

## **Examination Regulations for the Diploma-postgraduate degree programme Mechanical Engineering**

From 17 January 2020

On the basis of § 34 paragraph 1 sentence 1 of the Saxon Higher Education Freedom Act (Sächsisches Hochschulfreiheitsgesetz) in the version of the announcement of 15 January 2013 (SächsGVBl. p. 3), Technische Universität Dresden enacts the following examination regulations as statutes.

### **Table of contents**

#### **Section 1: General provisions**

- § 1 Regulatory period of study and forms of implementation
- § 2 Examination structure
- § 3 Terms and deadlines
- § 4 General admission requirements and admission procedure
- § 5 Types of examination performance
- § 6 Exam papers
- § 7 Seminar papers and other corresponding written work
- § 8 Project work
- § 9 Oral examinations
- § 10 Papers
- § 11 Other examination performances
- § 12 Evaluation of examination performances, formation and weighting of grades, announcement of examination results
- § 13 Miss, withdrawal, deception, breach of order, waiver
- § 14 Pass and fail
- § 15 Free attempt
- § 16 Repeat of module examinations
- § 17 Crediting of study and examination achievements, periods of study and qualifications acquired outside a higher education institution
- § 18 Examination Board
- § 19 Examiners and assessors
- § 20 Purpose of the Diploma examination
- § 21 Purpose, Issue, Submission, Assessment and Repetition of the Diploma Thesis and colloquium
- § 22 Certificate and Diploma certificate
- § 23 Invalidity of the Diploma examination
- § 24 Insight into the examination documents

#### **Section 2: Subject-specific provisions**

- § 25 Study duration, structure and scope
- § 26 Subject-specific requirements for the Diploma examination
- § 27 Subject matter, type and scope of the Diploma examination
- § 28 Term of the thesis and duration of the colloquium
- § 29 Diploma degree

### **Section 3: Final provisions**

- § 30 Effectivity, Publication and Transitional Provisions

Annex: Modules of the elective compulsory area of the fields of study

## **Section 1: General provisions**

### **§ 1**

#### **Standard period of study and forms of implementation**

- (1) The standard period of study for the Diploma-postgraduate degree programme in Mechanical Engineering includes attendance, self-study and the Diploma examination.
- (2) The degree programme can be completed both as a face-to-face study programme and as a distance learning programme.

### **§ 2**

#### **Examination structure**

The Diploma examination consists of module examinations as well as the Diploma thesis and the colloquium. A module examination concludes a module and consists of at least one examination. The examinations are taken during the course of study.

### **§ 3**

#### **Deadlines and dates**

(1) The Diploma examination shall be taken within the standard period of study. A Diploma examination which has not been taken within four semesters after completion of the standard period of study shall be deemed to have been failed. A failed Diploma examination may be repeated once within one year. After expiry of this period, it shall be deemed to have been failed again. A second repeat examination is only possible at the next possible examination date, after which the Diploma examination is deemed to have been definitively failed.

(2) Module examinations shall be taken by the end of the respective semester specified by the study schedule.

(3) The Technische Universität Dresden shall ensure through the study regulations and the courses offered that study and examination achievements as well as the Diploma thesis and the colloquium can be taken within the set periods of time. The students shall be informed in good time, as is customary in the faculty, both about the type and number of study and examination achievements to be taken and about the dates on which they are to be taken, as well as about the submission and submission date of the Diploma thesis and the date of the colloquium. The students shall also be informed of the possibility of repeating each module examination.

(4) During maternity leave, no time limit begins to run and it is not counted towards current time limits. With regard to taking parental leave, reference is made to § 12 Paragraph 2 of the Matriculation Regulations.

### **§ 4**

#### **General admission requirements and admission procedure**

(1) Only those persons may be admitted to examinations for the Diploma examination pursuant to § 2 sentence 1 who

1. is enrolled in the Diploma-postgraduate degree programme in Mechanical Engineering at the Technische Universität Dresden and
2. has demonstrated the professional requirements (§ 26) and
3. has made a data-processing recorded declaration in respect of paragraph 4 number 3.

(2) The student must register for the performance of examinations. The student has the right to withdraw from examinations from the first to fourth semesters of the study plan up to a period of five working days, and from examinations from the fifth to ninth semesters of the study plan up to a period of three working days before an examination date without giving reasons. The form and deadline for registration as well as the form of deregistration are determined by the Examination Board and announced at the beginning of each semester in the usual manner of the faculty. The same applies to preliminary examinations and bonus achievements.

(3) The admission shall take place

1. to a module examination due to the first registration for an examination performance of this module examination,
2. for the Diploma thesis on the basis of the student's application for the issue of the topic or, in the case of § 21 paragraph 3 sentence 5, with the issue of the topic and
3. to the colloquium based on the assessment of the Diploma thesis with a grade of at least "sufficient" (4.0).

(4) Admission shall be refused if

1. the requirements referred to in paragraph 1 or the procedural requirements referred to in paragraph 2 are not fulfilled, or
2. the documents are incomplete or
3. the student has already definitively failed an examination required for the completion of the Diploma-postgraduate degree programme in Mechanical Engineering.

(5) The Examination Board decides on admission. The announcement may be made publicly. Section 18 (4) remains unaffected.

## **§ 5**

### **Types of examination performance**

(1) Examination performances shall be

1. written examinations (§ 6),
2. seminar papers and other appropriate written work (§ 7),
3. project work (§ 8),
4. oral examination performances (§ 9),
5. papers (§ 10) and/or
6. Other examination performances (§ 11)

to be performed. Written examinations using the multiple-choice (MC) method are possible. The conduct and assessment of the examinations are regulated in the MC regulations. In modules that are recognisably subject to several examination regulations, synonyms are permitted for examination performances with the same content.

(2) Studies and examinations must be completed in German or, according to the module descriptions, in English. If, according to the module description, a module primarily serves the acquisition of foreign-language qualifications, course and examination achievements may also have to be completed in the respective foreign language according to the assignment.

(3) If the student can credibly demonstrate that he or she is unable to take examinations in whole or in part in the prescribed form due to a long-term or permanent physical disability or chronic illness, the chairperson of the Examination Board shall, upon request, allow the student to take the examinations within an extended processing time or in an equivalent manner (compensation for disadvantages). For this purpose, the submission of a medical certificate and, in cases of doubt, an official medical certificate may be required. The same applies to preliminary examinations and bonus performances.

(4) If the student can credibly demonstrate that he/she is unable to complete examinations as prescribed due to the care of his/her own children up to the age of 14 or the care of close relatives 14 years of age or the care of close relatives, the chairperson of the Examination Board shall, upon application by the student, allow the student to take the examination in an equivalent manner. Close relatives are children, parents, grandparents, spouses and life partners. The chairperson of the Examination Board decides in consultation with the responsible examiner how the examination performance is to be carried out. The chairperson of the Examination Board decides on an appropriate measure to compensate for a disadvantage. Suitable measures to compensate for disadvantages include, for example, extended processing times, processing breaks, use of other media, use of other examination rooms within the university or another examination date. The same applies to preliminary examinations and bonus achievements.

