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For the purpose of understanding only

**Study Regulations for the English-speaking consecutive degree program Advanced Manufacturing leading to the award of the degree Master of Science (M.Sc.) at Chemnitz University of Technology dated June 13, 2018**

In accordance with § 13 sec. 4 in conjunction with § 36 sec. 1 of the law governing the freedom of universities in the Free State of Saxony (Saxon Freedom of Universities Act - SächsHSFG) in the version published on January 15, 2013 (Sächs GVBl. - Saxon Law Gazette, page 3), last amended by article 1 of the Act of October 15, 2017 (SächsGVBl. p. 546), the Faculty Board of the Faculty of Mechanical Engineering of Chemnitz University of Technology has issued the following study regulations:

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**Part 4: Final provisions**



In the following, the generic masculine will generally be used for reasons of better legibility. All personal designations apply naturally to all genders.

## Part 1
## General terms

### § 1
### Scope

These Study Regulations govern the objectives, content, structure, sequence and conduct of the degree program Advanced Manufacturing leading to the degree of Master of Science at the Faculty of Mechanical Engineering at Chemnitz University of Technology based on the respective Examination Regulations (§ 9) in effect.

### § 2
### Start of degree program and standard period of study

(1) The degree program starts in winter term.

(2) The standard period of study for the degree program is four semesters (two years). The degree program comprises modules worth a total of 120 credits (Cr). This equates to an average workload of 3,600 hours of study.

### § 3
### Admission requirements

(1) Students meet the requirements for admission to the Master degree program Advanced Manufacturing who have obtained a first professional degree following a program in engineering or natural sciences and who prove enhanced scientific abilities on the following areas:

1. specific mathematical methods in engineering in the scope of at last 18 CP in total in which the areas Fourier transformations, regression calculation as well as probability and mathematical statistics are included,
2. scientific data processing in engineering in the scope of at least 12 CP in total in which the areas CAD, CAS, numeric simulation and data collection as well as multi-physical simulation including practical experiences are included,
3. Metrology and control engineering in the scope of at least 8 CP in total in which the areas sensors, actuators as well as digital methods of manufacturing are included,
4. New materials for engineering in the scope of at least 8 CP in total in which the areas polymers, metals, compound materials, matrix systems and functional characteristics are included,
5. enhanced theoretical basics in engineering in the scope of at least 12 CP in total in which the areas technical mechanics, construction, manufacturing theory as well as fluid dynamics are included,
6. resource-efficient manufacturing concepts in the scope of at least 8 CP in total in which the areas technical and natural circuits and networks, system optimization as well as energy concepts are included,

as well as proof of English language proficiency at level B2 according to European Reference Framework for Languages.

(2) The decision on the admission of other candidates belongs to the Examination Committee.

## § 4
## Teaching methods

(1) Teaching methods may include: lectures (V), seminars (S), exercises (Ü), projects (PR), colloquia (K), tutorials (T), internship (P), case studies (FS), simulation games (PS) or excursions (E).

(2) Classes are conducted in English. The module descriptions state the classes to be conducted in German.

## § 5
## Objectives of the degree program

(1) The objective of the degree program is the qualification for a Master of Science in Advanced Manufacturing at Chemnitz University of Technology. The degree program is mainly research-oriented dealing with new promising approaches in technology in connection with resource-efficient products and processes. In this respect, the students are taught the newest methods and scientific approaches as well as cutting-edge tools of the relevant scientific disciplines. The students acquire an enhanced professional education providing the abilities for the solution of highly-demanding tasks in research and development. By its four profile areas, the degree program is oriented towards the research key areas of Chemnitz University of Technology in a trans-disciplinary, faculty-overarching and future-oriented way. The research orientation as well as the methodology competencies provide the breeding ground for "lifelong learning" and thus the adaption of the own skills and abilities to the global demands of the future. In addition to the ability for scientific work, the students also acquire intercultural competencies due to the international and heterogeneous character of the degree program.

(2) The following profile areas are offered to the students for the acquisition of research-oriented enhanced knowledge:

1. Hybrid Technologies
2. Printed Functionalities
3. Work Design and Sustainability Management
4. Production Systems

(3) In addition, the supplementary modules Elective Courses provide the opportunity to acquire further special knowledge according to the respective interests in a target-oriented and profile-overarching way.

