

MATHEMATICAL MODELING, SIMULATION, AND OPTIMIZATION (M. SC.)

Frequently Asked Questions

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How to read this FAQ

This document is a list of frequently asked questions concerning the Master's program "Mathematical Modeling, Simulation, and Optimization" (MMSO) at the University of Koblenz. It is especially an excerpt of the examination formalities and is not legally binding. The legally binding document is the official Prüfungsordnung (examination formalities).

General Information

- This is our [webpage](#).
- This is the [module manual](#).
- These are the [examination formalities](#). These are in German language for legal reasons.
- Sent an E-Mail to mmso@uni-koblenz.de.

Admission Requirements

Who can apply for MMSO (M. Sc.)?

Applicants who hold a Bachelor degree in mathematics, physics or computer science that is recognized by the examination committee, are entitled to apply for the Master's degree program "Mathematical Modelling, Simulation, and Optimization". Moreover, applicants who have completed the Bachelor degree program "Mathematical Modeling" at the University of Koblenz can apply for the Master program.

Only candidates with a final grade of at least 2.5 (German grading system) in the Bachelor degree program will be accepted; the examination committee will decide on exceptions on application.

Candidates can enroll in the Master's degree program "Mathematical Modeling, Simulation, and Optimization" if the official transcript of the Bachelor's examination has not yet been issued. However, all examinations will have been taken before the start of the Master's degree program, and the examination is likely to be awarded a grade of 2.5 or better. If evidence of compliance with the admission requirements has not been provided by the end of the first semester, any such enrollment will be considered null and void. dieser Punkt muss angepasst werden

How do I apply for MMSO?

The application procedure depends on different criteria.

- If you already passed a German "Studienkolleg" you can directly apply at our "Bewerbungsportal".
- If you received a European Baccalaureate, you can directly apply at our "Bewerbungsportal"
- In case that you already received a VPD (uni-assist evaluation report) from uni-assist, you can directly apply at our "Bewerbungsportal".
- All other applicants apply via [uni-assist](#).

See [WelcomeCenter](#)→[How to apply](#) for more information.

Most international applicants are in the fourth group and have to apply via [uni-assist](#). It is an independent organization whose main task is the evaluation of international school/university certificates in regard to their equivalence to German school/university degrees. Please note that you need to pay a processing fee for the online application. Information on payment and bank account details can be found on the website of the [Welcome Center](#). You are also required to send a signed copy of your application and the certified documents by postmail to uni-assist.

Applications can only be considered by uni-assist after the timely submission of all documents in the required form and payment of the processing fee.

Decisive for timely submission is the "received-by" date indicated by uni-assist, not the postmarked date. Please note that applications that are not received by postmail before the deadline or are incomplete are not considered for approval.

It takes up to 8 weeks until you get the admission letter by email if you are accepted. If you are admitted to the study program, you will be provided with information regarding the further steps.

Where can I find more information about how to apply, accommodation, visa and entry requirements, etc.?

For more information please visit the website of the Welcome Center of the University of Koblenz: [Welcome Center](#)

Which prior knowledge is required to study MMSO?

Complex, cross-linked systems pervade our daily life e.g. in natural sciences, engineering, life sciences, or logistics. The key to tackle the challenges imposed by these systems is mathematical modeling in a broad sense which is based on an advanced knowledge of

- Mathematics
- Physics
- Computer Science

It is highly recommended to pass the provided [self-assessment test](#). This contains an absolute minimum of mathematical knowledge to successfully participate in our program.

Which level of English is required to apply for the Master program?

A requirement for admission to the Master's degree program is knowledge of English that is at least equivalent to Level B2 of the Common European Framework of Reference for Languages (equivalent to TOEFL of at least 72 points or IELTS of at least 5.0 points). Evidence can be provided either in the form of a school-leaving qualification, a degree in the corresponding languages or corresponding certificates. dieser Punkt muss angepasst werden

Job prospects

How can MMSO help me in my employability?

The need for qualified scientists in the MINT sector continues unabated in all areas of society. Having experienced this unique program in mathematical modeling, graduates will be generalists rather than specialists: Due to your application-oriented and cross-sectional studies you will get a wide spectrum of knowledge and skills. Thanks to your sound education in mathematical methods and your knowledge in modern software tools you will be the versatile and conjunctive backbone of interdisciplinary teams coping with future challenges.

Consequently you will find interesting fields of work in various industrial sectors and interesting positions in major companies addressing e.g. engineering, consulting or finance. Alternatively you can also pursue a PhD in mathematics, physics, or computer science.

