



# The JKU International Master's Program for Informatics

## Specialization Year

Johannes Kepler University (JKU)  
at Campus Softwarepark Hagenberg, Austria



Professor **Bruno Buchberger**, Dr.phil. Dr.h.c.mult.  
Initiator of the **JKU International Master's Program in Informatics**

Member of Academia Europaea  
Professor of Computer Mathematics  
Founder of RISC (Research Institute for Symbolic Computation)  
Founder and Director of Softwarepark Hagenberg  
Founder of the Journal of Symbolic Computation

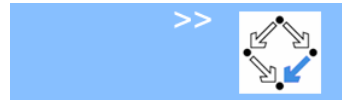
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[www.risc.uni-linz.ac.at/people/buchberger](http://www.risc.uni-linz.ac.at/people/buchberger)

RISC, Johannes Kepler University Linz, A-4232 Hagenberg, Austria



*“A warm welcome to students from all over the  
world to this very special program !”*



# Executive Summary

Starting from October 2007, the **Johannes Kepler University (JKU), Linz, Austria**, offers a **new and innovative master's program in informatics for international students**. The program is briefly described in the appendix of this document. The main part of this document describes opportunities for students to subscribe to the **second year** only of this Master's program, which is a **specialization year**.

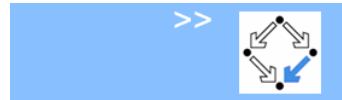
## This opportunity is open for students

- who have a **bachelor** degree in informatics or a related subject (e.g. computer science, business informatics, computer mathematics, applied math, information and communication technology, electrical engineering) of approximately 160 credit hours (approximately **240 ECTS points**) or an equivalent degree
- or who have a **bachelor** degree in informatics or a related subject of 120 credit hours (approximately **180 ECTS points**) **plus** additional courses of a graduate program (e.g. first year of a Master's program) of approximately 40 credit hours (approximately **60 ECTS points**).

The **working language for this program is English**, i.e. all courses are taught in English, the communication language is English as well. Hence the students have to be fluent in English.

The **specialization year** of this **program is unique** in various respects: Each individual student gets assigned **an individual study plan** for this year that is exactly designed for making him/her an expert in the specialization topic chosen at the beginning of the year. Also, the student is assigned an **individual advisor** (a professor who is an expert in the chosen specialization topic) right at the beginning of the specialization year who guides him/her through the entire year and, finally, is also the advisor of the master's thesis. In addition, the specialization year offers **various unique block courses** for developing the creative, intellectual, communication, and social skills of the students. Among these courses is a "Thinking" course that trains the problem solving capability of students based on logic training, an "Experience Europe" program, and the so-called "Acting in Society" course that trains students to become responsible leaders in society.

The **tuition for the specialization year is Euro 8500**. For very good or excellent students a **variety of fellowships** covering tuition and/or living costs is available, offered by Austrian and international industrial companies and governmental and scientific institutions.



# Detailed Description of the Specialization Year

## Structure:

**September:** Block courses, altogether approximately 6 credit hours (9 ECTS points)

- Working techniques (working with literature, oral presentation, paper writing, team work etc.)
- Thinking (predicate logic as a working language)
- Software Engineering Refresher Course

**End of September:** Selection of an individual specialization topic for each student and assignment of an individual advisor.

## October, November, December, January:

- Individual curriculum for each student depending on the chosen specialization topic, consisting of individual courses and seminars, altogether 10 credit hours (15 ECTS points)
- Project Presentation Seminar, 2 credit hours (3 ECTS points)
- English Training (2 credit hours, 3 ECTS points)

## February:

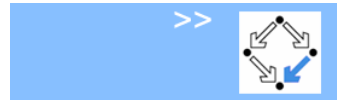
- Exams
- Preparation of master's thesis
- Project Management, 2 credit hours (3 ECTS points)
- Acting in Society, 1 credit hour (1,5 ECTS points)

## March, April, May, June:

- Working on the master's thesis (30 ECTS points)
- Acting in Society, 1 credit hour (1,5 ECTS points)
- Project Presentation Seminar, 2 credit hours (3 ECTS points)

## July, August:

- Revision and final version of master's thesis
- Defense of master's thesis and master's exam.