# Part 2
# Structure and content of the degree program

## § 6
## Structure of the degree program

(1) The program comprises 120 CP, which are broken down as follows:

**1. Core modules Advanced Manufacturing (∑ 20 CP)**

| | | |
|---|---|---|
| 1.1 | Mathematics for Engineering Science | 5 CP (compulsory module) |
| 1.2 | Digital Manufacturing | 5 CP (compulsory module) |
| 1.3 | Additive Manufacturing | 5 CP (compulsory module) |
| 1.4 | Resource Efficiency from an Economic Perspective | 5 CP (compulsory module) |

**2. Supplementary modules Research Methods and Soft Skills (∑ 10 CP)**

| | | |
|---|---|---|
| 2.1 | Research Methods | 2 CP (compulsory module) |

From the modules 2.2 to 2.13 modules of a scope of 8 CP in total have to be selected. Language modules in the own mother tongue are not eligible.

Students, whose mother tongue is not German and who do not have a proof of German language proficiency on level A1 according to Common European Reference Framework for Languages, are obliged to select the modules 2.2 and 2.3. Students, whose mother tongue is not German and who do not have a proof of German language proficiency on level A2 according to Common European Reference Framework for Languages, are obliged to select module 2.3.

| | | |
|---|---|---|
| 2.2 | German as foreign language I (level A1) | 4 CP (Compulsory elective module) |
| 2.3 | German as foreign language II (level A2) | 4 CP (Compulsory elective module) |
| 2.4 | German as foreign language III (level B1) | 4 CP (Compulsory elective module) |
| 2.5 | German as foreign language IV (level B2) | 4 CP (Compulsory elective module) |
| 2.6 | German as foreign language V (level C1) | 4 CP (Compulsory elective module) |
| 2.7 | English in study and science communication III (level C1) | 4 CP (Compulsory elective module) |
| 2.8 | English in study and science communication V (level C1) | 4 CP (Compulsory elective module) |
| 2.9 | English in study and science communication VI (level C1) | 4 CP (Compulsory elective module) |
| 2.10 | French I (level A1) | 4 CP (Compulsory elective module) |
| 2.11 | French II (level A2) | 4 CP (Compulsory elective module) |
| 2.12 | Spanish I (level A1) | 4 CP (Compulsory elective module) |
| 2.13 | Spanish II (level A2) | 4 CP (Compulsory elective module) |

**3. Profile modules Profile areas (∑ 40 CP)**

From the following four profile areas, one with the corresponding compulsory modules with a scope of 40 CP has to be selected:

**3.1 Hybrid Technologies**

| | | |
|---|---|---|
| 3.1.1 | Textile Process Chains | 5 CP (Compulsory module) |
| 3.1.2 | Applied Modelling and Simulation in Solid Mechanics I | 5 CP (Compulsory module) |
| 3.1.3 | Surface and Interface Engineering | 5 CP (Compulsory module) |
| 3.1.4 | Complex Materials for Manufacturing | 5 CP (Compulsory module) |
| 3.1.5 | Calculation of Anisotropic Composite Materials | 5 CP (Compulsory module) |
| 3.1.6 | Composite-based Hybrid Technologies | 5 CP (Compulsory module) |
| 3.1.7 | Polymer-based Hybrid Structures | 5 CP (Compulsory module) |
| 3.1.8 | Forming Process Chains | 5 CP (Compulsory module |

**3.2 Printed Functionalities**

| | | |
|---|---|---|
| 3.2.1 | Printing and Processes I | 5 CP (Compulsory module) |
| 3.2.2 | Printed Electronics & Special Topics of Functional Printing | 5 CP (Compulsory module) |
| 3.2.3 | Surface and Interface Engineering | 5 CP (Compulsory module) |
| 3.2.4 | Automotive Sensor Systems | 5 CP (Compulsory module) |
| 3.2.5 | Printing and Processes II | 5 CP (Compulsory module) |
| 3.2.6 | Media Physics | 5 CP (Compulsory module) |
| 3.2.7 | Research Lab | 5 CP (Compulsory module) |
| 3.2.8 | Advanced Surfaces, Thin Films and Interfaces | 5 CP (Compulsory module) |

**3.3 Work Design and Sustainability Management**

| | | |
|---|---|---|
| 3.3.1 | Resource Management: Challenges for Political Processes | 5 CP (Compulsory module) |
| 3.3.2 | Life Cycle Engineering | 5 CP (Compulsory module) |
| 3.3.3 | Life Cycle-oriented Management | 5 CP (Compulsory module) |
| 3.3.4 | Sustainability Management/Environmental Management Accounting | 5 CP (Compulsory module) |
| 3.3.5 | IT-supported Evaluation of Material Flows and Process Chains | 5 CP (Compulsory module) |
| 3.3.6 | Innovation and Value Creation | 5 CP (Compulsory module) |
| 3.3.7 | Digital Ergonomics | 5 CP (Compulsory module) |
| 3.3.8 | Instrumentation | 5 CP (Compulsory module) |

