

These examination regulations have been worded carefully to be up to date; however, errors cannot be completely excluded. The official German text available at the Examinations Office is the version that is legally binding.

Note: Students who started their studies before the latest amendment came into effect are requested to comply with previous amendments and the respective transitory provisions.

**Degree Programme and Examination Regulations for the
Bachelor's degree programme in Physics and the
Master's degree programme in Physics as well as the Elite
degree programme 'Physics with Integrated Doctorate
Programme' at the Faculty of Sciences at
Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)
– BMPO/Physics –
Dated 7 September 2007**

amended by statutes of
29 September 2010
2 October 2013
17 October 2014
8 March 2016
17 August 2018

Based on Section 13 (1)(2), Section 43 (5)(2), Section 58 (1) and Section 61 (2)(1) of the Bavarian Higher Education Act (Bayerisches Hochschulgesetz, BayHSchG), FAU enacts the following examination regulations:

Table of contents:

I: General Provisions	3
Section 1 Scope, Purpose of the Bachelor's and Master's Examination.....	3
Section 2 Degrees	3
Section 3 Structure of the Bachelor's Degree Programme and Examinations, Standard Duration of Study, Start of Degree Programme, Teaching and Examination Language	3
Section 4 Structure of the Master's Degree Programme and Examinations, Specialisation, Standard Duration of Study, Start of Degree Programme, Teaching and Examination Language.....	4
Section 4a Elite Degree Programme 'Physics with Integrated Doctorate Programme'	4
Section 5 ECTS Credits.....	4
Section 6 Modules and Credits, Voluntary Interim Examinations	5
Section 7 Examination Deadlines, Failure to Observe Deadlines.....	5
Section 8 Examinations Committee	6
Section 9 Examiners, Observers, Exclusion Due to Personal Involvement, Obligation to Confidentiality	7
Section 10 Announcement of Examination Type, Examination Dates and Examiners, Registration, Withdrawal, Consequences of Delayed or Incorrect Withdrawal.....	8

Section 11 Admissions Committee for the Master's Degree Programme	8
Section 12 Accreditation of Skills.....	8
Section 13 Fraud, Breach of Regulations, Exclusion from Further Participation.....	9
Section 14 Revocation of Degrees	10
Section 15 Faults in the Examination Process.....	10
Section 16 Compulsory Attendance	10
Section 17 Written Examination, Multiple Choice Examinations.....	10
Section 18 Oral Examination	12
Section 18a Presentations.....	12
Section 18b Assessment of Practical Modules	12
Section 19 Electronic Examinations	13
Section 20 Evaluation of Examinations, Final Grade.....	13
Section 21 Invalidity of Examinations	14
Section 22 Inspection of Examination Records	14
Section 23 Final Academic Record, Transcript of Records, Diploma Supplement, Degree Certificate.....	15
Section 24 Notification of Failed Examinations.....	15
Section 25 Adjustments to Examination Arrangements.....	15
II: Special Provisions	16
Part I: Grundlagen- und Orientierungsprüfung (GOP) and Bachelor's Examination .	16
1. General Provisions for the Bachelor's Degree Programme	16
Section 26 Admission Requirements for Examinations	16
Section 27 Grundlagen- und Orientierungsprüfung (GOP).....	16
Section 28 Bachelor's Phase	16
Section 29 Bachelor's Thesis	17
Section 30 Resitting Examinations, Changing Modules	18
2. Examination Subjects in the Bachelor's Degree Programme	19
Section 31 Examination Subjects and Degree Programme Structure	19
Section 32 Grundlagen- und Orientierungsprüfung (GOP).....	20
Part II: Master's Examination	21
1. General Provisions for the Master's Degree Programme	21
Section 33 Qualification for a Master's Degree Programme	21
Section 34 Master's Examination.....	21
Section 34a Admission Requirements for Examinations	22
Section 35 Research phase and Master's Thesis.....	22
Section 36 Resitting Examinations, Changing Modules	23
2. Examination Subjects in the Master's Degree Programme.....	23
Section 37 Examination Subjects and Degree Programme Structure	23
Section 38 Purpose of Elite Degree Programme, Admission Requirements	24
Section 39 Examination Subjects in the Bachelor's Degree Programme.....	26
Section 40 Examination Subjects in the Master's Degree Programme.....	26
Section 41 Transfer to the Regular Bachelor's or Master's Degree Programme	26
III: Transitional and Final Provisions.....	27
Section 42 Legal Validity	27
IV: Appendices	28
Appendix 1: Qualification Assessment Process according to Section 33	28
Appendix 2: Structure of the Bachelor's Degree Programme in Physics (BSc)	30
Appendix 3: Structure of the Master's Degree Programme in Physics (MSc).....	33
Appendix 4: Specialisation in the Master's degree programme	35
Appendix 5: Structure of the Elite Degree Programme	36
Appendix 6: Glossary of English terms.....	39