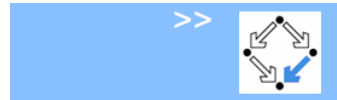
## Admission:

For admission to the specialization year the student needs:

- A **bachelor** degree in informatics or a related subject (e.g. computer science, business informatics, computer mathematics, applied math, information and communication technology, electrical engineering) of approximately 160 credit hours (approximately **240 ECTS points**) or an equivalent degree or a **bachelor** degree in informatics or a related subject of 120 credit hours (approximately **180 ECTS points**) **plus** additional courses of a graduate program (e.g. first year of a Master's program) of approximately 40 credit hours (approximately **60 ECTS points**).
- A **detailed transcript of all courses** taken during the past academic study, including grades. If a student applies in spring for our specialization year starting in fall, he also should list all his current and planned courses of the ongoing academic year.
- 2-3 **recommendation letters** by professors.
- Fluency in **English**.
- The documents listed on the following web-page for **registering** at the Johannes Kepler University, Linz:  
[http://www.students.jku.edu/international/content/e11/e877/index\\_eng.html](http://www.students.jku.edu/international/content/e11/e877/index_eng.html)
- **Austrian visa**: We will help you with obtaining the necessary student's visa. See the web-page:  
[http://www.students.jku.edu/international/content/e15/e258/e263/index\\_eng.html](http://www.students.jku.edu/international/content/e15/e258/e263/index_eng.html)
- A personal **application letter containing a CV** and all documents which should be sent to our CAO,

Ms. Betina Curtis  
Softwarepark 21/Top 01  
A-4232 Hagenberg  
[bcurtis@isi-hagenberg.at](mailto:bcurtis@isi-hagenberg.at)

Any **questions** should be directed to [bcurtis@isi-hagenberg.at](mailto:bcurtis@isi-hagenberg.at) or to [bruno.buchberger@jku.at](mailto:bruno.buchberger@jku.at).



## Tuition, Living Costs and Fellowships

**Tuition** for the specialization year is **Euro 8500**.

The tuition covers:

- all lectures
- extensive tutoring and guidance by the advisors
- use of all facilities relevant to one's studies (internet, laboratory, libraries etc.)
- exams
- issuance of degree diploma

**Living costs** for a student in Austria amount typically to about **550 up to 700 Euro** per month. They consist of:

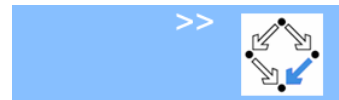
- Dormitory room:  
Single room in Hagenberg at 282 Euro per month plus 43 Euro insurance per year. Price includes furniture, bed sheets, towels, Internet, cleaning. (See also homepage: [www.studentenwerk.at](http://www.studentenwerk.at))
- Meals, toiletries etc.: 250 – 300 Euro per month
- Text books: Some courses offer lecture notes that students can download from the internet, while some courses rely on textbooks, most of which are purchased by our library. Remaining costs for the student: approx. 20 Euro per month.

### Fellowships:

For very good or excellent students a **variety of fellowships** covering tuition and/or living costs is available, offered by Austrian and international industrial companies and governmental and scientific institutions. However, we assume that **all students** also make a serious effort to **raise their own funds** for supporting their studies.

Many of the fellowships are typically established by Austrian and International companies. **These fellowships cover tuition or living costs**, or, in exceptional cases, both. In the case of company-sponsored fellowships, the student should be prepared to choose as his specialization topic a subject proposed by or determined in cooperation with the sponsoring company. Also, in this case, the master's thesis should concentrate on the topic specified in cooperation with the company.

Examples of specialization areas that reflect the areas of expertise of the current faculty of the **JKU International Master's Program in Informatics** and partly also the interests of the sponsoring institutions:

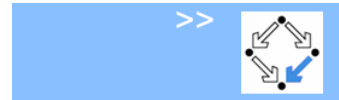


***a. Specialization areas in business applications:***

- quality management
- e-commerce
- e-government
- IT governance
- e-business
- supply chain management
- logistics
- finance and asset management
- e-banking systems
- complexity management
- make or buy decision management
- application service providing
- e-learning
- transportation systems
- geographical information systems
- weather forecasting systems

