Introduction Master Computer Science

Summer Semester '23

Academic Advisor for Master Computer Science
Florian Frohn

Computer Science

RWTH AACHEN UNIVERSITY

Table of Contents

Computer Science

RWTH AACHEN UNIVERSITY

1/11) Masters' Goals and Overview

Goals of the Master Program

- In-depth education in Computer Science
  - Broad range of elective subjects, mostly research-oriented

- Greater independence
  - Seminar, Software Lab, Master's thesis

- More responsibility for future job
  - Leadership qualities
  - Less implementation

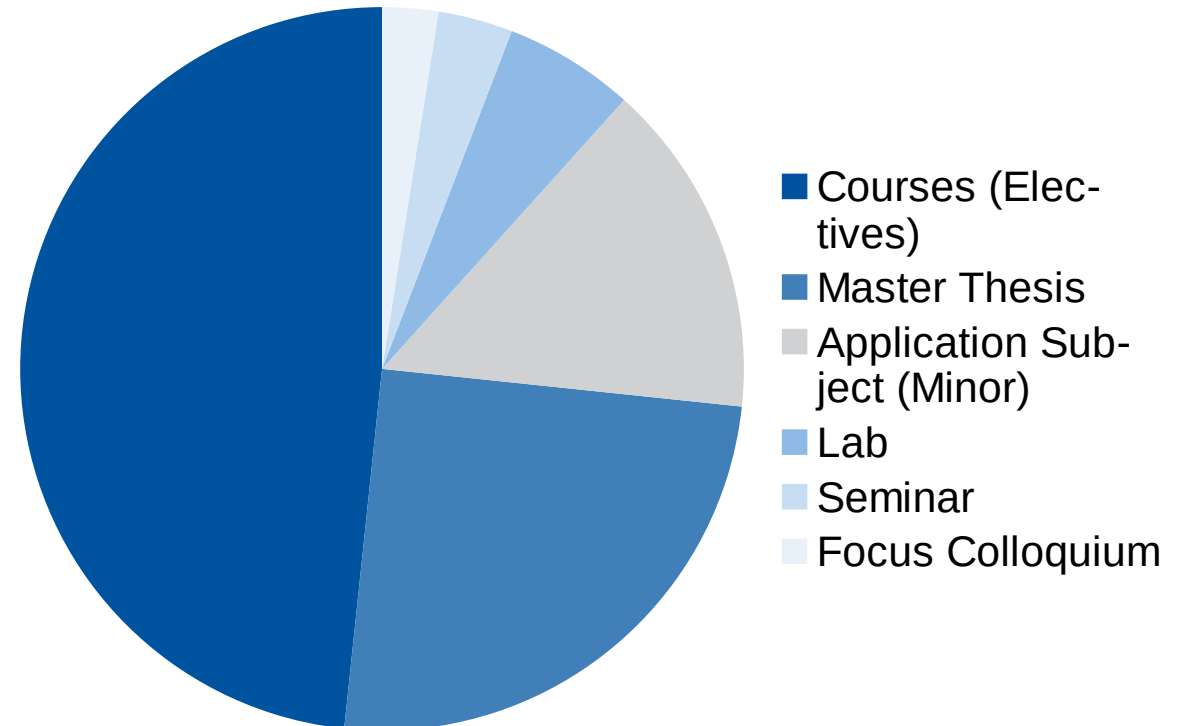- Qualification for PhD

Overview of the Master Program

- Comprises 120 ECTS credits (Credit points, Leistungspunkte) in 4 semesters (Regelstudienzeit)
  - ECTS credits are reflecting a course's workload
  - 30 Credits are full workload for one semester

- Only few mandatory achievements
  - No fixed study plan
  - No mandatory courses, freedom of choice – with restrictions
  - Large responsibility for own studies!

Overview of the Master Program

Courses (electives)   57 – 63   Credits
1 Seminar   4   Credits
1 Software Lab   7   Credits
Focus colloquium   3   Credits
Master's thesis   30   Credits
Minor (Application Subjects)   14 – 18   Credits*

_____

120 Credits

*exact number depends on chosen subject

- ■ Courses (Electives)
- ■ Master Thesis
- ■ Application Subject (Minor)
- ■ Lab
- ■ Seminar
- ■ Focus Colloquium

Restrictions on Choosing Electives

Theoretical Computer Science	Software and Communication	Data- and Informationmanagement	Applied Computer Science
12 CP – 35 CP	≤ 35 CP	≤ 35 CP	≤ 35 CP
Algorithms	Software Engineering	Databases	Speech Recognition
Logic	Internet Technologies	Data Science	Computer Graphics
Verification	Distributed Systems	Cryptographie	High Performance Computing
Modelling	Embedded Systems	Artificial Intelligence	Machine Learning
...	...	...	...