Part I: General Provisions

Section 1 Scope, Purpose of the Bachelor's and Master's Examination

(1) These degree programme and examination regulations govern the examinations in the Bachelor's and Master's degree programmes in Physics as well as the Elite degree programme 'Physics with Integrated Doctorate Programme' at the Faculty of Sciences at FAU, leading to a Bachelor of Science or Master of Science degree respectively.

(2) ¹The Bachelor of Science is an undergraduate degree that qualifies students for professional work. ²The Bachelor's examination serves to determine whether students have acquired an overview of the fundamental knowledge of their subject and the necessary expertise for taking a subsequent Master's degree programme or making an early transition to professional practice.

(3) ¹The Master of Science is a postgraduate degree that prepares graduates for further research as well as professional work; the Master's degree programme is research-oriented. ²The Master's examination serves to determine whether the students are capable of working independently according to scientific methods and have acquired the necessary expertise for taking a subsequent doctoral degree programme or making the transition to professional practice.

Section 2 Degrees

(1) Passing the examinations results in the following degrees, depending on the type of degree programme:

1. The degree of Bachelor of Science (abbreviation: BSc) for passing the Bachelor's examination.
2. The degree of Master of Science (abbreviation: MSc) for passing the Master's examination.

(2) The degrees may also be used with the addition '(FAU Erlangen-Nürnberg)'.

Section 3 Structure of the Bachelor's Degree Programme and Examinations, Standard Duration of Study, Start of Degree Programme, Teaching and Examination Language

(1) ¹Students shall take a preliminary examination (Grundlagen- und Orientierungsprüfung, GOP) covering the foundations of the Bachelor's degree programme by the end of the second semester (orientation phase). ²The remainder of the Bachelor's degree programme (Bachelor's phase) shall comprise the compulsory examinations of the next four semesters, including the module Bachelor's thesis (and Bachelor's colloquium). ³A total of 180 ECTS credits shall be awarded for completing the Bachelor's examination.

(2) ¹The standard duration of the degree programme, which includes the examinations and work on the Bachelor's thesis, shall be six semesters. ²The specific content of the degree programme is stipulated in the module handbook under the descriptions of the modules for the degree programme.

(3) The Bachelor's degree programme may only be started in the winter semester.

(4) ¹The teaching and examination language of the Bachelor's degree programme in Physics is German. ²Individual teaching units and examinations in elective and key

qualification modules may be held in English; further details are stipulated in the module handbook. ³In any case of uncertainty, the examination language shall be the same as the teaching language.

Section 4 Structure of the Master's Degree Programme and Examinations, Specialisation, Standard Duration of Study, Start of Degree Programme, Teaching and Examination Language

(1) ¹The Master's degree programme builds on the contents of the Bachelor's programme; it is more research-orientated. ²The Master's degree programme consists of a specialisation phase lasting two semesters and following on from the Bachelor's programme, followed by a research phase lasting another two semesters. ³In the research phase, students carry out work on a research project that includes both further specialisation and the Master's thesis module, including the Master's colloquium. ⁴Students need to achieve a total of 120 ECTS credits to complete a Master's degree, including all required module examinations and the Master's thesis module, including the Master's colloquium.

(2) Students can choose a specialisation as part of their Master's degree programme according to the provisions stipulated in **Appendix 4**.

(3) ¹The standard duration of the Master's degree programme, which includes the examinations and work on the Master's thesis, shall be four semesters. ²Section 3 (2)(2) shall apply accordingly.