If you are still wondering what to do with a mathematics degree later on, [this article](#) might be useful for you.

Studying in General

How much time should I plan in for the MMSO M.Sc.?

You will need at least 4 semesters (=2 years) to successfully complete the Master program of MMSO.

What are the semester and the lecture period?

The summer semester starts on 01. April and ends on 30. September. The winter semester starts on 01. October and ends on 31. March.

The lecture period is not completely fixed but in summer semester lectures typically start in the third week of April and end mid of July, while lecture period in winter semester starts in third week of October and ends mid of February, see [Dates and Deadlines](#).

What are CP, ECTS, SWS, LP?

One *credit point* (CP) is a measure of workload for your studies and corresponds to around 30 hours of studying. Credit points are awarded for successfully passing exams.

The German name is *Leistungspunkt* (LP), you might see this in some documents.

The *European Credit Transfer System* (ECTS) is a system to compare studies at different European universities. One ECTS point corresponds to one credit point.

One *Semesterwochenstunde* (SWS) means that a course has a teaching time of 45 minutes every week. Typical courses contain 4 SWS lectures (i.e. two lectures of 90 minutes every week) and 2 SWS tutorials (i.e. one class of 90 minutes every week).

How many CP do I have to reach and how are they gained?

For your Master degree you need to achieve 120 credit points of which

- 30 credits are awarded for your thesis,
- 51 credits are awarded for compulsory modules,
- 39 credits are awarded for elective modules.

Credit points are awarded for successfully passing exams of various form, like written exams, oral exams, or presentations. This depends on the courses that you apply. Depending on the electives that you choose, you might achieve in total more than 120 credits.

Which modules are compulsory?

The compulsory modules are

03MA2501	Applied Differential Equations	6 SWS	9 CP
03MA2502	Optimization I	6 SWS	9 CP
03MA2503	Numerics for Partial Differential Equations	6 SWS	9 CP
03MA2504	Optimization II	6 SWS	9 CP
03XX2501	Project Seminar	2 SWS	15 CP

Which modules are elective?

The elective courses must be selected from the “Advanced Mathematics” “Physics in Applications” and “Computer-based Methods” groups, assuming that the content has not already been covered by the Bachelor degree program on “Mathematical Modeling” (for details see examination regulations §7)

How many courses do I have to take every semester?

You can take as many courses per semester as you like. Approximately, you should get 30 credits per semester. It is not recommended to aim for significantly more credits.

Do you provide a schedule?

There is no fixed schedule, but we provide a recommended schedule for the compulsory courses (see below). In general, students have the possibility to set their own priorities in their studies by choosing between specific elective courses. A high amount of self-responsibility and the ability to study independently is expected for Master students at German universities. Choose your electives such that together with the compulsory modules around 30 CP are achieved every semester.

Semester		Students starting in winter semester			
1	Winter	Applied Differential Equations	9 CP		
2	Summer	Numerics of Partial Differential Equations	9 CP	Optimization I	9 CP
3	Winter	Project Seminar	15 CP	Optimization II	9 CP
4	Summer	Master thesis	30 CP		

Semester		Students starting in summer semester			
1	Summer			Optimization I	9 CP
2	Winter	Applied Differential Equations	9 CP	Optimization II	9 CP
3	Summer	Numerics of Partial Differential Equations	9 CP	Project Seminar	15 CP
4	Winter	Master thesis	30 CP		

Can I take course X before course Y?

You can take courses in any order you like. However, some modules have prerequisites for participation, namely “Numerics for Partial Differential Equations” requires knowledge from “Applied Differential Equations” and “Optimization II” requires “Optimization I”. In these cases you **must** first attend the lectures “Applied Differential Equations” and “Optimization I”.

Is it compulsory for MMSO students to at least take one course from each of the fields “Advanced Mathematics”, “Physics in Application”, and “Computer-based Methods”?

No, you can choose your electives freely from these fields and you do not need to cover all fields.

What are the courses in the field “Advanced Mathematics”?

In general, there are three “container modules” in this field, i.e.

1. Special Topics of Mathematics
2. Special Topics of Applied Mathematics
3. Specialization in Mathematics

during each semester we try to provide at least two courses from those topics. You are allowed to take **at most** one course from each container. The actual topic of the courses in any of these container modules vary over semesters; see the course plan in KLIPS.

What if I completed more elective modules than required?

Your credit points for electives will sum up (in the order you have successfully completed them i.e. “first come, first count”) until you reach the limit of 120 CP. If you have done more electives than you must have done, they will appear in your final transcript of records but won’t influence your final grade.