- Minimum of 12 credits for electives in theoretical computer science

- Maximum of 35 credits per field
  - Note: Excluding your seminar, software lab and focus colloquium
  - Hard limit: If you exceed 35 credits, the last exams will not be counted!

00011
0010
1110
010

Computer Science

RWTH AACHEN UNIVERSITY

Possible Study Plan

- This plan is just one possibility.
  - Plan ahead!
  - Not all courses are offered each semester, some require early registration

1. Semester	3 Electives, Theory Elective Start Minor Course on Scientific Integrity	30 CP
2. Semester	2 Electives, Theory Elective Seminar, Focus Colloquium Continue Minor	31 CP
3. Semester	3 Electives Software Lab Finish Minor	29 CP
4. Semester	Master Thesis	30 CP

Overview of the Master Program

- Sometimes the courses don't add up to 120 Credits exactly. You need at least 120 Credits.
- 18 Credits in Minor is a soft limit. You need at least 18 CP in most cases. Details on minors later.
- All other limits are hard limits. Courses getting you over the limit will not be counted.
- All courses fully contribute to your overall grade or not at all. Courses will not be counted partially, if you hit a limit.

Courses (electives)	57 – 63	Credits
1 Seminar	1	Course
1 Software Lab	1	Course
Focus colloquium	1	Exam
Master's thesis	1	Thesis
Minor (Application Subjects)	14 – 18	Credits
	_____	
	120	Credits

2/11) Elective Courses

Courses (Electives)

- One elective course usually comprises
  - Lecture
  - Exercise, maybe in groups
  - Usually V3 Ü2 or V3 Ü1, 6 Credits
    - V3 = 3 hours of lecture per week
    - Ü2 = 2 hours of exercise per week
- Examined by final exam at the end of the semester
  - Two exams per year, usually both at end of the semester
  - In some minors: one exam per semester
  - Written or oral, decided by teachers
  - Teachers can decide on exam admission criteria!
    - Hand in solutions which are corrected by teachers, achieve minimum score
    - Pass a presence exercise / midterm exam
    - …
  - Note: exam admissions only valid for one year!

RWTHonline

- https://online.rwth-aachen.de
- Campus management system of RWTH Aachen University
  - Overview on courses offered per semester
  - Overview about all courses (modules) assigned with a study program
- Study management for students
  - Registration for courses & exams
  - Overview of study status & grades
  - …
- Manuals: https://wiki-intern.rwth-aachen.de/display/RD/FAQ+for+Students

Registering for Elective Courses

- via RWTHonline
- Getting access to all learning material
  - Mostly via RWTHmoodle learning rooms
- Course dates are filled in into your internal calendar
- You are put on the mailing list for the course
- Note: no unified registration periods!

Always attend first lecture of a course to get organizational information!

Registering for Elective Courses

If you are not sure whether you would like to take the course, you can add the course group to your favorites. Click on the star next to the group title and then BACK. Your bookmarked dates will now appear in your calendar, although you are not yet registered on the course.

Registering for Elective Courses

Selecting the SPO context.
Only choose the "free registration" option if no SPO context is available.
Places on courses with limited capacity will e.g. often be preferentially allocated to registrations with SPO context.

3/11) Exams

Registering for Exams

- Registering for lectures/exercises only allows you to participate in a course
- Additional registration for exam required!
  - Separate registrations for first and second exam configured
    - Only possible to register for one date
    - In doubt, register for the first one

- Registration period
  - Standard for first exam: 1st April – 15th July
  - Standard for second exam: until 7 days before exam date
  - Carefully check periods for each course! Teachers can modify them!
  - Do not forget registration! Late registrations generally not possible!

Dates may be different!
Always check!

(De-)Registration for Exams

- Withdrawal of exam registration possible
  - Until three working days before the exam date

- Not taking an exam because of illness
  - Doctor's certificates must be issued on the day of the exam the latest
  - Certificate must indicate that you cannot take exams on that day („not fit for work"-certificates are not sufficient!)
  - Must be handed in at ZPA at latest on the third working day after the respective exam
    - Just informing the professors is not sufficient. You need to submit the medical certificate to the ZPA!
  - ZPA withdraws your registration
  - Official regulations: https://www.rwth-aachen.de/go/id/eir/lidx/1

- Missing a registered exam without medical certificate
  - Counts as fail

Deregistering for Exams

Introductory Event Master Computer Science Summer Semester 2023 | Florian Frohn | Academic Advisor Master Computer Science
03.04.2023

Repeating Exams

- Participation in 2nd exam
  - If failing 1st exam, withdrawing registration or being ill
  - New registration required!
    - Possible only after results of 1st exam are published
  - Remember: every exam has to be actively registered for!