(4) The Master's degree programme may be started in the winter semester or in the summer semester.

(5) ¹The teaching and examination language of the Master's degree programme in Physics is English. ²Individual teaching units and examinations in the elective modules may be held in German; further details are stipulated in the module handbook. ³In any case of uncertainty, the examination language shall be the same as the teaching language.

Section 4a Elite Degree Programme 'Physics with Integrated Doctorate Programme'

(1) Together with Universität Regensburg, FAU offers especially talented, capable and dedicated students the option of completing the consecutive Bachelor's and Master's degree programme as an Elite doctorate programme pursuant to Sections 38 to 41 in conjunction with **Appendix 5**.

(2) Unless stipulated otherwise in Sections 38 to 41 or **Appendix 5**, the provisions for the Bachelor's degree programme in Physics and/or the provisions for the Master's degree programme in Physics shall apply accordingly for the Elite degree programme 'Physics with Integrated Doctorate Programme'.

Section 5 ECTS Credits

(1) ¹The degree programmes and examinations are organised on the basis of the European Credit Transfer and Accumulation System (ECTS). ²An average of 30 ECTS credits are awarded per semester. ³One ECTS credit corresponds to 30 hours of work.

(2) ¹ECTS credits serve as a system to categorise, calculate and confirm the amount of work a student has invested. ²They are a quantitative indicator of a student's workload.

Section 6 Modules and Credits, Voluntary Interim Examinations

(1) ¹The degree programme consists of modules for which students are awarded ECTS credits. ²One module is a chronologically connected and self-contained teaching and learning unit, the content of which can be tested in an examination.

(2) ¹The modules shall be completed with a module examination. ²This examination shall as a rule consist of one examination achievement or one course achievement. ³In exceptional cases, this examination can also consist of several parts or partial examinations or a combination of examination and/or course achievements if the subject warrants it. ⁴ECTS credits shall only be given for successful participation in modules that can be verified in an individual, separately identifiable performance in a module examination. ⁵Module examinations are conducted during the lecture period or following the last lecture/seminar of a module before the start of the next semester's lecture period.

(3) ¹Examinations (examination achievements and course achievements) measure the student's performance. ²They may be written, oral, electronic, or in a different form. ³Examination achievements and partial examinations are graded. ⁴Course achievements are graded pass or fail.

(4) ¹In addition to the module examinations, voluntary interim examinations (e.g. tutorial achievements or short tests) may be offered during courses as a way of measuring the standard of performance. ²More detailed information, including the number, type and scope of these examinations, is given in the module handbook. ³If a student chooses to use the option detailed in sentence 1, these results shall be taken into account when assessing the module and when determining the grade for the module in the case of modules which are graded. ⁴Interim examination achievements may improve the grade for a module examination or partial examination by a maximum of 0.7; a grade may not be made worse.

(5) ¹Enrolment in the relevant degree programme or in a degree programme at FAU which includes the modules in its curriculum is a requirement for participation in module examinations according to (2) sentence 1. ²This shall not apply to resit examinations within the meaning of Section 30 (1)(5).

Section 7 Examination Deadlines, Failure to Observe Deadlines

(1) ¹Examinations shall be sat in such a timely manner as to allow students to obtain 30 ECTS credits in the preliminary examination (GOP), 180 ECTS credits in the Bachelor's examination and 120 ECTS credits in the Master's examination by the scheduled deadlines. ²Deadlines shall be the second semester of the degree programme for the GOP and the last semester of the respective standard duration for the Bachelor's or Master's examination. ³The deadlines according to sentence 2 may be exceeded by the following periods (extended deadline):

1. GOP – by one semester
2. Bachelor's examination – by two semesters and
3. Master's examination – by two semesters.

⁴An examination shall be considered to have been sat and failed at the final attempt if the number of ECTS credits stipulated in sentence 1 was not obtained within the extended deadline according to sentence 3, unless the reasons for this are beyond the student's control.

