral students and 2000 Master's students. The research groups at TUCS are well recognized world-wide. Well-established research areas include Algorithmics, Bioinformatics, Communication Systems, Discrete Mathematics, Embedded Systems, Information Systems, Mathematical Modelling, Computer Engineering, and Software Engineering.

The mission of TUCS is to actively encourage formation of new multi- and interdisciplinary strategic centres for fostering new academic excellence, coordinate international innovative large-scale MSc and PhD education, and to act as a catalyst for joint research between the participating laboratories and for the interaction with the society. Focusing especially in research and innovation, TUCS provides a joint platform for the participation of local actors in EU projects as well as in large-scale national activities.

The international role of TUCS has been strengthened by developing and increasing the number of joint actions with different partners. TUCS has especially developed co-operation within the Nordic countries, with other EU countries and with China.

Nationally TUCS is promoting technological innovations, for example, through involvement in ICT education cooperation organisations FIGSIT and INFORTE, supporting joint summer schools and short courses, as well as coordination and quality assurance.

TUCS is closely involved with the Turku Science Park, which joins together academic and business experts in the Turku region. Together with Turku School of Economics, TUCS is developing the Turku Innovation Platform - a collaboration project of universities in the Southwest Finland, which aims to better integrate innovation and entrepreneurship ideologies within the ICT education at MSc and PhD levels.



## TURKU CENTRE *for* COMPUTER SCIENCE

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*Reach out for your dreams*