University of Miskolc
Faculty of
Mechanical Engineering and Informatics

Doctoral School: József Hatvany Doctoral School for Computer Science and Engineering

Name of the Study Program: PhD Programme in Computer Science and Engineering

The program is designed for individuals who / Introduction:

The doctoral school offers the opportunity to pursue a doctoral degree to those with a master's degree who are interested in research and development in applied and theoretical computer science. The doctoral school deals with three main topic areas: applied computer science, information technology for production engineering (including measuring and control engineering information systems), and material flow systems (information technology for logistics). The doctoral programme can be undertaken through a course-based structure or independently. The doctoral school deals with three main topic areas:

- Applied Computer Science;
- Information Science for Production Engineering (including measuring and control systems) ;
- Material Flow Systems (information technology for logistics).

Completing the Program, you will be able to / Career opportunities:

Research engineer on almost any field of Information Technology fields (software development, programming, OS and databases). Graduates are able to carry out and coordinate research and development tasks in computer science. Academic and teaching positions in higher education.

Name of the degree: Phd in Computer Science Engineering

Language of the program: English

Duration of the Study Program: 8 semesters

Structure of the Study Program

The doctoral program is a 4-year program consisting of two periods both having a length of two years. The first two year stage (study-research phase) is a course-based period; the students must take courses to acquire the professional knowledge in Information Science and Mathematics. At the end of the study-research phase, there is a Complex Exam. The exam relates to two selected courses passed by the student, to the research activity of the first period and the proposed research plan of the second period. The second period of the program is devoted to the research activity. In the second phase, the research - dissertation period, the main goal is to publish high-quality papers on the selected research work.

The students are have to take a mandatory and an elective course-unit consisting of four major subjects, where after passing the exams they can obtain acquire the professional knowledge in information science and Mathematics. In accordance with the research field of applied information engineering, students can choose either mathematics or information science (in the ratio 2:1) depending on their interests and the chosen topic.

Mandatory Courses

Area	NEPTUN Code	Title	Institute
A	GEMAN401	Discrete Mathematics I	Mathematics
A	GEMAK416	Theory of Algorithms	Mathematics.
A	GEMAN421	Matchematical Logic with Applications	Mathematics
A	GEIAL401	Paradigms of Programming	Informatics

Elective / Optional Courses

Area	NEPTUN Code	Title	Institute
SZT	GEMAN411	Differential and Integral Equations	Mathematics
SZT	GEIAL424	Ontology Management Systems	Informatics
SZT	GEMAK409	Paralel algorithms	Mathematics
SZT	GEMAK406	Complexity of Algorithms	Mathematics
SZT	GEMAN403	Discrete Mathematics II	Mathematics
SZT	GEMAN402	Modern Analysis	Mathematics
SZT	GEMAK411	Numerical Methods I	Mathematics
SZT	GEIAL421	Theory and technology of data mining	Informatics
SZT	GEIAL407	Distributed and Parallel Systems	Informatics
SZT	GEMAN422	Lattices, Concept Lattices and Fuzzy Systems	Mathematics
SZT	GEAGT401	Computer aided curve and surface modelling	Ábrázoló Geom.
SZT	GEIAL403	Operating Systems	Informatics
SZT	GEMAK404	Information and Coding Theory	Mathematics
SZT	GEMAK413	Optimization Theory	Mathematics
SZT	GEMAK412	Numerical methods II.	Mathematics
SZT	GEAHT411	Numerical Methods in Fluid and Heat Engineering	Fluid and Heat Engineering
SZT	GEFIT411	Computer Simulation of Physical Processes	Physics

SZT	GEVGT425	Optimization of Structures	Chemical Machinery
SZT	GEMAN424	Methods for Differential Equations	Mathematics
SZT	GEMAN425	Methods for Nonlinar Differential Equations	Mathematics
SZT	GEMAN426	Numerical Methods for Differential Algebraic Equations	Mathematics
SZT	GEIAL402	Distribuited Algorithms	Informatics
SZT	GEIAL415	Grid Systems	Informatics
SZT	GEMAK414	Stochastic Methods	Mathematics
SZT	GEIAKX1	Programming of Graphical Processors	Informatics
SZT	GEIALX1	Graphical Algorithms in Game Development	Informatics
SZT	GEIAL432	Soft Computing	Informatics
SZT	GEIAL481	Nature Inspired Optimization Methods	Informatics
SZT	GEIAL??	Sofware Defined Networks	Informatics
SZT	GEIAK433	Knowledge Representation and Reasoning Methods of Expert Systems	Informatics
SZT	GEVGT990N	Methodology of Publicaton Process	Chemical Machinery
SZT	GEMAK420	Cryptography	Mathematics

SZT	GEIAL456	Fuzzy Systems	Informatics
TR	GEIAK401	Theory of Manufacturing Processes and Systems	Informatics
TR	GEIAK405	Principles, Models and Methods in Computer Integrated Manufacturing	Informatics
TR	GEIAK406	Computerized Production Planning and Control	Informatics
TR	GEIAK407	Theory of Computer Aided Production Control	Informatics
TR	GEIAK403	Modelling of Manufacturing Processes	Informatics
TR	GEIAK408	Numerical Control of Machine Tools	Informatics
TR	GEIAK415	Computer optimisation of gears mating	Informatics
TR	GEVAU401	Information Systems in Control Engineering	Aurtomation Technology
TR	GEVAU415	Telecommunication in Control Systems	Automation Technology
TR	GEVAU460	Embedded Systems and Architektures	Automation Technology
TR	GEVAU413	System on chip design and modelling methods	Automation Technology
TR	GEVAU404	Speech Information Systems	Automation Technology
TR	GEVAU402	Intelligent Controlling	Automation Technology
TR	GEVEE405	Electronic systems and metrology	Electrical Engineering.
TR	GEVEE412	Computer aided measurement systems	Electrical Engineering.