(2) The deadline set forth in paragraph 1 shall be extended by claiming the periods of protection according to Sections 3, 4, 6 and 8 of the current version of the Maternity Protection Act (Mutterschutzgesetz – MuSchG) in the version published on 20 June 2002 (BGBl I S. 2318 [German Federal Law Gazette I p. 2318]), according to the periods set forth in the current version of the Parental Allowance and Parental Leave Act (Bundeselterngeld- und Elternzeitgesetz – BEEG) of 5 December 2006 (BGBl I S. 2748 [German Federal Law Gazette I p. 2748]), and according to periods of time spent providing care in the sense of Section 7 (3) of the current version of the Caregiver Leave Act (Pflegezeitgesetz - PflegeZG) of 28 May 2008 (BGBl I S. 874, 896 [German Federal Law Gazette I p. 874, 896]) for a close family member who requires care in the sense of the current version of SGB XI (German Social Security Code XI) of 26 May 1994 (BGBl I S. 1014, 1015 [German Federal Law Gazette I p. 1014, 1015]).

(3) ¹The reasons according to subsection (1)(4) and (2) shall be explained in writing and shown credibly to the Examinations Committee without delay. ²If the reasons are acknowledged, the examination shall be sat at the soonest possible time; already available examination and course achievements shall be accredited. ³In cases where the student is unable to sit an examination due to illness, the Examinations Committee may demand that the student submit a certificate from an official medical examiner (“vertrauensärztliches Attest”).

Section 8 Examinations Committee

(1) ¹An Examinations Committee shall organise and carry out the examinations for all degree programmes pursuant to these examination regulations. ²The Examinations Committee shall have five members that are professors at the Department of Physics at the Faculty of Sciences; they shall be elected by the Faculty Council. ³The Faculty Council shall elect one of the members as the chairperson and shall appoint a deputy to act in the event of the chairperson's absence. ⁴The term of office of the members shall be three years. ⁵Re-election shall be permitted.

(2) The chairperson may transfer tasks within their responsibility to a member of the Examinations Committee.

(3) ¹The Examinations Committee shall be tasked with carrying out the examination procedures, especially the planning and organisation of the examinations. ²Its duties include ensuring that the provisions of these examination regulations are observed. ³With the exception of the examinations themselves and their assessment, which the examiners are responsible for, all decisions shall be taken by the Examinations Committee unless they have been transferred to the Examinations Office. ⁴The Examinations Committee shall check delegated decisions if requested to do so and shall verify that examinations have been legitimately assessed. ⁵It shall regularly report to the Faculty Council on the development of the examinations and the study periods and shall, where applicable, provide input on amendments to the examination regulations. ⁶The members of the Examinations Committee shall have the right to be present during examinations.

(4) ¹The Examinations Committee shall have a quorum when all members are summoned in writing observing a notice period of at least one week and the majority of members is present and eligible to vote. ²Decisions shall be taken with the majority of votes cast in meetings. ³Abstentions, ballot votes and delegation of votes shall not be permitted. ⁴In case of a tie of votes, the vote of the chairperson shall be decisive.

(5) ¹The chairperson shall call the meetings of the Examinations Committee. ²The chairperson shall be entitled to take decisions that cannot be delayed on behalf of the Examinations Committee. ³The Examinations Committee shall be informed of such cases without delay. ⁴Furthermore, unless these examination regulations state otherwise, the Examinations Committee shall have the right to transfer individual tasks to the chairperson as well as revoke these responsibilities.

(6) ¹Official notifications in legal matters pertaining to examinations shall be made in writing; reasons shall be given and information on legal remedies available to the person shall be included. ²Students shall be given the opportunity to make a statement before negative decisions are finalised. ³The Examinations Committee shall have the right to rule that grade notifications may be sent out in electronic form to the individual students. ⁴The President shall issue any notification of objection in questions of examination legislation following consultation with the Examinations Committee and after hearing the examiners.

Section 9 Examiners, Observers, Exclusion Due to Personal Involvement, Obligation to Confidentiality

(1) ¹The Examinations Committee shall appoint examiners and reviewers. ²All persons eligible to administer examinations according to the current version of the Bavarian Higher Education Act (BayHSchG) and the Bavarian Higher Education Examiners Act (BayHSchPrüferV) shall be eligible for appointment. ³Sections 18a, 29 and 35 shall also apply to appointing examiners for seminar presentations, Bachelor's theses and Master's theses.