## **§ 6**

### **Written examinations**

(1) In written examinations, the student shall prove that he/she can solve tasks and work on topics on the basis of the necessary basic knowledge in a limited time and with limited aids using the common methods of the subject of study. If written examinations or individual tasks are set according to § 5 Paragraph 1 Sentence 2, the student shall demonstrate the knowledge required to achieve the module objective. To this end, he or she must indicate which of the answers presented with the assignments he or she considers to be correct.

(2) Written examinations, the passing of which is a prerequisite for the continuation of studies, shall as a rule, but at least in the case of the last resit examination, be assessed by two examiners. The grade shall be the average of the individual grades pursuant to Section 12, Paragraph 1; only the first decimal place after the comma shall be taken into account, all other places shall be deleted without rounding. The assessment procedure shall not exceed four weeks.

(3) The duration of the written examinations is specified in each case in the module descriptions and may not be less than 90 minutes and not exceed 240 minutes.

## **§ 7**

### **Seminar papers and other appropriate written work**

(1) Through seminar papers, the student is to demonstrate the competence of being able to work on selected questions within a limited period of time on the basis of the specialist literature and other working materials. Furthermore, it is to be determined whether the student has the basic techniques of scientific work. Other corresponding written work, namely papers, are equivalent to seminar papers.

(2) For seminar papers and other corresponding written work, § 6 paragraph 2 shall apply accordingly.

(3) Seminar papers and other corresponding written work may have a maximum duration of 210 hours. The concrete scope is specified in each case in the module descriptions. Derived from this, the deadline for submission is to be determined within the framework of the assignment.

(4) Seminar papers and other corresponding written work may also be submitted in the form of group work if the student's individual contribution to be assessed as seminar papers and other corresponding written work is clearly distinguishable and assessable on the basis of the indication of sections, page numbers or other objective criteria that enable a clear delimitation.

## **§ 8**

### **Project work**

(1) Project work usually demonstrates the ability to work in a team and in particular to develop, implement and present concepts. In this context, the student shall demonstrate the competence to define goals on a larger task and to develop interdisciplinary approaches to solutions and concepts.

(2) For project work, § 6 paragraph 2 shall apply accordingly.

(3) The temporal scope of the project work is determined in each case in the module descriptions and amounts to a maximum of 450 hours. Derived from this, the deadline for submission is to be set within the framework of the assignment. In individual cases, the Examination Board may exceptionally extend this deadline for submission by a maximum of 8 weeks upon justified application by the student.

(4) In the case of project work carried out in the form of teamwork, the individual contributions must be clearly recognisable and assessable and must fulfil the requirements according to Paragraph 1. If parts of the project work are performed orally, § 9 Paragraph 4 Sentence 1 shall apply accordingly.

## **§ 9**

### **Oral examination performances**

(1) By means of oral examinations, the student shall demonstrate the competence to recognise the interrelationships of the examination area and to be able to classify special questions in these interrelationships. Furthermore, it is to be determined whether the student has a basic knowledge corresponding to the state of the studies.

(2) Oral examinations are generally taken in front of at least two examiners (peer examination) or in front of one examiner in the presence of an expert assessor (§ 19) in accordance with the module descriptions as a group examination with up to four persons or as an individual examination.

(3) Oral examinations have a duration of 15 to 45 minutes. The concrete duration is specified in the respective module descriptions.

(4) The essential items and results of the oral examination performance shall be recorded in a protocol. The result shall be made known to the student following the oral examination performance.

(5) Students who wish to take the same examination at a later date shall be admitted as listeners within the framework of the spatial conditions, unless the student to be examined objects. Admission does not extend to the discussion and announcement of the examination results.

## **§ 10 Papers**

(1) By means of presentations, the student shall demonstrate the competence to prepare special questions and also to be able to present them according to the assignment.

(2) § 6 Paragraph 2 shall apply accordingly. The lecturer responsible for the course in which the paper is handed out and, if applicable, presented, shall be one of the examiners. If the paper is presented, § 9 Paragraph 4 Sentence 1 shall apply accordingly.

(3) The time required to complete the papers is specified in the respective module descriptions and amounts to a maximum of 30 hours. Derived from this, the deadline for submission or presentation is to be determined within the scope of the assignment.

## **§ 11 Other examination performances**

(1) The student shall achieve the specified performance by means of other controlled examination performances (other examination performances) which can be assessed according to the same standards and which are specifically specified in the module descriptions, including the requirements as well as the duration or the temporal scope. If a time scope is specified, the deadline for submission is to be determined from this within the framework of the assignment. Other examination performances are protocol collections, laboratory practicals, papers, presentations, written tests and oral tests.

(2) The other examination performances according to paragraph 1 are defined as follows:

1. In protocol collections, the student should be able to demonstrate the competence to document and critically reflect on the course of practical tasks from technical or analytical issues and the results achieved in an appropriate manner.
2. In the laboratory practical course, the student demonstrates his or her competence in the proper and effective use of equipment and apparatus for the investigation of a specific scientific-technical subject area.
3. In assignments, the student should prove by solving written exercises, by working on electronic learning modules or by limited experimental work that the student has mastered subtasks or can solve analytical tasks and is capable of interpreting the results accordingly.
4. The presentation is an oral or media-supported lecture by one student or, according to the assignment, in the case of definable individual contributions by several students, in which results achieved through independent work are presented in a structured form, usually using visual aids.
5. In written tests, students are to demonstrate the basic knowledge of the subject by solving smaller tasks in a limited amount of time.
6. In oral tests, students are to prove their basic knowledge of the subject by answering definable questions.

(3) For other written examinations, § 6 paragraph 2 shall apply accordingly. For other non-written examinations, § 9 paragraph 2 and 4 shall apply accordingly.

## § 12

### **Assessment of the examination performances, formation and weighting of the grades, Announcement of the examination results**

(1) The marks for the individual examination performances shall be determined by the respective examiners, taking into account any bonus points acquired in accordance with Paragraph 2. The following grades shall be used for this purpose:

1 = very good=	an excellent performance;
2 = good=	a performance that is significantly above the average requirements;
3 = satisfactory=	a performance that meets average requirements;
4 = sufficient=	a performance that still meets the requirements despite its shortcomings;
5 = not sufficient=	a performance that no longer meets the requirements due to significant deficiencies.

For differentiated assessment, individual grades can be raised or lowered by 0.3 to intermediate values; the grades 0.7, 4.3, 4.7 and 5.3 are excluded. An individual examination performance is only assessed as "passed" or "failed" (ungraded examination performance) if the corresponding module description provides for this by way of exception. Ungraded examination performances graded with "passed" are not included in the further grade calculation; ungraded examination performances graded with "failed" are included in the further grade calculation with the grade 5 (not sufficient).