***b. Specialization areas in the methodology of informatics:***

- machine learning
- artificial intelligence
- symbolic computation
- numeric computation
- discrete computation
- algorithm design
- cryptography and coding
- mathematical modeling
- optimization
- robotics
- automated reasoning
- computational intelligence
- web engineering
- semantic web
- knowledge engineering
- data mining
- pervasive computing
- embedded systems
- context and local based services
- mobile computing
- quantum computing
- DNA computing
- bioinformatics
- proteomic
- genomics
- computer graphics
- computational perception
- computer linguistic
- medical informatics
- software and hardware verification



# • Appendix 1:

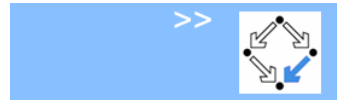
## Detailed Description of the JKU International Master's Program in Informatics

### Mission Statement

The **JKU International Master's Program in Informatics** is unique: It combines 40 years of experience in

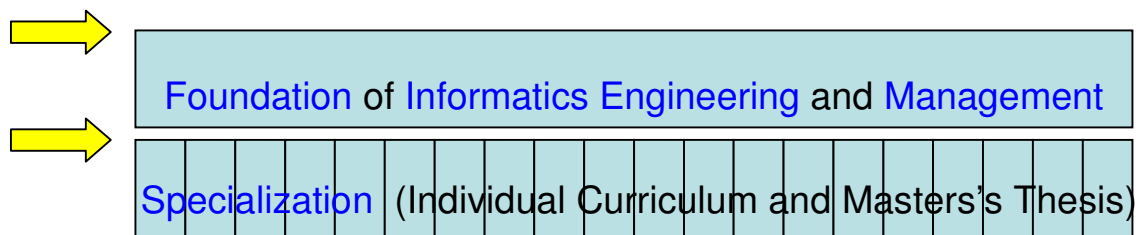
- basic and applied **research** in informatics (and related subjects)
- international **PhD programs** in informatics (and related areas)
- **master's program** in informatics (and related areas)
- **bachelor's program** in informatics (and related areas)
- **technology transfer** and cooperation with companies
- building up technology centers (notably **the Softwarepark Hagenberg**)


and condenses this experience in a master's program, **completely taught in English**, for international students from all over the world for educating informatics experts who can also act responsibly as leaders in companies, organizations and society.



## Structure of the JKU International Master's Program in Informatics

The **JKU International Master's Program in Informatics** has the following structure:



Two possible entry points: 

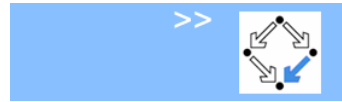
Each year offers and requires **40 credit hours** (= approximately 60 ECTS points) of course work (including the master's thesis).

### ***The First Year***

**The first year** of the **JKU International Master's Program in Informatics** aims at providing in-depth basics in **informatics engineering and management**. It starts from the assumption that students were exposed to the practical contents of informatics as provided by a typical bachelor of informatics or a related field and focuses on the aspect of **foundation** and, at the same time, the aspect of **management and leadership**. The syllabus for the 1<sup>st</sup> year is identical for all students and consists of the courses given below.

### ***The Second Year***

**The second year** of the **JKU International Master's Program in Informatics** provides a **broad spectrum of possible specializations** in topical areas of informatics. At the beginning of the second year, after a detailed analysis and discussion, for each student a specialization area and possible master's thesis subject is determined. **An academic supervisor is assigned and an individual curriculum is composed for the student**, which has to be approved by the Master's Program Committee. The individual supervisor is guiding the student through the course work and, most importantly, is supervising the work on the master's thesis. Altogether, more than 100 faculty members (among them more than 30 full professors) are available as academic supervisors for the **JKU**



**International Master's Program in Informatics.** In addition, every year, a couple of international visiting professors contribute to supervising our students. A list of specialization areas reflecting some of the research areas of the current JKU faculty is given in the description of the specialization year.

### ***Entry points:***

Students can enter the **JKU International Master's Program in Informatics** at **the beginning of the first year** and stay in the program for either one or two years. Students can also enter the program **at the beginning of the second year** ("**the Specialization Year**") and consume the specialization year (second year) including writing of the master's thesis.