(2) ¹A change of examiners shortly before the start of an examination shall be permissible on urgent grounds. ²If an eligible examiner leaves the University, they shall usually remain eligible to act as an examiner for up to one year.

(3) ¹Persons who have completed the degree programme in question or a degree programme related to it shall be eligible for appointment as observers. ²Observers shall be full-time research associates.

(4) Exclusion from the deliberation and voting process of the Examinations Committee as well as from the positions of examiner and observer due to personal involvement shall be governed by Section 41 (2) BayHSchG.

(5) The obligation to confidentiality of the Examinations Committee and other persons involved in matters pertaining to examinations shall be governed by Section 18 (3) BayHSchG.

Section 10 Announcement of Examination Type, Examination Dates and Examiners, Registration, Withdrawal, Consequences of Delayed or Incorrect Withdrawal

(1) ¹The type and scope of the examinations are shown in the module plan in **Appendices 2, 3 and 5**. ²The dates of the examinations and the names of the examiners shall be announced in good time and according to local practice.

(2) ¹Students shall register for the individual module examinations after the start of the lecture period. ²The registration dates and formalities shall be announced by the Examinations Committee according to local practice four weeks in advance.

(3) ¹The deadlines set forth in Sections 7 and 30 notwithstanding, withdrawal from individual examinations shall be possible without adverse consequences. ²At the latest, students may withdraw from an examination up until the examination is scheduled to start by failing to attend. ³Students shall not be required to state reasons for such a withdrawal. ⁴After this point in time, withdrawal shall only be possible if reasons beyond the student's control according to Section 7 (1)(4) are given. ⁵Such reasons shall be provided in writing to the Examinations Committee without delay pursuant to (4). ⁶A declaration of withdrawal or withdrawal by failing to attend the examination pursuant to sentence 2 is irrevocable; by filing a declaration of withdrawal or failing to attend the examination as stipulated in sentence 2, the registration for the examination ceases to apply and the student is no longer entitled to attend. ⁷The consequences of a delayed or invalid withdrawal shall be governed by (4).

(4) ¹An examination achievement shall be graded as 'nicht ausreichend' (unsatisfactory; 5.0) if the student withdraws from the examination after the withdrawal period (cf. subsection 3) without good reasons. Section 7 (3) shall apply accordingly. ²In case of withdrawal from an examination due to illness after the examination has started, the student must submit a certificate from an official medical examiner to the Examinations Committee without delay.

Section 11 Admissions Committee for the Master's Degree Programme

(1) The evaluation of the qualification and admission requirements for the Master's degree programme shall be the responsibility of the Admissions Committee.

(2) ¹The Admissions Committee shall consist of six members of full-time research staff at the Department of Physics who are authorised examiners according to the Bavarian Higher Education Act (Bayerisches Hochschulgesetz) and the Higher Education Examiners Act (Hochschulprüferverordnung). ²At least four members including the chairperson shall be professors. ³The members shall be appointed by the Faculty Council of the Faculty of Engineering for a term of office of three years; re-election shall be permitted. ⁴The Faculty Council shall elect one of the members as the chairperson. ⁵Sections 8 (4) and (5)(1) shall apply accordingly.

Section 12 Accreditation of Skills

(1) ¹Study periods, modules, course and examination achievements achieved in degree programmes at FAU or other public or state-approved universities in the Federal Republic of Germany, through successful participation in a distance course as part of a degree programme at a public or state-approved university in the Federal Republic of Germany, or in degree programmes at foreign universities shall be accredited according to these examination regulations unless there are significant

differences in the skills acquired. ²The same shall apply to study periods, course and examination achievements achieved at a public or state-approved university in Bavaria in the course of other study programmes within the meaning of Section 56 (6)(1) and (2) BayHSchG, in special study programmes within the meaning of Section 47 (3)(1) BayHSchG, or at the Virtual University of Bavaria.

(2) ¹Skills acquired in programmes for professional development within the meaning of Section 56 (6)(3) BayHSchG, or outside of higher education shall be accredited if they are equivalent to skills acquired through university studies. ²Skills acquired outside the university sector shall replace no more than half of the required skills of which students must provide proof.