What happens if I have got more than 120 credits?

It is possible that you will get more than 120 credits due to the issues described above. Additional elective courses will appear on your final transcript of records but won’t influence your final grade.

I want to do an internship in a company. Is there any way I can get CP for it in my Master program?

You can do your project seminar with a company. Our master program does not give credits for internships. If you want to link your work in a company with your academic studies, we suggest writing your Master thesis about it. But keep in mind that a thesis requires a scientific research question and can not be about implementation only.

I am attending a summer school/ taking a course at another university. Can I transfer the credits to the MMSO program?

Yes, it is possible to transfer credit points. Nevertheless, you must contact the examination office beforehand and provide a detailed course description (number of credit points, contents). Only then can we estimate if and to which MMSO course the credit points can be transferred.

Course Achievements and Module Exams

Which are the requirements for awarding of credit points?

Credit points are awarded for successfully passing examinations.

Do I have to complete assignments to be able to register for the exams?

Not in general. Your lecturer will let you know at the beginning of term.

Assignments have to be completed to take part in the exams for the compulsory modules “Applied Differential Equations”, “Optimization 1”, and “Optimization 2”.

Moreover you regularly have to participate in all courses of a module if these courses are seminars, practical training or exercise classes. Full participation can still be certified if a student fails to attend up to two single courses. Exceptions are only permitted in justified individual cases.

Which methods will be used to assess my performance?

You will be deemed to have successfully participated in a course if your performance is considered at least sufficient. If a mark is awarded, any mark better or equal to 4.0 is considered successful passing.

Several methods may be used to assess performance, primarily written examinations, oral examinations, portfolios (laboratory notebook and, if applicable, other documents, e.g. articles, plots, papers), seminar talks, colloquia, reports, practical exercises and term papers. You will be informed of the nature and duration of the methods to be used to assess performance by the start of the course at the latest.

How does the German Grading System look like?

The University of Koblenz uses the 5 point grading system:

Very good (1.0, 1.3) You have successfully completed a major part of your exam, but there are some minor areas you must improve.

Good (1.7, 2.0, 2.3) You have shown decent academic performance by correctly completing a considerable proportion of your exam.

Satisfactory (2.7, 3.0, 3.3) Your performance was a bit more than sufficient and you need to work in several areas.

Sufficient (3.7, 4.0) You have reached the minimum score to pass the exam, but your performance leaves much to desire.

Fail (5.0) Your performance lies behind the minimum score.

Every result better or equal to 4.0 is considered a successful passing of the exam. Please be aware that the whole range of grades is used at the University of Koblenz. If you want to convert your grades from your home country please visit: [Grade-Conversion](#).

I registered for an examination, but I do not want to do it anymore. Do I have to complete it anyway?

You can withdraw from any examination within a given time after you registered. These withdrawal periods differ between courses and can be reviewed in KLIPS. If you miss the withdrawal period, you

must take that exam. Keep in mind that if you are registered for an exam and don't take the exam, it will count as "failed".

I am sick. Do I have to take the exam?

No, but you will need to inform the exam office beforehand if you are not able to take the exam and you have to provide a sick certificate from your doctor from the same day.

Can you give me a confirmation letter for a passed exam?

No. All examination results are entered in KLIPS only. The exam office can give you a transcript of records.

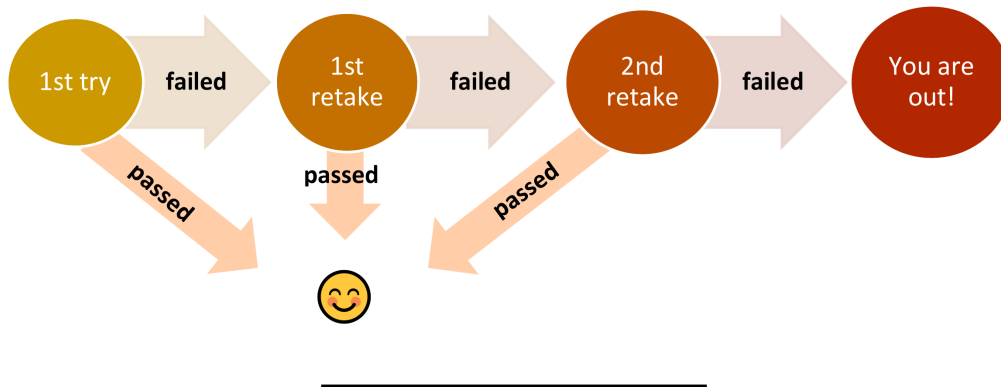
Can I retake an already passed exam to improve my grade?