(2) Bonus points can be acquired voluntarily for assigned examination achievements through certain study achievements (bonus achievements). Bonus points can replace a maximum of 6 % of the total number of points of the assigned examination performance in addition to the assessment points acquired by the student, if the examination performance was assessed with at least "sufficient" (4.0). The type and structure of the bonus performances as well as their assignment to an examination performance are to be regulated in the module descriptions. The number of bonus points to be acquired through a bonus performance as well as the total number of points to be achieved in the associated examination performance shall be announced at the beginning of each semester as is customary in the faculty. Bonus points earned are only taken into account in the examination date that is binding for the student following the bonus performance.

(3) The module grade results from the weighted average of the grades of the examination performances of the module according to the module description, if applicable. Only the first decimal place after the comma is taken into account, all other places are deleted without rounding. The module grade with an average is

up to and including 1.5	= very good,
from 1.6 to 2.5 inclusive	= good,
from 2.6 to 3.5 inclusive	= satisfactory,
from 3.6 up to and including 4.0	= sufficient,
from 4.1	= not sufficient.

If a module examination is not passed due to a pass-relevant examination performance according to § 14 Paragraph 1 Sentence 2, the module grade is "insufficient" (5.0).

(4) An overall grade is calculated for the Diploma examination. The final grade of the Diploma examination shall include the final grade of the Diploma thesis with a 45-fold weighting and the



module grades weighted according to the credit points according to § 27 paragraph 1. The final grade of the Diploma thesis is made up of the grade of the Diploma thesis with a quadruple weight and the grade of the colloquium with a single weight. Paragraph 2, sentences 2 and 3 shall apply accordingly to the overall and final grades. The overall grade of the Diploma examination shall be "passed with distinction" in the case of outstanding performance (with an average up to and including 1.2 as well as the final grade of the Diploma thesis up to and including 1.5).

(5) The overall grade of the Diploma examination is additionally shown as a relative grade according to the ECTS grading scale.

(6) The modalities for the announcement of the examination results shall be communicated to the students through the usual faculty publication.

### **§ 13**

#### **Default, withdrawal, deception, breach of order, waiver**

(1) An examination performance shall be deemed to have been assessed as "insufficient" (5.0) or "failed" if the student misses an examination date that is binding for him/her without good reason or withdraws without good reason. The same applies if an examination performance is not completed within the specified processing time.

(2) The reason asserted for the withdrawal or the failure to attend must be notified to the examination office in writing without delay and must be made credible. In the case of illness of a student, a medical certificate is usually to be submitted, in cases of doubt a medical certificate from an official doctor. Insofar as compliance with deadlines for the initial registration for examinations, the repetition of examinations, the reasons for missing examinations and compliance with processing times for examination papers are affected, the illness of the student shall be deemed equivalent to the illness of a child for whom he/she is predominantly solely responsible. If the reason is recognised, a new date shall be set. In this case, the examination results already available shall be taken into account. The Examination Board decides on the approval of the withdrawal or the recognition of the reason for missing the examination.

(3) If the student attempts to influence the result of his/her examination performance by cheating, for example by bringing or using unauthorised aids, the examination performance in question shall be deemed to have been assessed as "insufficient" (5.0) on the basis of a corresponding determination by the Examination Board. Accordingly, ungraded examinations are deemed to have been assessed as "failed". A student who disturbs the orderly course of the examination can be excluded from the continuation of the examination by the respective examiner or the respective invigilator; in this case, the examination performance is deemed to be graded as "insufficient" (5.0) or "failed". In serious cases, the Examination Board may exclude the student from taking further examinations.

(4) If the student has deceived in an examination and this fact only becomes apparent after the assessment has been announced, the assessment of the examination may be changed by the Examination Board to "not sufficient" (5.0) or "not passed" and thereupon the grade of the module examination may also be changed in accordance with § 12, paragraph 3. If the requirements for taking a module examination were not fulfilled without the student intending to deceive, this defect shall be remedied by passing the module examination. If the student has intentionally obtained the taking of a module examination wrongly, the Examination Board may declare the module examination "insufficient" (5.0) or "failed". In serious cases, the Examination Board may exclude the student from taking further examinations.

(5) Paragraphs 1 to 4 apply accordingly to preliminary examinations, bonus examinations, the Diploma thesis and the colloquium.

(6) If the student declares in writing to the examination office that he/she waives the completion of an examination, this examination shall be deemed to have been assessed as "insufficient" (5.0) or "failed" in the respective examination attempt. The waiver is irrevocable and requires admission according to § 4.

#### **§ 14** **Pass and fail**

(1) A module examination is passed if the module grade is at least "sufficient" (4.0). In the cases specified by the module descriptions, the passing of the module examination is furthermore dependent on the assessment of individual examination performances with at least "sufficient" (4.0). If the module examination is passed, the credit points assigned to the module in the module description are acquired.

(2) The Diploma examination is passed if the module examinations and the Diploma thesis as well as the colloquium have been passed. The Diploma thesis and the colloquium are passed if they have been assessed with at least "sufficient" (4.0).

(3) A module examination is not passed if the module grade is not at least "sufficient" (4.0). Diploma thesis and colloquium are not passed if they have not been assessed with at least "sufficient" (4.0).

(4) A module examination is finally failed if the module grade is not at least "sufficient" (4.0) and its repetition is no longer possible or a preliminary examination comprised by the module examination is not passed and can no longer be repeated. Diploma thesis and colloquium are definitively failed if they have not been assessed with at least "sufficient" (4.0) and a repetition is no longer possible.

(5) The Diploma examination is failed or definitively failed if either a module examination, the Diploma thesis or the colloquium is failed or definitively failed. § 3 paragraph 1 remains unaffected. In the case of a final failure of a module examination of the compulsory elective area, the final failure of the Diploma examination shall only be decided in accordance with § 18, paragraph 4, if the student does not change his/her choice within one month after the announcement of the result of the module examination or does not make a change of choice in accordance with Section 6, Paragraph 2, Sentence 4 of the Study Regulations is no longer possible. If the student has definitively failed the Diploma examination, he or she loses the examination entitlement for all components of the Diploma examination according to § 2, sentence 1.

(6) If the student has failed a module examination, the Diploma thesis or the colloquium, the student shall be informed whether and, if so, to what extent and within what period of time the examination in question may be repeated.

(7) If the student has not passed the Diploma examination, a certificate shall be issued to him/her on application and on presentation of the relevant evidence as well as the exmatriculation certificate, which contains the examination components performed and their evaluation as well as, if applicable, the examination components still missing and which shows that the Diploma examination has not been passed.

**§ 15**  
**Free trial**

(1) Module examinations can also be taken before the semesters specified in the study schedule if the admission requirements are met. Taking the module examination for the first time is then considered a free attempt.

