Guideline Master Computer Science University of Siegen

Version: January 25, 2017

1   General Information

- **We are currently setting up the new Master program, so we apologize for any inconvenience due to not yet fully established processes and information.**

- **Enrollment to the English computer science master is possible only in the winter term.**

- **The online application portal is open now:**

  https://unisono.zv.uni-siegen.de/

- **Time line:**
  - **April 29th 2017:** Deadline for online applications
  - **May 20th 2017:** Deadline for the arrival of the following hard copy documents in Siegen[1]:
    - Certificate of final Bachelor (and Master if appropriate) university degree
    - Transcripts of records for your final university degree(s)
    - English language skill certificate (TOEFL, IELTS, computer based or internet based)

    Important remarks: Please wait until we explicitly ask you to hand in your documents. Attestation can be done by the issuing institute (e.g. your university), or by a public notary or lawyer.

- The Master program in Computer Science at the University of Siegen is a **bilingual** program, where relevant courses are offered in English. A **bilingual course** is held in English, whenever a participant requires English as teaching language.
  The following **focal areas** can be studied by attending exclusively English courses:
  - **Embedded Systems**
  - **Visual Computing**

- The international master program in computer science is a consecutive study program. It builds upon a bachelor's program that conveys the necessary skills and expertise for the master program based on **the content of the Bachelor program in Siegen**. Thus, after your application, we will **evaluate your transcripts of records** in order to ensure that you have the necessary skills and expertise for the master program in one of the two study focus areas (i.e., embedded systems or visual computing). **A telephone interview** with each shortlisted applicant will clarify any uncertainties about the required skills and expertise for the master program.

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[1] Certified copies of the original documents are required; **do not send any original documents**, as we cannot send them back. If your documents are not in English or German, a certified English or German translation must be provided instead. Concerning Indian applicants: All mark sheets and degree certificates (transcripts) must be sent through the proper channel (certified by the issuing institution).

- **Financial requirements:** No tuition fees are charged for this Master course, however the following approximate living costs are to be expected and need to be covered by the student's own financial resources:
  - Enrolment fees (currently 245 € per semester)
  - Compulsory health insurance (approx. 85.00 € per month)
  - Accommodation (approx. 300 € per month plus a deposit of approx. 600 €)
  - Living expenses (approx. 450 € per month)
  - Residence permit (approx. 80 €)

  Please note that the University of Siegen does not offer any scholarships.

2 Requirements for Application

2.1 General Requirements

- A **Bachelor in Computer Science** (at least 6 semesters), including theoretic and fundamental courses regarding Algorithms and Data Structures, Object-oriented Programming (C++, Java) and Theoretic Foundations of Computer Science.
- **English: We require TOEFL iBT: min. 87** or **IELTS: Band 5-6.**

2.2 Focal Area specific requirements

- **Embedded Systems:** We expect solid knowledge in the following disciplines
  - Digital design and computer organization
  - Operating systems
  - Computer networks
  - Programming
- **Visual Computing:** We expect solid knowledge in the following disciplines
  - Linear Algebra and Vector Calculus
  - Programming in C++
  - Computer Graphics (in theory and programming practice)
  - Image Processing (in theory and programming practice)

3 Structure of the CS Master

- The Computer Science Master is a 2-year (four semesters) Master program with 120 ECTS[2] credit points (CP).
- The **overall structure** of the Master course comprises of the following components:
  - **Core Subjects (total: 20 ECTS):** 4 courses out of 9 courses (5 ECTS each) need to be chosen.
  - **Specialization Courses (total 45 ECTS):** These courses are related to one of the focal areas, i.e., Embedded Systems or Visual Computing.
  - **Seminar (5 ECTS):** Includes the following interrelated activities:
    - giving a presentation on a prescribed topic;
    - preparing a written report on the content of the presentation;

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[2] European Credit Transfer Systems: http://ec.europa.eu/education/ects/ects_en.htm

- participating in all seminar presentations and in discussions about the presentation.
  - o **Project Group (20 ECTS):** A project group serves to teach typical working methods for handling larger scale projects. It prepares for later professional practice and includes aspects of division of labor, subject specific knowledge and team work.
  - o **Master Thesis (30 ECTS):** The thesis is intended to show that the candidate is able to independently work on a scientific problem in accordance with scientific methods within a prescribed time limit.
- **Core Subjects:** The following courses are offered, from which 4 have to be chosen (5 ECTS each, in total 20 ECTS).
  - o **Bilingual courses:**
    - Computer Graphics II
    - Embedded Systems
    - Computer Architecture II
    - Parallel Processing
    - Algorithms I
  - o **In addition,** the following (non-compulsory) German courses are offered:
    - Logic II
    - Database Systems II
    - Computer Networks II
    - Software Engineering II
- **Specialization Courses, focal area Embedded Systems (ES):** Out of the following options, courses with in total 45 ECTS have to be selected. Each course has 5 ECTS.
    - Information and Communication Security (2 courses)
    - Communication Engineering
    - Embedded Control
    - Estimation Theory
    - Information Security (2 courses)
    - Storage Technologies, Stochastic Models
    - Telematics (2 modules)
    - Digital Communication Technology (2 courses)
- **Specialization Courses, focal area Visual Computing (VC):** In total 45 ECTS have to be selected.
  - o **Mandatory courses:** The following bilingual courses are mandatory for the focal area VC (5 ECTS each, in total 20 ECTS):
    - Computer Graphics III
    - Statistic Learning Theory
    - Pattern Recognition
    - Numerical Foundations in Simulation
      Alternative to this course either of the following German courses can be taken (please note, that "Numerik I" has 10 ETCS, i.e., taking this course reduces the ECTS-workload for the optional courses to 15 ECTS):
      - Numerik I (10 ECTS; course provided by the Department for Mathematics)

- Einführung in numerische Methoden und FEM (5 ECTS; course provided by the Department for Mechanical Engineering)
  - o **Optional courses:** Out of the following options, courses with in total 20 ECTS have to selected:
    - ▪ **Bilingual Courses** (5 ECTS, if not specified)**:**
      - Scientific Visualization
      - Computer Graphics IV
      - Virtual Reality
      - Machine Vision
      - Variational Methods for Computer Vision (10 ECTS)
      - Ubiquitous Computing
    - ▪ **In addition,** the following (non-compulsory) German courses are offered: (5 ECTS each):
      - Digital Image Processing II
      - Distributed Computing
      - Client-Server Programming
- Figure 1 shows a typical study schedule for the Computer Science Master. Note, that there is no guarantee that a specific selection of courses can be studied within this schedule, but some adaptations may be required.

	1. Semester	2. Semester	3. Semester	4. Semester
5 ECTS	Core Modules	Project Group		Master Thesis (including defense)
5 ECTS				
5 ECTS		Core Module	Specialization Modules	
5 ECTS	Specialization Modules	Seminar		
5 ECTS		Specialization Modules		
5 ECTS				

∑ 30 ECTS

Figure 1 Suggested study schedule for the Computer Science Master.

4   Further Information

- For any further question not answered in this document, please contact master-cs@uni-siegen.de.
- English website of the Master: www.master-cs.eti.uni-siegen.de

- [General Rules for exams in the degree courses of the Department of Electrical Engineering and Computer Science](#)
- Website of the Department of Electrical Engineering and Computer Science: www.eti.uni-siegen.de
- Website of the office for International Student Affairs: www.uni-siegen.de/start/internationales/?lang=en