**In the academic year 2008/09 the focus will be on organizing the second year.**

## **Prerequisites for Entering the Program**

### **For entering at the beginning of the first year:**

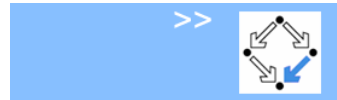
- A **bachelor** degree in informatics or any related subject (e.g. computer science, business informatics, computer mathematics, information and communication technology, electrical engineering)
- Fluency in **English**.
- **Austrian visa**: We will help in obtaining the necessary student's visa.

### **For entering at the beginning of the second year:**

See list of prerequisites at the beginning of this document.

## **The Master's Degree**

Students who subscribe to the entire **JKU International Master's Program in Informatics** (1<sup>st</sup> and 2<sup>nd</sup> year including master's thesis and master's exam) as well as students who were accepted to as well as subscribe to the second year (including master's thesis and master's exam) will obtain the degree of "**Master of Science in Informatics**" conferred by the accredited **Johannes Kepler University, Linz**.



## Careers

Graduates of the of the **JKU International Master's Program in Informatics**

- if **returning to the their home countries** will be well prepared to be employed **in top level jobs** in the ICT industry, in the numerous fields of ICT application in private business or in governmental organizations,
- or are **welcome to stay in Austria** or other EU countries to work in **important positions** in their area of specialization,
- or can continue **to study in the framework of a PhD program** either at JKU or any other university that offers PhD programs.

A **special doctoral program**, centered around the internationally renowned RISC PhD program, is **offered by the JKU institutes located at Softwarepark Hagenberg**. This is a great opportunity for **graduates of the JKU International Master's Program in Informatics to continue their studies**.

## Costs of the Study, Application, Questions

The tuition for one year of the **JKU International Master's Program in Informatics** is 8500 Euro.

**Living costs** in Austria for a student are approximately 500-700 Euros per month depending on the standard of living.

**Fellowships** for tuition and/or living costs are available for outstanding and excellent students. However, typically, students are supposed to make also their own effort for being able to cover tuition and/or living costs.

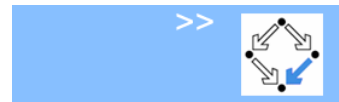
**Applications** for the academic year 2008/09 should be sent as soon as possible, but no later than **April 30, 2008**, to

Ms. Betina Curtis, Chief Administrative Officer  
[bcurtis@isi-hagenberg.at](mailto:bcurtis@isi-hagenberg.at)

Softwarepark 21, 0/1  
A-4232 Hagenberg  
Austria

Any **questions** should be directed to [bcurtis@isi-hagenberg.at](mailto:bcurtis@isi-hagenberg.at) or to [bruno.buchberger@jku.at](mailto:bruno.buchberger@jku.at)

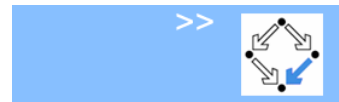
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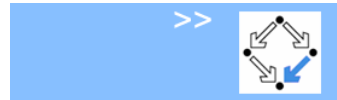
## The Unique Features of the JKU International Master's Program in Informatics

The **JKU International Master's Program in Informatics** is **unique** in a number of ways and provides elite education for its students:

- The **Johannes Kepler University** (JKU) [www.jku.at](http://www.jku.at) counts **40 years of experience** in basic research, applied research, international PhD program, master's and bachelor programs, and technology transfer (cooperation with the industry) in the area of informatics and related areas (computer science, business informatics, computer mathematics, etc.). There **are over 4000 students of informatics** and related subjects at JKU.
- Some of the JKU departments **have worldwide reputation in research** and PhD training (e.g. the Research Institute for Symbolic Computation [www.risc.uni-linz.ac.at](http://www.risc.uni-linz.ac.at) of which a recent US National Science Foundation report says: "There is no comparable institute in the United States.")
- **The JKU International Master's Program in Informatics** is operated in close **cooperation with the University of Applied Sciences** in Hagenberg, which is a JKU spin-off specializing in Applied Informatics. This brings additional faculty with particular experience in applied subjects into the international master's program.
- **Over 100 faculty** (among them over 30 full professors) of the JKU and the University of Applied Sciences are available for teaching courses and supervising master students in the framework of the **JKU International Master's Program in Informatics**. In addition, each year, a couple of visiting professors from reputed universities around the world are available as supervisors for our International Master's students.
- **The JKU International Master's Program in Informatics** is integrated into the **Softwarepark Hagenberg** [www.softwarepark.at](http://www.softwarepark.at), another spin-off of JKU (in fact of RISC, the Research Institute for Symbolic Computation of the JKU). The Softwarepark Hagenberg embraces 8 research institutes, the University of Applied Sciences, and **over 40 companies with altogether 1000 researchers and developers**. This allows our students to **build up a unique professional network** already during their studies.
- The curriculum of **JKU International Master's Program in Informatics** contains a couple of **unique courses**, among them a special creativity training based on predicate logic (the "**thinking course**"), practical training in **management**, a new approach to the **practice of mathematical modeling** and problem solving course based on interactive mathematical systems, a **unique condensed top-down presentation of the foundation of informatics engineering and management**.



