

Master's Materials Science at Stuttgart University Curriculum

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Contents

1 Curriculum Overview	1
2 Curriculum Areas	1
2.1 Compulsory Modules (51 CP)	2
2.2 Specialization Subject Modules (30 CP)	2
2.3 Compulsory Elective Modules (9 CP)	3
2.4 Master's Thesis Materials Science (30 CP) + Preparation	3
3 Master's Thesis Details	3

1 Curriculum Overview

The curriculum for the Master's program in Materials Science is presented in the [Masterplan](#). The columns on the left side indicate the number of the semester (Sem.) and the number of credit points (= CP; in German: Leistungspunkte = LP) for each semester. Semesters I and III correspond to the winter semester, while Semesters II and IV correspond to the summer semester.

The Master's program in Materials Science can be started in either the winter or summer semester. If your study begins in the summer semester, the order of semesters is II, I, III, IV. The curriculum plan offers further flexibility. For example, modules listed in Semester I can also be taken in Semester III.

Each module consists of one or more classes (e.g., lectures, tutorials, labs, and/or seminars). Each module is characterized by a thematic focus and a specific number of credit points (1 CP corresponds to approximately 30 hours of work). It concludes with an examination. If a module is to be completed within a semester, the corresponding exam must be registered via [C@MPUS](#). Registration must take place during the official registration period of the respective semester!

Current [timetables](#) are published before the start of each semester. Check them in time! The timetables include hyperlinks to class announcements and seminar topics (only from our Institute for Materials Science).

- The [Masterplan](#) includes links to each module for direct access to the description.
- In the [timetables](#), look out for further links to current information.
- Here are the important [examination registration periods](#).
- More details follow below. If you have any questions, don't hesitate to contact us.
- Academic Advisor: [Dr. Schacherl](#), Dean of Studies: [Prof. Grabowski](#).

2 Curriculum Areas

The modules in the curriculum are divided into the following four areas.

German	English	Section
1. Vertiefungsmodul (51 LP)	Compulsory Modules (51 CP)	2.1
2. Spezialisierungsfach-Module (30 LP)	Specialization Subject Modules (30 CP)	2.2
3. Pflichtwahlmodule (9 LP)	Compulsory Elective Modules (9 CP)	2.3
4. Masterarbeit Materialwissenschaft (30 LP)	Master's Thesis Materials Science (30 CP)	2.4

Note: The German and English links are the same. Whether the German or English C@MPUS version is displayed depends on whether you are logged into C@MPUS and which language you have selected. The same applies to the links referencing the CAMPUS module tree below.

2.1 Compulsory Modules (51 CP)



Dark blue in the [Masterplan](#)

The area [Compulsory Modules \(51 CP\)](#) includes the following modules:

- [Synthesis and Properties of Inorganic Materials \(6 LP\)](#) (lecture with exercises)
- [Advanced Materials Science Laboratory \(9 LP\)](#) (lab course)
- [Atomic Transport and Phase Transformations \(6 LP\)](#) (lecture with exercises)
- [Polymer Materials Science \(9 LP\)](#) (lecture and seminar)
- [Advanced Science Seminar \(6 LP\)](#) (seminar)
- [Practical Skills and Project Planning \(15 LP\)](#) (Master's thesis preparation)

All compulsory modules are a fixed part of the curriculum and must be completed. They total 51 CP.

Lecture and exercise schedules can be found in the upper C@MPUS links under *"Courses and Exams"* (*"Lehrveranstaltungen und Prüfungsveranstaltungen"*). Click the plus under *"Offer node"* (*"Angebotsknoten"*) and follow the link that appears.

Additional Information

The module "Advanced Materials Science Laboratory" includes a lab course and is offered each winter semester. Registration is required! Details can be found in the current [timetables](#) (click on the *Information* link in the **lab course box**; note: winter semester only). The registration period typically starts in early October.

The module "Advanced Science Seminar" involves participating in a seminar (presentation of a scientific topic and discussion of other students' presentations) and attending at least 8 certified talks in the materials science colloquium. Use this [form to certify attendance](#). Seminars usually take place in the winter semester. Topics are listed in the current [timetables](#) (click on the *Topics* link in the **seminar box**; note: winter semester only). Topics are proposed by the materials science faculty. To participate, you must register for a topic directly with the offering lecturer (contact info is in the announcements). Seminar topics are provided 2–4 weeks before the start of lectures.

The module "Practical Skills and Project Planning" prepares you for your thesis research. Formally, it belongs to the **Compulsory Materials Science Modules**, and its 15 CP are included in the 51 CP total. Content-wise, however, it fits better with the Master's thesis. Therefore, it is shown with a gradient from light to dark blue in the module diagram. More details are listed below, together with the Master's thesis.

2.2 Specialization Subject Modules (30 CP)



Gray in the [Masterplan](#)

The area [Specialization Subject Modules \(30 CP\)](#) is a module container worth 30 CP. You may select 2 or 3 specialization fields from the list below. Each field includes a list of elective modules. You fill the container with modules from the selected fields. Most of these modules are taught in English, but some are only available in German. Here is the list of specialization fields:

1. [Polymer Science and Plastics Engineering](#)
All modules are taught in German except "Structure and Properties of Functional Polymers" and "Biopolymers for Pharmaceuticals".
2. [Advanced Materials Characterisation](#)
The module "Physikalische Chemie III" is taught in German.
3. [Functional Materials](#)
4. [Inorganic Materials Chemistry](#)
Some modules are taught in German (check with instructors beforehand).
5. [Materials Theory and Simulation](#)
These modules are taught in German: "Computergestützte Materialwissenschaft" and "Methoden der Werkstoffsimulation".