No, this is not possible.

Retakes and Failed Exams

I failed an exam. How many retakes will I be able to take and how is the process going to be?

A module examination not evaluated at least as “sufficient” (4.0) can be retaken twice. If you are not awarded a grade of at least “sufficient” for the second retake, you will have definitively failed the module examination and will no longer be able to successfully complete the full Master’s degree program. You **DO NOT** have a third retake!



When will the retakes take place? Do you offer them every semester?

The first and, if applicable, the second retake must take place within 12 months of the date of the first failed module examination. You have to register for every retake separately in KLIPS. In general, the retake will take place at the beginning of the semester after your failed exam.

Good scientific practice

Where can I find hints and tips on academic writing and presentations?

Here you can find Matthias Thimm's guidelines for seminar presentations and technical reports. (from WeST website).

Do you offer workshops on academic writing?

Yes, we do, and we strongly recommend to take them. There is a course called "Scientific English" which can be found in KLIPS. You have to register for the course.

Plagiarism and cheating

What is plagiarism?

Plagiarism is "an act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author" ([dictionary.com](https://www.dictionary.com)).

Can I discuss home assignments with fellow students or will that be counted as plagiarism?

You are allowed to discuss home assignments with colleagues and this is highly recommended, but you are not allowed to jointly work on the assignments or copy solutions. If you hand in assignments in groups, please mention all names of the participants.

What are the consequences of plagiarism and cheating?

Dishonesty (cheating, plagiarism) is a major academic offense and will have major consequences. Cheating or plagiarizing will result in failing the exam, assignments or thesis. In severe cases, students can be banned from all further exams in that course (which can even result in a ban from the whole program).

In certain cases plagiarism is also a criminal offence and subject of legal prosecution; e.g. ignoring copyrights.

I plagiarized just one of my home assignments. Does this mean I cannot complete the entire course?

Correct.

Master Thesis

What do I have to do if I want to write a thesis in MMSO?

The main steps are

1. Find a supervisor and a topic for the thesis.
2. Register your thesis at the examination office. Sent an E-Mail to hochschulpramt@uni-koblenz.de and ask for the corresponding form. Sign this together with your supervisor and hand this in.
3. The examination office confirms your registration and sets the deadline for thesis submission.
4. Hand your thesis in on time.
5. Give a short presentation on your thesis within four weeks after submission.

Detailed Procedure and Guideline for your Master Thesis

Step 1: Decide to Write your Master Thesis and Contact Us

8 weeks before the official registration at the examination committee

You have decided to write your Master thesis. If you have already an idea about a topic of your thesis, look up which lecturers work in the field of your interest. If you haven't decided yet, you can contact a lecturer whose seminars, lectures or working field you are interested in. It is possible to write your Master thesis with a company. In that case please get in contact with the head of the examination committee to talk about your possibilities.

Step 2: Register at the Examination Committee

You and your examiners agree on a chosen topic and the official time phase of 24 weeks to work on your thesis begins. You may register for the Master thesis after completion of the third semester, but you must register within six weeks after delivering all the evidence of course achievements (= 90 credit points). Otherwise, the Master thesis shall be deemed to have been failed at the first attempt. To register your thesis, ask the examination office (hochschulpramt@uni-koblenz.de) for the relevant document. This is signed by you and your supervisors. In case that you write your thesis in a company it is also signed by the head of the examination committee.

Step 3: Working on Your Thesis

6 months before the official submission

Plan in enough time to critically and thoroughly elaborate your models' analysis, simulations'/experiments' evaluation and interpretation according to your topic. You should meet with your supervisor at least every two weeks so he/she can provide feedback on your work and progress. If you need an extension of time, you should talk to your supervisor. In justified exceptional cases (e.g. illness) you can get an extension by up to one month. A sick certificate should be submitted.

Step 4: Check your Thesis

2 weeks before the official submission

Check your paper on formal requirements, plagiarism (cite all used references and literature), correctness and fluency of language. You have to write academic and not colloquial! Use L^AT_EX for typesetting.

Step 5: Submit your Thesis on time

You will have to submit three bound versions of the thesis and one electronic version to the examination committee by the specified deadline. You must also submit a written statement that you are solely responsible for the thesis and used no sources and aids other than those stated. The deadline is fixed. If you do not hand in your thesis on time, your thesis is considered as “failed”.