- You can take each exam at most three times
  - Exam plus two repetitions
  - When failing three times, you cannot take that course any more

4/11) Seminar and Lab

Seminar and Software Lab

- Seminar: Independent elaboration of a topic from existing literature
  - Literature survey, writing a paper & giving a talk
  - Teachers offer seminars on various topics of their research directions
  - Typically 10 – 30 participants

- Software Lab: Solve practical tasks
  - No industry internships!
  - Development, implementation, constructing prototypes, …
  - Teachers offer labs on various topics
  - Typically 10 – 20 participants, teamwork

- You cannot take another Seminar or Lab, respectively, after passing it once
  - Neither as a replacement for electives nor as voluntary extra course
  - The study plan in the examination regulations is outdated and misleading!

- At most three tries possible
  - Failing three times ends your studies!

Registration for Seminar and Software Lab

- Distribution of places independent of RWTHonline
  - Central distribution system for all places in seminars and labs
    - Registration via: https://supra.informatik.rwth-aachen.de/
  - Online registration in June/July for winter semester and in December/January for summer semester
  - After places' assignment, you might be asked to register for the assigned seminar/lab via RWTHonline, or the teacher registers you
  - Process announced in kickoff-meeting

- Withdrawal possible until three weeks after distribution of topics
  - Deregister in RWTHonline and announce withdrawal to teacher
  - Process announced in kickoff-meeting

Excursus: Voluntary Additional Courses

- Additional lectures / seminars / labs can be taken as voluntary courses
  - Not only Computer Science courses, but arbitrary courses offered at RWTH Aachen University
  - You still cannot take the same module multiple times (so no second computer science seminar or lab, because they are all one module)
  - Grades will be on Master's certificate, but they are not considered for your degree and for your final grade

- Registration:
  - Hopefully via RWTHonline
  - If it does not work, via ZPA and the Examiners
  - After registration, ZPA must be informed that this course is taken as a voluntary course

5/11) Focus Colloquium, Course on Scientific Integrity

Focus Colloquium

- Oral exam on coherent topics
  - Courses with an amount of 12 – 18 Credits in total
  - At least three courses (may include seminar or lab)
  - Can be courses in which you already have done an exam (but does not have to)

- Assessment: 3 Credits
  - Weight for final Master's grade: 12 Credits (counted 4-fold)
  - … while all other modules are counted corresponding to their credits

- How to find a topic and an examiner?
  - Plan ahead! Think about possible combinations when choosing electives.
  - Contact professors where you did multiple courses already
  - Individual examiners might only have limited exam dates available! So, schedule it in time.

- Registration:
  - Discuss courses and examination date with examiner
  - Examiners can decide if a specific combination is allowed if it fulfills the formal requirements
  - Registration in RWTHonline via examiner

Course on Scientific Integrity

- Online Course on Scientific Integrity
  - Aspects of scientific integrity
    - Honesty, research goals, principles of good scientific conduct
    - Research ethics, social responsibility, diversity, conflicts of Interest, handling research data
  - How to safeguard scientific integrity?
  - How to handle scientific misconduct if encountered?

- Mandatory for all Master's students enrolled in Winter 2020/21 or later
  - If you already passed a course focused on scientific integrity in your previous studies, you don't have to take it again.
  - Must be passed before you can register for your Master's thesis.
  - Registration via RWTHonline
  - More information at https://www.rwth-aachen.de/go/id/mylsw/lidx/1/

6/11) Master's Thesis

Master's Thesis

- Typically last part of your studies

- Independent work on a topic with methods learned during the course of studies
- Practical work, written thesis, talk

- Master's thesis is handed out (exclusively) by a Computer Science professor
  - Look on the websites of chairs, contact professors and research assistants to find a topic
  - Topics from other departments or the industry will not be accepted
    - Please don't suggest topics from the industry or other department to computer science professors.
    - Exception: Professors with a cross assignment to computer science.
  - Industry-cooperation is possible if intended by the supervising professor

- Thesis is evaluated by two reviewers (= professors)
  - Grade is the average of both grades.