(2) At the request of the student, module examinations or examinations graded at least "sufficient" (4.0) can be repeated once at the next regular examination date in order to improve the grade. In these cases, the better grade counts. The form and deadline of the application are determined by the Examination Board and announced in the usual manner of the faculty. After the expiry of the next regular examination date or the application deadline, an improvement of the grade is no longer possible. When repeating a module examination to improve the grade, examination performances that were assessed with at least "sufficient" (4.0) in the free attempt are credited upon application by the student; examination performances that were assessed with "passed" in the free attempt are credited ex officio.

(3) A module examination that has not been passed in the free attempt shall be deemed not to have been taken. Examination performances that were assessed with at least "sufficient" (4.0) or with "passed" are credited in the following examination procedure. If the possibility of grade improvement according to Paragraph 2 is used for examination performances, the better grade shall be credited.

(4) In addition to § 3, paragraph 4, periods of interruption of studies due to a prolonged illness of the student or a child to be cared for by the student as well as periods of study abroad shall not be taken into account for the application of the free attempt regulation.

**§ 16**  
**Repetition of module examinations**

(1) Failed module examinations can be repeated once within one year after completion of the first examination attempt. The period begins with the announcement of the first failure of the module examination. After expiry of this period, they are deemed to have been failed again.

(2) A second resit examination can only be taken at the next possible examination date. After this date, the module examination is deemed to have been definitively failed. A further repeat examination is not permitted.

(3) The repetition of a failed module examination consisting of several examinations shall only include the examinations not graded with at least "sufficient" (4.0) or with "passed". When repeating a failed module examination that comprises one or more optional examination performances, students are not bound to the previous choice of an examination performance that was not assessed with at least "sufficient" (4.0) or with "passed".

(4) The repetition of a passed module examination is only permitted in the case regulated in § 15 Paragraph 2 and includes all examination performances.

(5) Failed attempts of the module examination from the same or other degree programmes are carried over.

## § 17

### **Crediting of study and examination achievements, periods of study and qualifications acquired outside a higher education institution**

(1) Study and examination achievements which have been completed at a higher education institution shall be credited upon application by the student, unless there are significant differences with regard to the competences acquired. Further agreements of the Technische Universität Dresden, the German Rectors' Conference, the Standing Conference of the Ministers of Education and Cultural Affairs as well as those ratified by the Federal Republic of Germany shall be observed, if applicable.

(2) Qualifications acquired outside of a university shall be credited upon application of the student if they are equivalent. Equivalence is given if the content, scope and requirements essentially correspond to parts of the studies in the Diploma-postgraduate degree programme in Mechanical Engineering at the Technische Universität Dresden. No schematic comparison is to be made, but rather an overall consideration and evaluation.

(3) Study and examination credits obtained in the Federal Republic of Germany in the same degree programme shall be transferred ex officio.

(4) Study and examination achievements completed at a higher education institution may be credited despite substantial differences if, due to their contents and qualification objectives, they correspond overall to the sense and purpose of an elective option available in this degree programme and therefore form a structural equivalent. The actual achievements are shown in the transcript.

(5) If study and examination achievements are credited or transferred in accordance with paragraph 1, 3 or 4 or qualifications acquired outside a higher education institution are credited in accordance with paragraph 2, the corresponding periods of study shall also be credited ex officio. Grades shall - insofar as the grading systems are comparable - be taken over and included in the further formation of grades. In the case of incomparable grading systems, the remark "passed" shall be included; they shall not be included in the further formation of grades. The credit will be marked on the certificate.

(6) Credit shall be awarded by the Examination Board. The student must submit the required documents. From this point on, the crediting procedure may not exceed a period of two months. In the case of non-credit, § 18 Paragraph 4 Sentence 1 shall apply.

**§ 18**  
**Audit Committee**

(1) An Examination Board shall be formed for the postgraduate Diploma degree programme in Mechanical Engineering to conduct and organise the examinations and for the tasks assigned by the examination regulations. The Examination Board shall consist of five professors, two research assistants and two students. With the exception of the student members, the term of office is three years. The term of office of the student members is one year.

(2) The chairperson, the deputy chairperson as well as the other members and their deputies shall be appointed by the Faculty Council of the Faculty of Mechanical Science and Engineering, the student members upon proposal of the Student Council. They should be enrolled in one of the degree programmes of the Faculty of Mechanical Science and Engineering. As a rule, the chairperson conducts the business of the Examination Board.

(3) The Examination Board shall ensure that the provisions of the examination regulations are observed. It regularly reports to the faculty on the development of examination and study times, including the actual processing times for the Diploma thesis, as well as on the distribution of module and overall grades. The Examination Board gives suggestions for reforming the examination regulations, the study regulations, the module descriptions and the study schedule.

(4) The student concerned shall be informed in writing of any adverse decisions, the reasons for them and instructions on how to appeal. As the examination authority, the Examination Board shall decide on appeals within a reasonable period of time and issue the appeal notices.

(5) The Examination Board may admit guests to its meetings without voting rights. The members of the Examination Board shall have the right to attend the taking of the examinations and the colloquium.

(6) The members of the Examination Board and their deputies shall be bound by official secrecy. If they are not public servants, they shall be bound to secrecy by the chairperson.

(7) Based on the decisions of the Examination Board, the examination office organises the examinations and administers the examination files.

**§ 19**  
**Examiners and assessors**

(1) The Examination Board shall appoint university lecturers and other persons who are entitled to take examinations according to Land law as examiners. Only persons who have successfully passed the corresponding Diploma examination or an at least comparable examination shall be appointed as assessors.

(2) The student may propose the supervisor for his/her thesis and the examiners for oral examinations and the colloquium. The suggestion does not constitute a claim.

(3) The names of the examiners shall be made known to the student in good time.

(4) Section 18 (6) shall apply accordingly to the examiners and assessors.

## § 20

### **Purpose of the Diploma examination**

Passing the Diploma examination constitutes the professionally qualifying degree of the degree programme. This establishes that the student has an overview of the subject-related contexts, has the ability to apply scientific methods and findings, and has acquired the thorough specialist knowledge necessary for the transition to professional practice.

## § 21

### **Purpose, Issue, Submission, Assessment and Retake of the Diploma Thesis and colloquium**

(1) The Diploma thesis shall show that the student is able to independently work on problems of the field of study according to scientific methods within a given period of time.

(2) The Diploma thesis may be supervised by a university lecturer or another person authorised to conduct examinations according to the Saxon Higher Education Freedom Act (Sächsisches Hochschulfreiheitsgesetz), provided that this person works at the Faculty of Mechanical Science and Engineering at the Technische Universität Dresden. If the Diploma thesis is to be supervised by a person who works outside the Faculty of Mechanical Science and Engineering and is authorised to do so, the approval of the chairperson of the Examination Board is required.