TR	GEVEE413	Computer aided electronic design	Electrical Engineering.
TR	GEVEE414	Electromagnetic Compatibility (EMC)	Electrical Engineering.
TR	GEVEE415	Power Electronics	Electrical Engineering.
TR	GEVEE416	Electric Servo Drives	Electrical Engineering.
TR	GEVEE417	Electrical modeling and simulation	Electrical Engineering.
LR	GEALT408	Theory of Material Handling Systems	Materials Handling and Logistics.
LR	GEALT410	Mathematical Models of Logistics	Materials Handling and Logistics.
LR	GEALT411	Theory of Logistics	Materials Handling and Logistics.
LR	GEALT412	Purchasing and distribution logistics	Materials Handling and Logistics.
LR	GEALT413	Logistic of Supply Systems	Materials Handling and Logistics.
LR	GEALT414	Logistic of Production Systems	Materials Handling and Logistics.
LR	GEALT415	Logistic of Service Systems	Materials Handling and Logistics.
LR	GEALT416	Logistics of Quality Assurance, Product Logistic	Materials Handling and Logistics.
LR	GEALT417	Recycling Logistics	Materials Handling and Logistics.
LR	GEALT418	Global Logistics	Materials Handling and Logistics.
LR	GEALT419	Storage Systems	Materials Handling and Logistics.
LR	GEALT420	Mathematical Models of Logistics	Materials Handling and Logistics.
SZT	GEMAK40	Combinatorical Algorithms	Mathematics
TR	GEIAK403	Modelling of Production Processes	Informatics
TR	GEVEE418	Automotive electrics and -electronics	Electrical Engineering
LR	GEALT422	Simulation in Material Flow and Logistics	Materials Handling and Logistics
LR	GEALT423	Transportation-Forwarding	Materials Handling and Logistics

Area codes: A: Theoretical Foundations, SZT: Applied Computer Science, TR: Information Science for Production Engineering, LR: Material Flow Systems

Admission requirements:

MSc level degree in Computer / Software /Electrical Engineering

The applicants must fill out and save all requested information on the online application form in the English language. A recent photo of the applicant taken not later than six months ago must also be uploaded.

Research Plan: List of the previous research activities and publications. Description of the proposed research work. A minimum of one page typed in Times New Roman with a font

Motivation Letter: A minimum of one page.

A copy of proof of language proficiency minimum B2 level IELTS, or other internationally accepted certificates. If the instruction language at home country is English, there is no need for any certification. Scanned clearly.

The original copy of the MSc transcripts of Records and their translation in English. The translation should also be sealed and stamped by the Ministry of High Education and confirmed by the Ministry of Foreign affairs. All the documents must be scanned clearly.

Scanned original copy of a medical certificate of satisfactory health condition

Copy of passport : The original copy of two first pages plus the **VISA CONTAINED PAGE** of the applicants' passport, scanned clearly. Having a picture and all the other data stamped sealed officially by the authorities.

Entrance exam

The entrance examination process is supervised by the corresponding Examination Board of the Faculty. The examination process consists of four phases:

- verification of the documents
- evaluation the results achieved in BSc level study
- oral examination / motivation interview with the candidate via Skype
- final rating

The final decision is made by the Examination Board.

Graduation requirements

The doctoral program consists of two periods both having a length of two years. The first two year phase (study-research phase) is a course-based period, the students must take courses to acquire the professional knowledge in Information Science and Mathematics. At the end of the study-research phase, there is a mandatory Complex/Comprehensive Exam. During the 4 study-research semesters, students should acquire 95 credits in order to be able to take the complex exam. The exam relates to two selected courses passed by the student, to the research activity of the first period and to the proposed research plan of the second period. The second period of the program is devoted to the research activity. In the second phase, the research - dissertation period, the main goal is to publish high quality papers on the selected research work.

The students are having to take an elective course-unit consisting of four major subjects, where after passing the exams they can obtain acquire the professional knowledge in information science and Mathematics. In accordance with the research field of applied information engineering, students can choose either mathematics or information science (in the ratio 2:1) depending on their interests and the chosen topic.

If the chosen course requires it, further theoretical foundation subjects can be taken within or in addition to the block called Optional Subjects. The main fields of mathematics foundation are as follows: Modern Analysis, Discrete Mathematics and Mathematical Logic. The main fields of the theoretical information science foundation are as follows: Information Theory, Theory of Programming and Programming Paradigms.

The students are required to take optional fundamental subjects from the offered list for their interested topic, and to pass exams. This may give the chance to the potential students to acquire the theoretical knowledge of the chosen (research) area in the application.

The other complementary sub-task, which is so important, is to publish and develop the research work which the candidate has achieved during academic period.

In the doctoral training 240 credits have to be obtained as follows.

a) 40 credits – acquiring mandatory studies (5 credits for one subject),

b) Minimum 50 credits for publications

c) Minimum 20 credits for scientific research projects

d) Maximum 20 credits for teaching activities, lecturing

e) Minimum 20 credits for conference presentations

f) 25 credits for passing the Complex exam

All publications must be registered in the Hungarian MTMT information system (url: www.mtmt.hu). Important: the publication activity is accepted only if it is registered in the MTMT.

The quality requirements on the publications for the doctoral degree:

- Minimum 2 scientific journal papers where the PhD candidate is the first author

- Minimum one journal paper having a Q3 ranking (SCImago ranking)

Application/Tuition fee: Please visit: http://englishstudyprogrammes.uni-miskolc.hu

Available Scholarship: Please visit: http://stipendium.uni-miskolc.hu

Contact: : kovacs@iit.uni-miskolc.hu