- Thesis can be repeated once.
  - If you failed the thesis. You must register for a new thesis within three semesters.

Master's Thesis

- Assessment: 30 Credits (one full semester)
  - 27 Credits for Thesis
  - 3 Credits for Talk

- Submission Deadline: 6 months from registration

- Registration
  - You must have achieved at least 60 credits to register the thesis
  - Requirements (Auflagen) have to be passed before registration
  - Passed course on Scientific Integrity
  - Topic is handed out by supervising professor (primary reviewer)
  - To register, file a request to the examination board
    - https://pa.informatik.rwth-aachen.de/application/register-thesis
  - Examination Board informs you about your submission deadline

00011
0010
1110
010

Computer
Science

RWTH AACHEN
UNIVERSITY

7/11) Minors

Application Subjects (Minor)

- Standard minors
  - Business Administration (BWL)
  - Electrical Engineering
  - Mathematics
  - Philosophy
  - Mechanical Engineering
  - Medical Sciences
  - Physics
  - Biology
  - Chemistry
  - Psychology
  - … and possible to apply for other subjects

18 ECTS

16 ECTS

14-18 ECTS
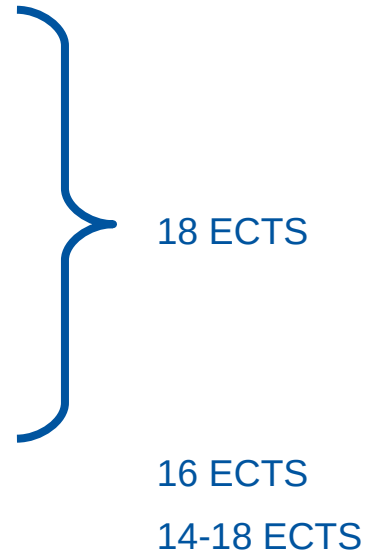
- If you had no minor in your Bachelor, or you switch minor:
  It is your responsibility to acquire the required previous knowledge otherwise taught in the minor of the Bachelor
  - e.g., get and study using the learning material of the Bachelor courses
  - or attend the Bachelor courses
  - or use external resources
  - Usually the workload is the equivalent to additional 8 – 12 credits (*no* proof or exams required)

8/11) Requirements

Requirements (Auflagen)

- Listed in approval notice

- Automatically added to your Study Overview (curriculum support)

- Need to be passed before registration of Master's thesis

- Registration in RWTHonline

- Special case: elective requirements like „Elective course from Theoretical Computer Science"

  - Registration at ZPA

  - Appear in RWTHonline only after registration

00011
0010
1110
010

Computer
Science

RWTHAACHEN
UNIVERSITY

9/11) Which Courses Should I Take?

Presentation of Elective Course
Videos available online

https://sc.informatik.rwth-aachen.de/de/wahlpflicht/

Which Courses should I take?

- Browse RWTHonline

Introductory Event Master Computer Science Summer Semester 2023 | Florian Frohn | Academic Advisor Master Computer Science
03.04.2023

Which Courses should I take?

- Browse list of courses by semester

Introductory Event Master Computer Science Summer Semester 2023 | Florian Frohn | Academic Advisor Master Computer Science
03.04.2023

Which Courses should I take?

Which Courses should I take?

Node filter-Name		Part of the Curriculum	Rec. Sem. (W/S)	Credits	Duration	WF
− 🟨 [2009] Computer Science		Yes		120	4	1
− ▬ Electives		Yes				1
− ▬ Theoretical Computer Science		Yes				1
+ ◆ [1113605] Algorithmic Model Theory II	📖	Yes		4	4	1
− ◆ [1211981] Advanced Automata Theory	📖	Yes		6	5	1
− ● [121198101] Exam Advance Automata Theory		Yes	1. / -	6	0	1

Examination(s) in academic year ◀ 2019/20	Part	Lecturer (Assistant)	Status	Place (1st session)	Time (1st session)
12.PV21965 20S 0SWS L Advanced Automata Theory	Ⓟ		BF		

− ● [121198102] Exercises Advanced Automata Theory			Yes	1. / -	0	2	1

Examination(s) in academic year ◀ 2019/20	Part	Lecturer (Assistant)	Status	Place (1st session)	Time (1st session)
12.02776 20S 2SWS E Advanced Automata Theory	Ⓣ Ⓟ	Löding C	GP		

− ▲ Lecture Advanced Automata Theory			Yes	1. / -		3	1

course(s) in academic year ◀ 2019/20	Part	Lecturer (Assistant)	Status	Place (1st session)	Time (1st session)
12.07055 20S 3SWS L Advanced Automata Theory	Ⓣ	Löding C	GP		