(3) The topic of the Diploma thesis shall be issued by the Examination Board. The topic and the date of issue shall be recorded in the records. The student may express wishes regarding the topic. At the request of the student, the Examination Board shall arrange for the timely issue of the topic of the Diploma thesis. The topic shall be issued by the Examination Board ex officio at the latest at the beginning of the semester following the completion of the last module examination.

(4) The topic may only be returned once and only within two months of issue. However, the topic may only be returned in the case of a repetition of the Diploma thesis if the student has not made use of this possibility so far. If the student has returned the topic, a new one shall be issued to him/her immediately in accordance with Paragraph 3, Sentences 1 to 3.

(5) The Diploma thesis may also be produced in the form of a group thesis if the individual contribution to be assessed as the student's Diploma thesis is clearly distinguishable and assessable on the basis of the specification of sections, page numbers or other objective criteria that enable a clear demarcation and fulfils the requirements according to paragraph 1.

(6) The Diploma thesis shall be submitted in German in two typed and bound copies as well as in digital text form on a suitable data carrier to the examinations office in due time; the date of submission shall be recorded in the records. In suitable cases, the thesis may be submitted in English upon application by the student to the Examination Board. When handing in the thesis, the student must declare in writing whether he/she has written his/her thesis - in the case of a group thesis, his/her correspondingly marked part of the thesis - independently and has not used any sources and aids other than those indicated.

(7) The Diploma thesis shall be graded individually by two examiners in accordance with § 12, paragraph 1, sentences 1 to 3. The supervisor of the thesis shall be one of the examiners. The assessment procedure shall not exceed four weeks.

(8) The grade of the Diploma thesis shall be the average of the two individual grades of the examiners. If the individual grades of the examiners differ by more than two grade levels, the average of the two individual grades shall only be decisive if both examiners agree. If this is not the case, the Examination Board shall obtain an assessment from a further examiner. The grade of the thesis shall then be calculated from the average of the three individual grades. Section 12, Paragraph 3, Sentences 2 and 3 shall apply accordingly.

(9) If one examiner has assessed the thesis with at least "sufficient" (4.0) and the other examiner with "insufficient" (5.0), the Examination Board shall obtain an assessment from another examiner. This examiner decides whether the thesis has been passed or not. If it is thus deemed to have been passed, the grade of the thesis shall be formed from the average of the individual grades of the evaluations voting for passing, otherwise from the evaluations voting for failing. Section 12, Paragraph 3, Sentences 2 and 3 shall apply accordingly.

(10) A failed Diploma thesis may be repeated once within one year. After expiry of this period, it shall be deemed to have been failed again. A second repetition is only possible on the next possible examination date, after which it is deemed to have been definitively failed. A further repetition or the repetition of a passed Diploma thesis is not permitted.

(11) The student must explain his/her thesis in a public colloquium before the thesis supervisor as examiner and an assessor. Through the colloquium, the student should prove that he or she can present the result of the thesis conclusively and discuss it professionally. Additional examiners may be consulted. Paragraph 10 as well as § 9 Paragraph 4 and § 12 Paragraph 1 Sentences 1 to 3 shall apply accordingly.

## **§ 22**

### **Certificate and Diploma**

(1) The student shall receive a certificate of the passed Diploma examination without delay, if possible within four weeks. The certificate of the Diploma examination shall include the module evaluations according to § 27 paragraph 1 as well as the corresponding credit points and, if applicable, credit marks, the topic of the Diploma thesis, its final grade and supervisor as well as the overall grade according to § 12 paragraph 4 and 5. The grades of the individual examinations as well as the topic of the project thesis shall be shown on an enclosure to the transcript. At the request of the student, the assessments of additional modules and the subject study duration required until completion of the Diploma examination shall be included in the certificate and the assessments of examination performances in additional modules shall be indicated on the supplement.

(2) At the same time as the Diploma certificate, the student shall receive the Diploma certificate with the date of the certificate. This certifies the award of the Diploma degree. The Diploma certificate is signed by the chairperson of the Examination Board, bears the handwritten or typewritten signature of the rector and bears the seal of the Technische Universität Dresden. In addition, translations of the certificate and the transcript in English are handed out to the student.

(3) The certificate shall bear the date of the day on which the last examination component pursuant to § 14, paragraph 2 has been completed. It is signed by the chairperson of the Examination Board and the dean of the Faculty of Mechanical Science and Engineering and bears the seal of the Technische Universität Dresden.

(4) The Technische Universität Dresden issues a Diploma Supplement (DS) according to the "Diploma Supplement Model" of the European Union/Council of Europe/UNESCO. The text agreed between the Standing Conference of the Ministers of Education and Cultural Affairs of the State in the Federal Republic of Germany and the German Rectors' Conference shall be used as the representation of the national education system (DS section 8).

### **§ 23**

#### **Invalidity of the Diploma examination**

(1) If the student has cheated in an examination and this fact only becomes known after the certificate has been issued, the assessment of the examination may be changed in accordance with § 13, paragraph 4, sentence 1. If necessary, the Examination Board may declare the module examination "insufficient" (5.0) and the Diploma examination "failed". The same applies to the Diploma thesis and the colloquium.

(2) If the requirements for taking an examination were not fulfilled without the student intending to deceive, and if this fact only becomes known after the certificate has been issued, this defect shall be remedied by passing the examination. If the student has intentionally wrongfully obtained the passing of an examination performance, the Examination Board may declare the examination performance with the module examination as "not sufficient" (5.0) and the Diploma examination as "not passed". The same applies to the Diploma thesis and the colloquium.

(3) An incorrect certificate and its translation shall be confiscated by the chairperson of the Examination Board and, if necessary, reissued. The Diploma certificate, all translations and the Diploma Supplement shall be withdrawn together with the incorrect Diploma certificate if the Diploma examination was declared "failed" due to deception. A decision in accordance with paragraph 1 and paragraph 2 sentence 2 or 3 shall be excluded after a period of five years from the date of the certificate.



## **§ 24**

### **Inspection of the examination documents**

Within one year after completion of the examination procedure, the student shall be granted access to his/her written examination papers, the related reports and the examination records within a reasonable period of time upon request.

## **Section 2: Subject-specific provisions**

## **§ 25**

### **Duration, structure and scope of studies**

(1) The standard period of study according to § 1 is five semesters.

(2) The degree programme is modular and concludes with the Diploma thesis and the colloquium. Eight fields of study, one of which must be chosen, are available for the acquisition of special competences. In the distance learning programme, four fields of study are available, General and Structural Mechanical Engineering, Power Engineering, Aerospace Engineering and Production Engineering, one of which must be chosen.

(3) By passing the Diploma examination, a total of 150 credit points are acquired in the modules as well as the Diploma thesis and the colloquium.