**3.4 Production Systems**

| | | |
|---|---|---|
| 3.4.1 | Joining Technologies and Strategies | 5 CP (Compulsory module) |
| 3.4.2 | Forming Process Chains | 5 CP (Compulsory module) |
| 3.4.3 | Machining Technologies | 5 CP (Compulsory module) |
| 3.4.4 | Efficient Process Chains | 5 CP (Compulsory module) |
| 3.4.5 | Geometrical Product Specification and Verification | 5 CP (Compulsory module) |

| | | |
|---|---|---|
| 3.4.6 | Technologies for Machine Tools | 5 CP (Compulsory module) |
| 3.4.7 | Composite-based Hybrid Technologies | 5 CP (Compulsory module) |
| 3.4.8 | Complex Materials for Manufacturing | 5 CP (Compulsory module) |

**4. Supplementary modules Elective Courses (∑ 10 CP)**
From the not-selected profile areas modules not selected yet with a scope of 10 CP have to be selected.

**5. Research module**

| | | |
|---|---|---|
| 5 | Research Project/Internship | 10 CP (Compulsory module) |

**6. Module Master Thesis**

| | | |
|---|---|---|
| 6 | Master Project with colloquium | 30 CP (Compulsory module) |

(2) The recommended structure of studies within the Master degree program Advanced Manufacturing at Chemnitz University of Technology in the frame of the standard period of study is based on the chronological structure of the program schedule document (see annex 1) and the modular structure of the degree program.

**§ 7**

**Contents of the degree program**

(1) In the basic modules Advanced Manufacturing, fundamental mathematical basic knowledge for the further studies are taught at the beginning of studies. In addition, the students get a first overview of different future-oriented manufacturing methods and bring them in correlation with current questions regarding the availability of resources. The supplementary modules Research Methods and Soft Skills serve to the methodological preparation for independant scientific works. Within the profile modules, the students have the choice between four profile areas for deepening their scientific knowledge. In addition, within the supplementary modules Elective Courses several modules of other profile areas can be selected according to the individual interests. Based on the scientific and methodological abilities acquired, the students work in the second year on an own research topic in academic or industrial context and complete their studies by the Master Thesis.
(2) Contents, objectives, teaching methods, credit points, examinations as well as frequency and duration of the modules are fixed in the module descriptions (see Annex 2)

## Part 3
## Conduct of the degree program

**§ 8**
**Course Guidance Service**

(1) Alongside Chemnitz University of Technology's Central Course Guidance Service, there is also a faculty student guidance service. The Faculty Board for the Faculty of Mechanical Engineering appoints a faculty member to provide this advisory service.
(2) It is recommended in particular that students seek advice from the course guidance service in the following cases:

1. prior to the start of the degree program,
2. prior to a stay for studies abroad,
3. prior to an internship,
4. in case of change of degree program or university,
5. after having failed in examinations.

**§ 9**
**Examinations**

Regulations relating to examinations are laid out in the Examination Regulations for the English-speaking consecutive degree program in Advanced Manufacturing leading to the award of the degree Master of Science (M.Sc.) at Chemnitz University of Technology.

## § 10
## Independent studies, distance learning and part-time studies

(1) Students should prepare for the classes that they will attend and should develop their knowledge further through independent study. The knowledge and skills required to complete the program successfully will not be gained exclusively through attending classes. Indeed, additional private study will be necessary (independent study).

(2) Distance learning or part-time study are not provided.

# Part 4
# Final Provisions

## § 11
## Entry into force and publication, Transitional Regulations

This study regulations apply to all students enrolled in the degree program from winter term 2018/2019 on.

To students who have started their studies within the degree program before winter term 2018/2019, the study regulations of the consecutive degree program Merge Technologies for Resource Efficiency leading to the award of Master of Science (M.Sc.) at Chemnitz University of Technology from August 4, 2015 (Amtliche Bekanntmachungen No. 37/2015, p. 1837), amended by article 1 of the statute from June 28, 2017 (Amtliche Bekanntmachungen No. 24/2017, p. 1106) continue to apply.

These Study Regulations enter into force on the day following their publication in the official publications ("Amtliche Bekanntmachungen") of Chemnitz University of Technology.

Issued the basis of a decision of the Faculty Board of the Faculty of Mechanical Engineering on May 28, 2018 and the approval of the University Management of Chemnitz University of Technology on June 6, 2018.

Chemnitz, June 13, 2018

The President
of Chemnitz University of Technology

Prof. Dr. Gerd Strohmeier