+ ◆ [1212647] Advanced Model Checking	📖	Yes		6	5	1
+ ◆ [1212657] String Processing Algorithms and Data Compression Techniques	📖	Yes		6	3	1
+ ◆ [1216860] Algorithmic Foundations of Datascience	📖	Yes		6	5	1
+ ◆ [1217538] Computational Geometry	📖	Yes		6	4	1
+ ◆ [1217537] Algorithmic Learning Theory	📖	Yes		6	5	1
+ ◆ [1113583] Algorithmic Model Theory I	📖	Yes		8	6	1

- If you don't see courses or examinations below an offer node (green circle) or exam node (red triangle) the module is not offered this semester.
- You can click on the arrows next to the year to see when it was last offered

Which Courses should I take?

- Or study research groups on Computer Science web pages
- http://www.informatik.rwth-aachen.de/

Which Courses should I take?

- Introduction to elective courses: https://sc.informatik.rwth-aachen.de/de/wahlpflicht/

- RWTHonline: https://online.rwth-aachen.de/

- Group websites: http://www.informatik.rwth-aachen.de/

- Unofficial info page of one of our students: https://rwthoffline.de/

- At the beginning of the semester: Visit diverse courses to get an impression!

- Mentor program

00011
0010
1110
010

Computer
Science

RWTH AACHEN
UNIVERSITY

Mentor Program

- Mentor discussion with a Computer Science professor in small groups

- Registration required

- In particular recommended if you did your Bachelor elsewhere

- http://www.informatik.rwth-aachen.de/go/id/oiqu/lidx/1/

10/11) Staying Abroad

Stay Abroad: Exchange Semester

- Possible during Master's studies: Exchange semester at one of our partner universities
  - New environment, new culture
  - Other teaching culture

- No extension of study duration (... If everything works well!)
  - Transfer of credits achieved at partner university
    - Note: make sure that credits can be transferred before your stay!
  - Leave of absence possible

- When to do a stay abroad?
  - Anytime, in general
  - But coordinate with your minor

Start Planning Now!

- Discover possible destinations
- Country, teaching language, course offerings

- Knowledge of teaching language required
- Take language courses soon

- More information:
  - International Office (SuperC):
    - http://www.rwth-aachen.de/cms/root/Studium/Im-Studium/Internationales/~ehh/Outgoing/?lidx=1
  - Dedicated Study Advising:
    - https://www.comsys.rwth-aachen.de/teaching/outgoings/

11/11) Mailinglist, Contacts, Website, ...

Finding Information Online

- Mailing List
  - msinf@lists.rwth-aachen.de
  - Important dates and events, registration for seminars and practicals, ...
  - No subscription needed

- Website of M.Sc. Computer Science
  - https://sc.informatik.rwth-aachen.de/de/studium/master/informatik/
  - Slides
  - FAQs
  - Contact information of advisors
  - Structure of the M.Sc. Computer Science
  - …

- Online System of the Examination Board
  - register thesis
  - transfer of credits
  - get help to find a thesis
  - ...

Contacts

- General contacts
  - Central Study Advising: general and interdisciplinary questions, psychological counseling, workshops/seminars on learning techniques, techniques for exam preparation, etc.
  - International Office: general information on staying abroad

- Study advisors
  - Master Computer Science: Dr. Florian Frohn
    - master@cs.rwth-aachen.de
  - Minors:
    - https://www.informatik.rwth-aachen.de/cms/Informatik/Fachgruppe/Kontakt/~mosm/Fachstudienberater/
  - Exchange semesters: Dr. Dirk Thißen
    - student-exchange@cs.rwth-aachen.de

- Offerings by students
  - Allgemeiner Studierendenausschuss (AstA)
    - asta@asta.rwth-aachen.de
    - www.asta.rwth-aachen.de
  - Fachschaft I/1 (Mathematik/Physik/Informatik)
    - fs@fsmpi.rwth-aachen.de
    - http://www.fsmpi.rwth-aachen.de/

Libraries

- Computer Science Library
  - Computer Science Center

- Main library
  - Templergraben 61
  - Textbook collection (Lehrbuchsammlung)

New Examination Regulations

- Starting next semester

- You can (but don't have to) switch

- „Studium Generale" instead of minor

- New structure for electives

Thank You
for your Attention

Florian Frohn

RWTH Aachen University
52056 Aachen

www.rwth-aachen.de