## **§ 26**

### **Subject-specific requirements for the Diploma examination**

(1) For the examinations, coursework may be required as prerequisite examinations. The number, type and structure of these are to be regulated in the module descriptions, and the number of repetition options can also be limited. Prior to the colloquium, the Diploma thesis must have been assessed with a grade of at least "sufficient" (4.0).

(2) At least 98 credit points must have been acquired before the topic of the Diploma thesis is issued.

## **§ 27**

### **Subject, type and scope of the Diploma examination**

(1) The Diploma examination comprises all module examinations of the compulsory area and those of the selected modules of the compulsory elective area as well as the Diploma thesis and the colloquium.

(2) Modules of the compulsory area are

1. Research Internship
2. Interdisciplinary Technical Qualification of Mechanical Engineering.

(3) The compulsory elective area comprises the fields of study

1. General and Structural Mechanical Engineering

2. Power Engineering
3. Automotive and Railway Vehicle Engineering
4. Lightweight Engineering
5. Aerospace Engineering
6. Production Engineering
7. Simulation Methods in Mechanical Engineering
8. Processing Machines and Textile Machines Engineering.

One of eight and, taking into account § 25 Paragraph 2 Sentence 3, one of four fields of study as well as the modules in accordance with the annex must be selected.

(4) The required examinations assigned to the modules, their type and design are specified in the module descriptions. Unless otherwise specified in the module descriptions, the subject of the examinations is the content and the competences to be acquired in the module.

(5) The student may take an examination in modules other than those provided for in paragraph 1 (additional modules). These module examinations can be optionally taken from the entire range of modules offered by the Technische Universität Dresden or a cooperating university after consultation with the respective provider or the examiner. They are not included in the calculation of the student workload and are not taken into account in the formation of the overall grade.

## **§ 28**

### **Processing time of the Diploma thesis and duration of the colloquium**

(1) The processing time of the Diploma thesis is 20 weeks, 27 credit points are acquired. The topic, task and scope of the Diploma thesis shall be limited by the supervisor in such a way that the deadline for submission of the Diploma thesis can be met. In individual cases, the Examination Board may exceptionally extend the processing time by a maximum of two months upon justified application by the student; the number of credit points remains unaffected by this.

(2) The colloquium has a duration of 60 minutes. Three credit points are earned.

## **§ 29**

### **Diploma degree**

If the Diploma examination is passed, the degree of "Diplom-Ingenieurin" or "Diplom-Ingenieur" (abbreviated: "Dipl.-Ing.") is awarded.

### **Section 3: Final provisions**

#### **§ 30**

#### **Entry into force, publication and transitional provisions**

(1) These examination regulations shall enter into force on 1 April 2020 and shall be published in the Official Announcements of Technische Universität Dresden.

(2) It shall apply to all students newly enrolled in the Diploma-postgraduate degree programme in Mechanical Engineering in the winter semester 2020/2021 or later.

(3) For students enrolled earlier than the winter semester 2020/2021, the examination regulations for the Diploma-postgraduate degree programme in Mechanical Engineering previously valid for them before the entry into force of these regulations shall continue to apply.

(4) In derogation of subsection 3, section 18, subsection 1, sentence 2 shall apply to all students enrolled in the Diploma-postgraduate degree programme in Mechanical Engineering as of the winter semester 2020/2021 or later.

(5) These examination regulations shall apply from the winter semester 2021/2022 for all students enrolled in the Diploma-postgraduate degree programme in Mechanical Engineering.

(6) In the case of transfer according to Paragraph 5, the module examinations already taken, including the grades, shall be taken over ex officio, and individual examination performances shall be taken over subordinately on the basis of equivalence tables which are determined by the Examination Board and announced in the customary manner of the faculty. With the exception of § 16 Paragraph 5, module examinations and examinations not graded with at least "sufficient" (4.0) or "passed" shall not be transferred. As a rule, the module grade is not recalculated on the basis of the grades of exclusively transferred examinations; exceptions can be found in the equivalence tables.

Issued on the basis of the resolution of the Faculty Council of the Faculty of Mechanical Science and Engineering of 15 August 2018 and the approval of the Rectorate of 15 January 2019.

Dresden, 17 January 2020

The Rector  
of the Technische Universität Dresden

Prof. Dr.-Ing. habil. DEng/Auckland Hans Müller-Steinhagen

## **Annex:**

### **Modules of the compulsory elective area of the fields of study**

- A. In the field of study General and Structural Mechanical Engineering, compulsory elective modules are
1. Measurement and Automation Engineering
  2. Extended Fundamentals for Mechanical Engineering
  3. Fundamentals of Construction and Dynamic Dimensioning of Machines
  4. Fluid Power and Electrical Drive Systems
  5. Mechanical Drives
  6. Fundamentals of Heat and Mass Transfer
  7. Lightweight Materials
  8. Fibre-Reinforced Materials
  9. Production Engineering - Manufacturing Processes
  10. Production Engineering - Manufacturing and Planning
  11. Production Engineering - Machine Tools and Production Automatization
  12. Elastic Structures and Technical Fluid Mechanics
  13. Fundamentals of Processing and Textile Mechanical Engineering
  14. Analysis and Dimensioning
  15. Fluid Power Components and Systems
  16. Off-road Vehicle Technology - Systems
  17. Industrial Design Methodology
  18. Two-Dimensional Design Fundamentals
  19. Fibre Composites Technology
  20. Fundamentals of Power Machinery
  21. Intralogistics - Basics
  22. Fundamentals of Agricultural Systems Technology
  23. Tools and Methods of Product Development
  24. Three-Dimensional Design Fundamentals
  25. Fundamentals of Polymer Technology
  26. Manufacturing Processes - Advanced Course
  27. Machine Design and Diagnostics
- of which modules amounting to 60 credit points are to be selected, as well as
28. Intralogistics - System Design
  29. Fluid-Mechatronics in Mobile Applications
  30. Computational Engineering in Fluid Power
  31. Material Handling
  32. Mobile Machinery/Off-road Vehicle Technology – Analysis
  33. Human-centered Product Design
  34. Visualization Techniques
  35. Systems Engineering
- of which three are and
36. Simulation Methods in Drive Technology
  37. Design of Agricultural Systems Technology
  38. Fluid-Mechatronics in Industrial Applications
  39. Product Modelling
  40. Materials and Failure Analysis
  41. Virtual Methods and Tools
  42. Data Processing and Experimental Model Analysis
  43. Design Research
  44. Design of Product-Service-Systems
- of which three are to be elected.