- In addition to deepened training in informatics, the **JKU International Master's Program in Informatics** offers special facets that aim at preparing our students for **leadership**:
  - the course "**Acting in Society**" opens the awareness of the students for their role and responsibility in today's regional societies and the global society;
  - by studying in the context of the Softwarepark Hagenberg, our students can study how **modern technology centers** are organized and **how innovation is brought about**;
  - by our "**Experience Europe**" program, which accompanies the **JKU International Master's Program in Informatics**, our students get first-hand and systematic experience about one of the important cultural and economic regions in the world;
  - our students can enjoy **a truly international community with their fellow students** which is an important basis for future leadership in a global world.
- The first year of the **JKU International Master's Program in Informatics** is taught in a **block system**: The individual courses are taught as consecutive units ranging from a couple of days to a couple of weeks. Each course is finished (including study and exam) before the next one starts. This allows students to **concentrate on one subject matter at a time** and also facilitates **proceeding to increasingly higher levels of understanding**. Also, it allows to **integrate faculty from outside** more easily into the program.

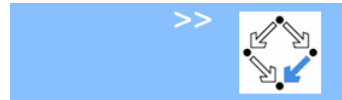


## Appendix 2:

**Details of the Curriculum** (for students entering in the first year)

### ***Courses in the First Year of the JKU International Master's Program in Informatics***

- **English** as Working Language (taught by a Native English Speaker)  
(Practical training: 1 credit hour, 1.5 ECTS points)
- **Professional Working Skills:**  
(Practical training: 4 credit hours, 6 ECTS points)
  - Training of Formal Thinking and Problem Solving
  - Working with the Literature
  - Oral and Written Presentation
- **Management** of Project, Companies, and Organizations  
(Lecture: 2 credit hours, 3 ECTS points; assignments: 3 credit hours, 4,5 ECTS points.)
- Acting in **Society**  
(Lecture: 1 credit hours; seminar: 1 credit hour; practical training: 3 credit hours, 4.5 ECTS points.)
  - Approaches to Society
  - International Organization
  - Personality and Society
  - Experience Europa
- **Logico-Mathematical Foundation** of Informatics  
(Lecture: 2 credit hours, 3 ECTS points; practical training: 3 credit hours, 4.5 ECTS points.)
  - Mathematical Modeling Using Mathematical Software Systems
  - Limitations to Computability and Efficiency
- **Foundation of Informatics Engineering and Management**  
(Lecture: 12 credit hours; assignments: 6 credit hours, 9 ECTS points; seminars: 2 credit hours, 3 ECTS points.)
  - Data Engineering and Management
  - Software Engineering and Management
  - Communication Engineering and Management
  
  - Information Engineering and Management
  - Knowledge Engineering and Management
  - Service Engineering and Management



## ***Courses in the Second Year of the JKU International Master's Program in Informatics***

See the description at the beginning of this document.

Of course, students who took part in the first year of our International Master's Program need not take part in the block courses in September, listed at the beginning of this document.

## **Appendix 3:**

### **Information on the JKU, Austria, Europe**

For JKU, see [www.jku.at/](http://www.jku.at/)

For Austria, see <http://en.wikipedia.org/wiki/Austria>

For Europe, see <http://en.wikipedia.org/wiki/Europe>



## Appendix 4:

### Photos of the Softwarepark Hagenberg, the JKU Campus, and Linz



View of Hagenberg (dormitories to the left, castle in front)



Lecture Halls at Hagenberg



Lecture Halls at J.K. University, Linz