6. Metals and Structural Materials

These modules are taught in German: “Werkstoffeigenschaften”, “Schadenskunde”, “Fügetechnik”, “Grundlagen der Keramik und Verbundwerkstoffe” and “Werkstoffe und Fertigungstechnik technischer Kohlenstoffe”.

7. Nanomaterials and Nanostructures

8. Soft Matter and Biomaterials

Procedure for selecting the specialization subjects:

1. Choose 2 or 3 specialization subjects from the list above.
Example: “Functional Materials”, “Materials Theory and Simulation”, and “Metals and Structural Materials”.
2. Select modules totaling 30 CP from the selected subject lists. For each subject, you may choose between 6 and 24 CP worth of modules.

Example:

Specialization Subject	Module	CP
Functional Materials	Semiconductor Physics	9
	Polymer Electronics	3
Materials Theory and Simulation	Materials Design by Ab initio Methods	6
	Computational Chemistry	6
Metals and Structural Materials	High resolution and analytical microscopy	6

In the subjects “Polymer Science and Plastics Engineering”, “Inorganic Materials Chemistry”, and “Metals and Structural Materials”, there is a distinction between **Compulsory Modules** and **Optional Modules**. At least one module must be selected from the compulsory section; the rest can be freely chosen from both.

In exceptional cases, an individual selection may be approved by the examination board if a coherent profile is recognizable. Some modules are only offered every two years. Early planning is strongly recommended.

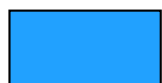
2.3 Compulsory Elective Modules (9 CP)



Dark gray in the [Masterplan](#)

The area [Compulsory Modules \(51 CP\)](#) allows you to look beyond the materials science horizon. The modules are divided into **Engineering Science Modules** and **General Skills Modules**. Additional modules may be added upon request and approval by the examination board (contact [Dr. Schacherl](#)).

2.4 Master’s Thesis Materials Science (30 CP) + Preparation



Light blue in the [Masterplan](#)

Formally (i.e., regarding the CP count), the module “Practical Skills and Project Planning” belongs to the compulsory modules. However, content-wise, it aligns more closely with the thesis and is thus explained here.

The module [Practical Skills and Project Planning \(15 LP\)](#) serves as preparation for the Master’s thesis. During this preparation, literature research is performed to establish the current state of knowledge and to plan the thesis structure (e.g., experimental or simulation plan). The module concludes with a presentation or a poster session. Your supervisor and examiner will be the same person (main reviewer). Note that the 15 CP of this module are already included in the compulsory module section.

The [Master’s Thesis Materials Science \(30 CP\)](#) includes the execution of experiments or simulations and the documentation of methods, results, and conclusions. The maximum duration is 12 months, with 30 CP corresponding to 6 months of full-time work.

3 Master’s Thesis Details

The Master’s thesis is the final component of the Materials Science Master’s program and offers deep practical experience in “real” scientific work. The project is conducted under the guidance of an experienced researcher but should primarily rely on your own initiative. The thesis should demonstrate your ability to independently address a materials science problem using scientific methods and to present the results appropriately within a set time frame.

It is advisable to take an early look at the [evaluation form](#). It contains the most important criteria by which your Master's thesis will be evaluated.

The thesis is typically conducted at the Institute for Materials Science or the Institute of Polymer Chemistry. The topic can be issued once at least 51 CP have been obtained. This must be proven at the time of the topic assignment. The topic is assigned by the main reviewer, usually a habilitated member of the teaching staff from the institutes mentioned above. Possible topics are listed on the institutes' websites. You may also contact the staff directly.

The thesis is assessed by two reviewers (main and secondary). According to the examination regulations, eligible reviewers include:

- [Prof. Bill](#)
- [Prof. Buchmeiser](#)
- [Prof. Clemens](#)
- [Prof. Grabowski](#)
- [Prof. Ludwigs](#)
- [Prof. Schmitz](#)

Additional reviewers may be lecturers with examination authorization responsible for a specialization module.

Thesis Registration

To register, use the form available via C@MPUS. It will appear under "My Applications" once the required credit points are reached. Please ensure your supervisor and the head of the examination committee sign the form. Additionally, a separate [internal form \(download here\)](#) from the Institute for Materials Science must be completed and signed by both reviewers and the examination board chair. The internal form contains detailed instructions.

"External" Execution of the Master's Thesis

The Master's thesis may be conducted at other institutes or in industry if the following conditions are met:

- The topic must be assigned by one of the professors listed above.
- Part of the work must be carried out at the Institute for Materials Science or the Institute of Polymer Chemistry.
- If you seek an "external" thesis, be aware that only topics within your intended main reviewer's research scope are usually accepted.
- Students planning an external thesis must contact a main reviewer early and coordinate the project with them.