- B. In the field of study Power Engineering, compulsory elective modules are
1. Measurement and Automation Engineering
  2. Extended Fundamentals for Mechanical Engineering
  3. Fluid Mechanics and Simulation Methods
  4. Process thermodynamics
  5. Fundamentals of Heat and Mass Transfer
  6. Fundamentals of Construction and Dynamic Dimensioning of Machines
  7. Fluid Power and Electrical Drive Systems
  8. Mechanical Drives
  9. Fundamentals of Internal Combustion Engines and Drive Systems
  10. Production Engineering - Manufacturing Processes
  11. Fundamentals of Power Machinery
  12. Fundamentals of Refrigeration and Air Conditioning
  13. Principles of Refrigeration and Air Conditioning
  14. Fluid Power Components and Systems
  15. Construction Materials and Structural Durability
  16. Advanced Course: Internal Combustion Engines
  17. Production Measurement Technology
  18. Experimental Fluid and Solid Mechanics
  19. Fundamentals of Non-Fossil Primary Energy Use
  20. Heat Exchanger, Piping, Pressure Vessels and Energy Storage
  21. Tools and Methods of Product Development
  22. Manufacturing Processes - Advanced Course
  23. Continuum Mechanics and Multifunctional Structures
  24. Multi-Body Dynamics and Computational Fluid Dynamics

of which modules amounting to 60 credit points are to be selected, whereby either the module Fundamentals of Refrigeration and Air Conditioning or the module Principles of Refrigeration and Air Conditioning can be selected, as well as

25. Turbocompressors
26. Machine Laboratory
27. Heat Supply
28. Energy and Load Management
29. Cryogenics
30. Heat Pumps, Organic Vapour Cycle Processes (ORC) and ORC Machines
31. Innovative Energy Storage Systems
32. Process Simulation and Validation in Power Engineering
33. Process Measurement Technology and Mathematical Methods of Measurement Data Processing
34. Thermo Hydraulics and Safety of Nuclear Facilities
35. Hydrogen Energy Technology
36. Load Management of Refrigeration Plants

of which three are to be chosen, whereby either the module Cryogenics or the module European Course of Cryogenics can be chosen, as well as

37. Steam and Gas Turbines
38. Turbo Pumps and Piston Working Machines
39. Building Energy Systems
40. Air Conditioning Systems/Supply Engineering
41. Evaluation of Energy Efficiency and Economy
42. Refrigeration Systems
43. International Refrigeration and Compressor Course
44. Mobile Refrigeration and Special Cooling Tasks

45. Renewable Energy Supply
46. Thermal Process Technology
47. Energy Systems Technology
48. Applied Molecular Thermodynamics
49. Properties and Thermodynamic Simulation
50. Gas Dynamics and Numerical Fluid Mechanics
51. Nuclear Reactor Engineering
52. Reactor Physics
53. European Course of Cryogenics

of which three must be chosen, whereby either the Refrigeration Systems module or the International Refrigeration and Compressor Course module or the Cryogenics module or the European Course of Cryogenics module can be chosen in each case.

C. In the field of study of Automotive and Railway Vehicle Engineering, elective compulsory modules are

1. Measurement and Automation Engineering
2. Extended Fundamentals for Mechanical Engineering
3. Fluid Power and Electrical Drive Systems
4. Fundamentals of Automotive Vehicle Engineering
5. Fundamentals of Internal Combustion Engines and Drive Systems
6. Fundamentals of Rail Vehicles
7. Fundamentals of Construction and Dynamic Dimensioning of Machines
8. Production Engineering - Manufacturing Processes
9. Production Engineering - Manufacturing and Planning
10. Fibre-Reinforced Materials
11. Construction Materials and Structural Durability
12. Advanced Course: Internal Combustion Engines
13. Electrical Drive and Control Systems
14. Diagnostics and Acoustics
15. Mobile Refrigeration and Special Cooling Tasks
16. Connected Mechatronic Systems
17. Full Vehicle Functions in Automotive Vehicle Engineering
18. Traction Mechanics
19. Supporting Structures of Rail Vehicles
20. Tools and Methods of Product Development

of which modules amounting to 60 credit points are to be selected, as well as

21. Design and Optimization of Vehicle Systems
22. Simulation Methods in Vehicle Development
23. Vehicle Safety
24. Motorcycle and Commercial Vehicle Technology
25. Design of Traction Vehicles
26. Advanced Course: Rail Vehicles
27. Electric Railway Systems

of which three are to be elected and

28. Dynamics of Vehicle Drives
29. Simulation and Experimental Studies on Internal Combustion Engines
30. Functional Design in Automotive Vehicle Engineering
31. Traffic Safety in Connected, Automated Driving
32. Brake Systems and Brake Operation
33. Running Gears of Rail Vehicles
34. Rail Vehicle Design

of which three are to be elected.

D. In the field of study Lightweight Engineering, compulsory elective modules are

1. Measurement and Automation Engineering
2. Extended Fundamentals for Mechanical Engineering
3. Fundamentals of Lightweight Engineering
4. Lightweight Materials
5. Fibre-Reinforced Materials
6. Production Engineering - Manufacturing and Planning
7. Fundamentals of Automotive Vehicle Engineering
8. Fundamentals of Aerospace Vehicles
9. Fibre Composites Technology
10. Development of Lightweight Structures
11. Vibration Technology and Structural Durability
12. Continuum Mechanics and Structural Analysis
13. Construction Materials and Surface Engineering
14. Function-Integrated Structures
15. Dimensioning of Lightweight Structures
16. Fundamentals of Polymer Technology
17. Additive Manufacturing
18. Mechanism Synthesis and Multi-Body Simulation

of which modules amounting to 60 credit points are to be selected, as well as

19. Dimensioning and Design with Composites
20. Manufacturing of Composite Structures
21. Adaptive Structures for Lightweight Structures
22. Quality Assurance Management
23. Damage and Fatigue of Composites
24. Designing with Polymers

of which three are to be elected and

25. Dimensioning of Lightweight Structures
26. Design of Lightweight Structures
27. Plastics Technologies
28. Vibration Technology and Structural Durability
29. Continuum Mechanics and Structural Analysis
30. Construction Materials and Surface Engineering
31. Function-Integrated Structures
32. Special Problems of Lightweight Engineering
33. Lightweight Structures and Technologies for Selected Industries

of which three are to be elected if they have not already been elected.

