

**Study Regulations for the English-language consecutive degree program  
Advanced Manufacturing  
leading to the degree of Master of Science (M.Sc.)  
at Chemnitz University of Technology  
from 18. Juni 2026**

Pursuant to Section 14(4) in conjunction with Section 37(1) of the Act on Higher Education Institutions in the Free State of Saxony (Saxon Higher Education Act – SächsHSG) of 31 May 2023 (Saxon Law and Ordinance Gazette, p. 329), as last amended by Article 2 of the Act of 31 January 2024 (Saxon Law and Ordinance Gazette, pp. 83, 87), the Faculty Council of the Faculty of Mechanical Engineering at Chemnitz University of Technology has issued the following study regulations:

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For the sake of readability, the generic masculine form is generally used below. Naturally, all references to persons apply to all genders.

**Part 1  
General provisions**

**§ 1  
Scope**

Based on the applicable examination regulations (§ 9), these study regulations govern the objectives, content, structure, schedule, and conduct of the "Advanced Manufacturing" degree program—leading to a Master of Science degree—at the Faculty of Mechanical Engineering of Chemnitz University of Technology.

**§ 2  
Start of studies and standard period of studies**

- (1) Studies generally commence in the winter semester.
- (2) The standard period of study for the degree program is four semesters (two years), or eight semesters (four years) for part-time study. The program comprises modules totaling 120 credit points (CP). This corresponds to an average workload of 3,600 hours.

### **§ 3**

#### **Admission requirements**

(1) Admission to the Master's degree program in Advanced Manufacturing is granted to applicants who have obtained a first professional university degree in an engineering or natural science program and who additionally demonstrate in-depth academic knowledge in the following areas:

1. specialized mathematical methods in engineering (totaling at least 18 ECTS credits), including the topics of Fourier transforms, regression analysis, and probability and mathematical statistics;
  2. scientific and engineering data processing (totaling at least 12 ECTS credits), including the topics of CAD, CAS, numerical simulation, data acquisition, and Multiphysics simulation (including practical experience);
  3. metrology and control technology (totaling at least 8 ECTS credits), including the topics of sensor technology, actuator technology, and digital manufacturing methods;
  4. new materials and engineering materials (totaling at least 8 ECTS credits), including the topics of polymers, metals, composite materials, matrix systems, and functional properties;
  5. in-depth theoretical fundamentals of engineering (totaling at least 12 ECTS credits), including the topics of engineering mechanics, design, manufacturing technology, and fluid dynamics;
  6. resource-efficient manufacturing concepts (totaling at least 8 ECTS credits), including the topics of technical and natural cycles and networks, system optimization, and energy concepts;
- and who provide proof of English language proficiency at level B2 according to the Common European Framework of Reference for Languages (CEFR).

(2) The Examination Board decides on the admission of other applicants.

### **§ 4**

#### **Forms of teaching and learning**

(1) Teaching and learning formats may include: lectures (V), seminars (S), exercises (Ü), projects (PR), colloquia (K), tutorials (T), practical courses (P), simulation games (PS), or excursions (E). Students are expected to prepare for the courses they attend and to deepen their understanding of the content through independent study. The knowledge and skills required for the successful completion of the degree program are not acquired solely through attending courses; additional independent study is also required.

(2) E-learning methods may be employed in all teaching and learning formats listed in Paragraph 1, provided the character of the respective format is maintained.

(3) Courses are conducted in English. The module descriptions specify which courses are conducted in German.

### **§ 5**

#### **Objectives of the study program**

(1) Graduates are familiar with the specific characteristics of key material types and material systems and are able to make appropriate selections for specific tasks. Regarding processing and manufacturing, they are aware of the capabilities and limitations of current and future-oriented manufacturing processes and their associated production systems. Their knowledge of a wide range of processes, combined with practical experience in specific techniques, enables graduates to determine the most suitable processes for solving a given task. They are proficient in using digital methods and simulation tools for the safe and efficient design and configuration of products and systems. This encompasses methods such as the Finite Element Method (FEM) for mechanical design, computer-aided life-cycle assessment, and the modelling of material flows and intralogistics systems. The use of Augmented Reality (AR) and Virtual Reality (VR) technologies is also taken into account when designing human-technology interfaces. Human presence on-site will remain essential, even in increasingly complex future production processes. Graduates are able to assess the requirements for technical systems that interact with humans and to design and configure the corresponding interfaces.

(2) Depending on their chosen specialization, graduates of the degree program possess in-depth knowledge in the following subject areas:

1. Lightweight Technologies,
2. Smart Manufacturing,
3. Industrial Engineering,
4. Printed Functionalities,
5. Materials Engineering,
6. Mechatronics and Automation or
7. Computational Manufacturing Engineering.