Step 6: Oral Exam

Max. 4 weeks after the official submission

The final oral examination should be held within four weeks of the date of submission of the Master thesis. The chairperson of the examination committee shall set a date for the final oral examination and notify you of this date two weeks beforehand at the latest. Three credit points are awarded for the final oral examination. Prepare a short presentation of around 30–60 minutes of your main results.

Workload, Credit Points and Final Oral Examination

You will need approximately one semester (6 months) for your Master thesis. We recommend not to take any additional courses or working in other jobs due to the high workload. You should talk about the length of your Master thesis with your first examiner. As a rough guideline, a Master thesis is about 50–80 pages long. After registration of your thesis at the examination office you have 24 weeks to complete your thesis work.

Your Master thesis will be awarded $27 + 3$ credit points (27 CP for written Master thesis; 3 CP for oral exam) (810 hours + 90 hours).

The final oral examination should be held within four weeks of the date of submission of the Master thesis. The chairperson of the examination committee shall set a date for the final oral examination and notify you of this date two weeks beforehand at the latest. Three credit points are awarded for the final oral examination.

Supervisor(s) of your Master Thesis

You will be supervised by an examiner when preparing your thesis. The supervisor will provide you with guidance during your thesis preparation and regularly enquirer about the progress of the work.

The thesis is generally assessed by two persons in the form of written evaluations. One evaluation is prepared by the supervisor. The second examiner is appointed by the chairperson of the examination committee. One of the examiners must be a professor from Faculty 3: Mathematics or Sciences or Faculty 4: Computer Science.

It is also possible to be supervised by a member of a company. However, it is crucial to be in mutual exchange with the university. Please contact the head of the examination committee for further information.

I have my own idea for a master thesis. Can I write my master thesis about that?

If you have an idea, contact the profs to find a supervisor. If you find somebody who is willing to supervise you proposed topic, your are fine.

When will I be able to start with my Master's thesis?

Candidates can generally register for the Master's thesis after completion of the third semester but must register within six weeks after delivering all the evidence of course achievements (meaning when you have achieved the 90 credits). Otherwise, the Master's thesis shall be deemed to have been failed at the first attempt. Applicants will be entitled to submit a Master's thesis if they

1. Have acquired at least 60 CPs; and
2. Have agreed on a provisional topic for the Master's thesis with their supervisor.

Can I write my Master thesis together with another student as a joint work?

No this is not possible.

Can I write my thesis in English or German?

The Master's thesis must be written in English.

I heard that I will have to submit a German abstract of my thesis. Is that true?

No, you don't have to write a German abstract. Everything has to be written in English.

Can I submit my thesis before the deadline?

Of course. But you should check with your advisor first to ensure your thesis is of high quality, despite the reduced time.

Is it possible to extend the deadline for thesis submission?

At a candidate's request, the examination committee can extend once with the consent of the supervisor in justified exceptional cases. If you wish to get an extension of the deadline, send an e-mail to the **examination office** containing your reasons for the extension.

My master thesis was graded insufficient and I failed. Can I try again?

A failed thesis can be repeated once. The examination committee shall ensure that the candidate receives a new topic for a thesis within six weeks from notification of the grade. It is not permitted to repeat the thesis a second time. If the second attempt is not registered at the examination office within six weeks it is considered "failed" and your Master studies failed.

I want to submit my master thesis as a paper to a conference; what should I do?

Your supervisor can guide you in your chances of publishing your material at a conference and give you advice for improvements.

I have just submitted my thesis (the only remaining examination), but my future employer needs confirmation that I passed the Master program now. What can I do?

Ask both of your supervisors to send a brief note to the examination office (hochschulpramt@uni-koblenz.de) confirming that you passed the thesis with at least grade 4.0, but the final grading is still in progress. Then ask the examination office for a preliminary confirmation that you successfully passed the Master program.

Guidance and Counselling

Academic issues

Questions related to the curriculum, examination, course requirements, professional knowledge: Dr. Robert Rockenfeller, Dr. Christian Kahle and Prof. Thomas Götz.

Non-academic issues

Questions related to the visa, health insurance, accommodation, orientation days, buddy-program, social and cultural events, German labour market: Welcome Center.

Waiting for the admission letter?

Always include your uni-assist application number and full name in your e-mail. Usually, successful applicants will be notified by the University's Registrar's Office two weeks after uni-assist has sent the documents to the university, not before. Due to the high working load during admission periods (Dec–Feb, Jun–Aug), rejected applicants will be notified later.