E. In the field of study Aerospace Engineering, elective modules are

1. Industry-specific Lightweight Structures and Technologies
2. Extended Fundamentals for Mechanical Engineering
3. Fundamentals of Aerodynamics and Flight Mechanics
4. Fundamentals of Aerospace Vehicles
5. Fundamentals of Aerospace Engineering
6. Fundamentals of Construction and Dynamic Dimensioning of Machines
7. Fluid Power and Electrical Drive Systems
8. Process thermodynamics
9. Fundamentals of Heat and Mass Transfer
10. Fundamentals of Lightweight Engineering
11. Production Engineering - Manufacturing Processes
12. Aircraft Design

13. Space Technology
14. Turbomachines for Flight Propulsion
15. Vibration Technology and Structural Durability
16. Virtual Methods and Tools
17. Fundamentals of Flight Propulsion
18. Numerical Methods of Fluid Mechanics and Structural Mechanics
19. Additive Manufacturing
20. Tools and Methods of Product Development
21. Industrial Engineering

of which modules amounting to 60 credit points are to be selected, as well as

22. Aeroelastics
23. Communication Navigation Surveillance (CNS)
24. Probabilistics and Robust Design
25. Simulation Technology in Fluid Mechanics
26. Aircraft Maintenance
27. Aircraft Systems
28. Space and Science
29. Energy Supply in Space
30. Design of Jet Engines
31. Turbocompressors
32. Fundamentals of Flight Operations within the Modern Cockpit

of which three are to be elected and

33. Design of Innovative Aerospace Structures
34. Multifunctional Structures and Components
35. Fracture Criteria and Fracture Mechanics
36. Interdisciplinary Design Project Aerospace Engineering
37. Aircraft Structures
38. Aerodynamics of Aircraft
39. Aircraft Manufacturing
40. Flight Dynamics and Control
41. Space Mission Design
42. Space Propulsion
43. Space Environment
44. Technology of Flight Propulsion
45. Thermofluidynamics
46. Turbulent Flows and their Modelling

of which three are to be elected.

F. In the field of study Production Engineering, elective modules are

1. Measurement and Automation Engineering
2. Extended Fundamentals for Mechanical Engineering
3. Production Engineering - Manufacturing Processes
4. Production Engineering - Manufacturing and Planning
5. Production Engineering - Machine Tools and Production Automatization
6. Fundamentals of Lightweight Engineering
7. Lightweight Materials
8. Fibre-Reinforced Materials
9. Fundamentals of Construction and Dynamic Dimensioning of Machines
10. Fluid Power and Electrical Drive Systems
11. Mechanical Drives
12. Production Planning - Advanced Course
13. Laser and Plasma Technology



14. Production Measurement Technology
15. Production System and Intralogistics
16. Surface Engineering
17. Photonic Measurement Technology
18. Joinability
19. Production Automatization - Advanced Course
20. Methods to Simulate and Design Part Made by Prototyping, Blanking, and Forming Technology
21. Manufacturing Management
22. Material Flow Systems
23. Work Design
24. Conceptual Design of Machine Tools
25. Control of Production Machines and Plants
26. Manufacturing Processes - Advanced Course
27. Additive Manufacturing
28. Development of Machine Tools
29. Industrial Engineering
30. Tools and Methods of Product Development

of which modules amounting to 60 credit points are to be selected, as well as

31. Micro and Nanotechnologies
32. Laser Precision Machining
33. Weldability
34. Assembly and Robotics
35. Cutting and Erosion Manufacturing Engineering
36. Tools of Forming and Cutting/Splitting Technology
37. Factory Systems
38. Product Ergonomics and Product Safety
39. Property and Behavior Analysis of Machine Tools

of which three are to be elected and

40. Surface Engineering
41. Photonic Measurement Technology
42. Joinability
43. Production Automatization - Advanced Course
44. Methods to Simulate and Design Part Made by Prototyping, Blanking, and Forming Technology
45. Manufacturing Management
46. Material Flow Systems
47. Work Design
48. Conceptual Design of Machine Tools
49. Control of Production Machines and Plants

of which three are to be elected if they have not already been elected.

G. In the field of study Simulation Methods in Mechanical Engineering, compulsory elective modules are

1. Measurement and Automation Engineering
2. Extended Fundamentals for Mechanical Engineering
3. Numerical Methods and Structural Durability
4. Machine Dynamics and Constructive Development Process
5. Elastic Structures and Technical Fluid Mechanics
6. Process thermodynamics
7. Fundamentals of Heat and Mass Transfer
8. Fundamentals of Lightweight Engineering

9. Lightweight Materials
10. Fundamentals of Aerodynamics and Flight Mechanics
11. Fundamentals of Aerospace Vehicles
12. Gasdynamics
13. Experimental Fluid and Solid Mechanics
14. Bar and Surface Bearing Structures
15. Design with CAD-Systems/Product Modelling
16. Fundamentals of Power Machinery
17. Continuum Mechanics and Multifunctional Structures
18. Multi-Body Dynamics and Computational Fluid Dynamics
19. Dimensioning of Lightweight Structures (A)
20. Additive Manufacturing

of which modules amounting to 60 credit points are to be selected, as well as

21. Multiscale Material Modeling
22. Coupled Multifield Problems
23. System Dynamics and Structural Vibrations
24. Simulation Technology in Fluid Mechanics

two of which are to be elected if they have not already been elected, and

25. Multiscale Material Modeling
26. Coupled Multifield Problems
27. System Dynamics and Structural Vibrations
28. Simulation Technology in Fluid Mechanics
29. Rheology
30. Aeroelastics
31. Process and Structure Simulation
32. Analytical Methods of Solid Mechanics

one of which shall be elected, if it has not already been elected, and

33. Gasdynamics
34. Experimental Fluid and Solid Mechanics
35. Bar and Surface Bearing Structures
36. Virtual Methods and Tools
37. Fracture Criteria and Fracture Mechanics
38. Data Processing and Experimental Model Analysis
39. Dynamics of Mechanisms and Elastic Multi-Body Systems
40. Turbulent Flows and their Modelling
41. Theory of Materials
42. Numerical Modelling of Multiphase Flows

of which three are to be elected if they have not already been elected.

H. In the field of study Processing Machines and Textile Machines Engineering, elective modules are

1. Measurement and Automation Engineering
2. Extended Fundamentals for Mechanical Engineering
3. Drive Systems for Processing Machines and Textile Machines
4. Fluid Power and Electrical Drive Systems
5. Mechanical Drives
6. Lightweight Materials
7. Fibre-Reinforced Materials
8. Production Engineering - Manufacturing and Planning
9. Process Simulation for Processing Machines and Textile Machines
10. Machines and Technologies for Yarn Structures, especially Composites
11. Industrial Design Methodology

12. Simulation Methods in Drive Technology
13. Data Processing and Experimental Model Analysis
14. Machines and Technologies for 2D and 3D Textile Structures
15. Machines and Technologies for Textile Finishing and Ready-Made Technology
16. Mechanism Synthesis and Multi-Body Simulation
17. Control of Motion-Guided Machine Systems

of which modules amounting to 60 credit points are to be selected, as well as

18. Joining Technologies for Flexible Materials
19. Development of Complex Textile Constructions
20. Machines and Technologies for Technical Textiles
21. Machines and Technologies for the Manufacture of Nonwovens, Textile Recycling and Resource Efficiency
22. Packaging Technology
23. Food Machines and Pharmaceutical Machines
24. Systems Engineering

of which three are to be elected and

25. Processing Technology
26. Planning and Optimizing of Processing Lines
27. 3D CAE Technology for Fiber-Based Materials
28. Functionalisation and Interface Design
29. Fiber-Based Implants and Tissue Engineering

of which three are to be elected.