Upon completion of the English-language consecutive Master's degree program in Advanced Manufacturing, graduates possess the ability to independently plan tasks, monitor their work progress, and complete assignments on schedule, as well as act with personal responsibility within project work. They are capable of identifying and acquiring new knowledge required to solve a task (e.g., through literature and patent searches, training, trade fairs). Furthermore, they have the ability to present their work results both in writing

and orally, thereby documenting their work in a manner that is comprehensible to others. They are able to assimilate the results of others and to communicate, reflect upon, and evaluate their own findings. In addition, they have deepened personal competencies such as self-management and project management.

(1) Graduates of the Advanced Manufacturing program identify as mechanical engineers with a strong focus on modern, future-oriented production processes. They possess the ability to successfully meet the specific challenges arising from the application and combination of production systems for processing high-performance materials. They are capable of analysing assigned tasks, translating them into a plan of action, and independently executing the defined work within heterogeneous teams organized around a division of labour.

(2) Furthermore, they have acquired an understanding of the overarching interrelationships within complex systems and can ensure that technical, economic, ecological, legal, and societal constraints are balanced in their activities. They are able to assess the non-technical impacts of their engineering work and act in an ethical and responsible manner. In doing so, they strive to implement the principles of good scientific practice—in accordance with the guidelines of the German Research Foundation (DFG)—when planning and conducting study, research, and development activities, as well as when publishing the corresponding results. Graduates are familiar with the concept of Open Science and know the essential tools for making their own scientific findings publicly accessible. Successful completion of the Advanced Manufacturing Master's program qualifies graduates to pursue further scientific work through a doctoral degree.

## **Teil 2**

### **Structure and content of the degree program**

#### **§ 6**

##### **Structure of the degree program**

(1) During the course of study, 120 ECTS credits are earned, composed as follows:

##### **1. Basic modules of Advanced Manufacturing (Σ 25 LP)**

|            |                                                        |                   |
|------------|--------------------------------------------------------|-------------------|
| 220000-614 | Mathematics for Engineering Science                    | 5 LP (Compulsory) |
| 231533-029 | Digital Tools for Smart Manufacturing                  | 5 LP (Compulsory) |
| 231231-014 | Humans and Mechatronics in Manufacturing               | 5 LP (Compulsory) |
| 231834-009 | Applied Materials and Composite Structures             | 5 LP (Compulsory) |
| 231432-008 | Modelling and Idealization in Manufacturing Simulation | 5 LP (Compulsory) |

##### **2. Specialization Modules for profile lines(Σ 30 LP)**

One of the profile lines listed below must be selected, along with the associated compulsory modules, comprising a total of 30 ECTS credits.:

##### **2.1 Lightweight Technologies**

|            |                                                   |                   |
|------------|---------------------------------------------------|-------------------|
| 231032-019 | Composite-based Technologies                      | 5 LP (Compulsory) |
| 231036-004 | Technical Textile Processes                       | 5 LP (Compulsory) |
| 231133-013 | Recycling of Plastics                             | 5 LP (Compulsory) |
| 231032-018 | Anisotropic Composites                            | 5 LP (Compulsory) |
| 231032-020 | Lightweight Technologies for Bio-based Structures | 5 LP (Compulsory) |
| 231032-025 | Carbon Fibre Lightweight Technologies             | 5 LP (Compulsory) |

##### **2.2 Smart Manufacturing**

|            |                                                    |                   |
|------------|----------------------------------------------------|-------------------|
| 231732-011 | Joining Technologies and Strategies                | 5 LP (Compulsory) |
| 231537-003 | Forming Process Chains                             | 5 LP (Compulsory) |
| 231539-006 | Geometrical Product Specification and Verification | 5 LP (Compulsory) |
| 231533-021 | Cyber-Physical Production and Robot Systems        | 5 LP (Compulsory) |
| 231533-020 | Machining Technologies                             | 5 LP (Compulsory) |
| 231534-007 | Efficient Process Chains                           | 5 LP (Compulsory) |

##### **2.3 Industrial Engineering**

|            |                                                |                   |
|------------|------------------------------------------------|-------------------|
| 231231-009 | Digital Ergonomics                             | 5 LP (Compulsory) |
| 231232-014 | Simulation of Production and Logistics Systems | 5 LP (Compulsory) |
| 231232-015 | Sustainable Smart Production                   | 5 LP (Compulsory) |
| 231231-011 | Applied Human Factors                          | 5 LP (Compulsory) |
| 231035-018 | Resilience in Manufacturing                    | 5 LP (Compulsory) |
| 231232-008 | Production Planning and Control                | 5 LP (Compulsory) |

## **2.4 Printed Functionalities**

|            |                                                        |                   |
|------------|--------------------------------------------------------|-------------------|
| 231732-008 | Printed Materials                                      | 5 LP (Compulsory) |
| 231732-015 | Additive Manufacturing                                 | 5 LP (Compulsory) |
| 231833-007 | Surface and Interface Engineering                      | 5 LP (Compulsory) |
| 231539-007 | Quality Assurance in Additive Manufacturing            | 5 LP (Compulsory) |
| 231732-007 | Structural Design of Additive Manufacturing Components | 5 LP (Compulsory) |
| 231732-014 | Joining of Additive Manufacturing Parts                | 5 LP (Compulsory) |

## **2.5 Materials Engineering**

|            |                                   |                   |
|------------|-----------------------------------|-------------------|
| 231834-008 | Materials Analysis                | 5 LP (Compulsory) |
| 231833-007 | Surface and Interface Engineering | 5 LP (Compulsory) |
| 231133-015 | Polymer Materials                 | 5 LP (Compulsory) |
| 231133-016 | Polymer Processing                | 5 LP (Compulsory) |
| 231832-009 | Materials Testing                 | 5 LP (Compulsory) |
| 231831-014 | Lightweight Metals and Ceramics   | 5 LP (Compulsory) |

## **2.6 Mechatronics and Automation**

|            |                                                          |                   |
|------------|----------------------------------------------------------|-------------------|
| 231131-004 | Sichere Mechatronische Systeme/Safe Mechatronic Systems  | 5 LP (Compulsory) |
| 231534-021 | Data Acquisition and Analysis of Manufacturing Processes | 5 LP (Compulsory) |
| 231536-007 | Components and Integration of Mechatronic Systems        | 5 LP (Compulsory) |
| 231534-020 | Design and Realisation of Mechatronic Systems I          | 5 LP (Compulsory) |
| 231536-008 | Design and Realisation of Mechatronic Systems II         | 5 LP (Compulsory) |
| 231536-009 | Advanced Mechatronic Systems                             | 5 LP (Compulsory) |

## **2.7 Computational Manufacturing Engineering**

|            |                                                                             |                   |
|------------|-----------------------------------------------------------------------------|-------------------|
| 220000-706 | Topics in Numerical Methods                                                 | 5 LP (Compulsory) |
| 231537-008 | Simulation in der Fertigungstechnik/Simulation in Manufacturing Engineering | 5 LP (Compulsory) |
| 231431-012 | Applied Modelling and Simulation in Solid Mechanics I                       | 5 LP (Compulsory) |
| 231431-013 | Applied Modelling and Simulation in Solid Mechanics II                      | 5 LP (Compulsory) |
| 231435-015 | Computational Methods of Heat Transfer                                      | 5 LP (Compulsory) |
| 231432-007 | Computational Modelling of Thermo-Mechanically Coupled Processes            | 5 LP (Compulsory) |

## **3. Vertiefungsmodule Electives/Soft skills (Σ 25 LP)**

Module 136004-017 is mandatory. Students whose native language is German select one module from the range 136001-004 to 136009-002 as an alternative.

|            |                                                    |                   |
|------------|----------------------------------------------------|-------------------|
| 136004-017 | Deutsch für Ingenieure (Maschinenbau) (Niveau B1+) | 5 LP (Compulsory) |
|------------|----------------------------------------------------|-------------------|

Modules totaling 20 ECTS, which are not in the chosen profile line of the student, must be selected from the modules 136004-007 through 261033-310. A maximum of 10 ECTS credits may be obtained from the language modules 136004-007 through 136009-002. Language modules corresponding to the student's native language may not be selected.

Students whose native language is not German and who cannot demonstrate German language proficiency at level B1 of the Common European Framework of Reference for Languages (CEFR) are required to take module 136004-007.

|            |                                                            |                 |
|------------|------------------------------------------------------------|-----------------|
| 136004-007 | Deutsch als Fremdsprache III (Niveau B1)                   | 5 LP (Elective) |
| 136001-004 | Englisch in Studien- und Fachkommunikation III (Niveau C1) | 5 LP (Elective) |
| 136001-006 | Englisch in Studien- und Fachkommunikation V (Niveau C1)   | 5 LP (Elective) |
| 136001-007 | Englisch in Studien- und Fachkommunikation VI (Niveau C1)  | 5 LP (Elective) |
| 136005-001 | Französisch I (Niveau A1)                                  | 5 LP (Elective) |
| 136005-002 | Französisch II (Niveau A2)                                 | 5 LP (Elective) |
| 136009-001 | Spanisch I (Niveau A1)                                     | 5 LP (Elective) |
| 136009-002 | Spanisch II (Niveau A2)                                    | 5 LP (Elective) |
| 231833-010 | Electroplating and Thermal Coating                         | 5 LP (Elective) |
| 231831-012 | Complex Materials for Manufacturing                        | 5 LP (Elective) |
| 231035-005 | Instrumentation                                            | 5 LP (Elective) |

|            |                                                     |                 |
|------------|-----------------------------------------------------|-----------------|
| 231733-011 | Industrial Robotics and Periphery                   | 5 LP (Elective) |
| 232033-012 | Fundamentals of Hydrogen Technologies               | 5 LP (Elective) |
| 232033-013 | Fuel Cells and Fuel Cell Systems                    | 5 LP (Elective) |
| 231435-016 | Techno-Economic Analysis of Hydrogen Energy Systems | 5 LP (Elective) |
| 261033-312 | Life Cycle-oriented Management                      | 5 LP (Elective) |
| 261042-301 | Sustainability Management                           | 5 LP (Elective) |
| 261033-310 | Resource Efficiency from an Economic Perspective    | 5 LP (Elective) |

#### **4. Module Applied Engineering Project**

|            |                             |                    |
|------------|-----------------------------|--------------------|
| 230100-860 | Applied Engineering Project | 10 LP (Compulsory) |
|------------|-----------------------------|--------------------|

#### **5. Module Master Thesis**

|            |               |                    |
|------------|---------------|--------------------|
| 230100-960 | Master Thesis | 30 LP (Compulsory) |
|------------|---------------|--------------------|

(2) The recommended course of study for the Master's program in Advanced Manufacturing at Chemnitz University of Technology within the standard period of study is determined by the schedule outlined in the study plan (see Appendix 1) and the modular structure of the program.

### **§ 7**

#### **Content of the degree program**

(1) The "Advanced Manufacturing" core modules provide the essential mathematical foundations required for the remainder of the degree program at its outset. In addition, students gain an initial overview of various forward-looking fields within mechanical engineering and current issues before specializing in one of seven study tracks. Depending on their interests, students may also select additional modules from the various study tracks as part of the "Electives/Soft Skills" specialization modules. An integral part of the program is the enhancement of foreign language skills—or, for international students, German language proficiency—with the aim of preparing for the German labour market. Building on the specialist knowledge and methodological skills already acquired, students work on an independent, practical project during the second year. Throughout this process, they receive methodological guidance on conducting independent academic work. The program concludes with the Master's thesis.

(2) The content, objectives, teaching methods, credits, examinations, frequency of offering, and duration of the individual modules are specified in the module descriptions (see Appendix 2).

### **Part 3**

#### **Conducting the studies**

### **§ 8**

#### **Academic advising**

(1) In addition to the central student advisory service at Chemnitz University of Technology, subject-specific academic advising is provided. The Faculty Council of the Faculty of Mechanical Engineering appoints a faculty member to carry out this advisory role.

(2) It is recommended to seek academic advice, particularly in the following cases:

1. before commencing studies, especially before beginning part-time studies,
2. before a period of study abroad,
3. before an internship,
4. in the event of a change of degree program or university,
5. after failing examinations.

### **§ 9**

#### **Examinations**

The regulations concerning examinations are set out in the examination regulations for the English-language consecutive Master of Science (M.Sc.) degree program in Advanced Manufacturing at Chemnitz University of Technology.

### **§ 10**

#### **Distance- and part time study**

Distance learning is not an option. However, the degree program may be pursued on a part-time basis in cases of employment, significant family obligations, or specific health-related limitations. The Examination Board decides on admission to part-time study if other valid reasons exist. For part-time study, the average workload per semester amounts to 50% of that of the full-time program.

**Teil 4  
Final Provisions**

**§ 11**

**Entry into force and publication, transitional provision**

These study regulations apply to students enrolling from the 2026/2027 winter semester onwards.

For students who commenced their studies prior to the 2026/2027 winter semester, the study regulations for the English-language consecutive Master of Science (M.Sc.) degree program in Advanced Manufacturing at Chemnitz University of Technology, dated 2 September 2024 (Official Announcements No. 43/2024, p. 2106), remain in effect.

These study regulations enter into force on the day following their publication in the Official Announcements of Chemnitz University of Technology.

Issued pursuant to the resolution of the Faculty Council of the Faculty of Mechanical Engineering dated ... and the approval granted by the Rectorate of Chemnitz University of Technology from ....

Chemnitz, the 18. Juni 2026

the Rector  
of Technical University Chemnitz

Prof. Dr. Gerd Strohmeier