(3) ¹The grades achieved in approved modules, examinations and course achievements shall be transferred if they were awarded according to Section 20. ²If the grading system applied in the examinations sat at the university or equivalent institution of higher education and accredited by FAU is not identical to the grading system set forth in Section 20, the grades achieved at other universities shall usually be converted according to the following formula:

$$x=1+3(N_{\max} - N_d)/(N_{\max} - N_{\min}) \text{ with}$$

x = converted grade

N_{max} = best grade attainable

N_{min} = lowest grade for passing

N_d = grade attained.

³One decimal place shall count towards the module grade for grades thus calculated; further decimal places shall be omitted without being rounded. ⁴If conversion is not possible or can be proven to serve no purpose, the Examinations Committee shall determine a system by which to calculate the grades.

(4) ¹The documents needed for this accreditation shall be submitted to the chairperson of the Examinations Committee. ²Subject to the provisions in sentence 3, the student shall have a legal claim to accreditation if the conditions stipulated in (1) and (2) are met. ³Accreditation is only possible if the student has not already lost the right to be examined in that subject at FAU by passing or failing to pass the relevant examination at the final attempt. ⁴If a student requests accreditation, the decision shall rest with the chairperson of the Examinations Committee, if necessary after consultation with the representatives appointed by the department. ⁵The decision shall be issued in writing.

Section 13 Fraud, Breach of Regulations, Exclusion from Further Participation

(1) In case of an attempt to commit fraud or to influence the result of an examination through the use of unauthorised materials, the examination in question shall be graded as 'unsatisfactory' (5.0).

(2) Persons who disturb the orderly examination process may be excluded from continuing the examination by the authorised examiner or the supervising person; in this case the examination in question shall be graded as a fail or 'nicht ausreichend' (unsatisfactory; 5.0).

(3) In case of a repeated or severe breach of regulations in the sense of (1) or (2), the Examinations Committee may exclude students from further participation in the examination.

Section 14 Revocation of Degrees

The revocation of degrees shall be governed by Section 69 BayHSchG.

Section 15 Faults in the Examination Process

(1) Should it turn out that the examination process was faulty in a manner that influenced the result of the examination, it shall be ordered upon a student's request that a certain student or all students shall resit the examination or parts of the same.

(2) Faults in the examination process shall be reported to the chairperson of the Examinations Committee or the examiner without delay.

(3) Six months after completion of the examination, resit examinations may no longer be ordered ex officio as stipulated in (1).

Section 16 Compulsory Attendance

(1) ¹For teaching units, which are marked accordingly in the respective module description, in which the qualification goal can only be achieved by regular attendance, compulsory attendance can be made a requirement for admission to the module examination or for obtaining the course achievement. ²If attendance of the individual student is required for all participants to obtain the subject-specific skills, if the individual student obtaining such skills depends on the attendance of the other participants, or if subject-specific skills can only be obtained by being present at a particular place, or if participation is required for safety reasons, it is permissible to introduce an obligation to attend.

(2) ¹Regular attendance is defined as missing no more than 15 % of instruction time in any given teaching unit. ²If between 15 % and 30 % of instruction time has been missed, the lecturer can offer the student the option to obtain a substitute achievement fulfilling the requirement of regular attendance. If no such substitute achievements are offered or the substitute achievements offered are not obtained by the student, attendance is not considered to have been regular. ³If more than 30 % of all instruction time has been missed, the teaching unit must be taken again. ⁴Any positions after the decimal point in the percentage of instruction time missed shall be rounded for the benefit of the student.

(3) ¹Paragraph 2 notwithstanding, in the context of excursions and placements attendance is only considered to have been regular if all teaching units have been attended. ²Appropriate substitute achievements fulfilling the requirement of regular attendance shall be offered in the case of credibly shown periods of absence due to reasons beyond the student's control of up to and including 15 % of instruction time. ³If more than 15 % of instruction time has been missed, the teaching unit must be taken again. ⁴Any positions after the decimal point in the percentage of instruction time missed shall be rounded for the benefit of the student.

(4) Attendance is checked in the individual teaching units by means of an attendance list in which students must enter their name and signature.

Section 17 Written Examination, Multiple Choice Examinations

(1) ¹In written examinations (see **Appendices 2, 3 and 5**) for types and durations of written examinations students are required to prove that they are capable of identifying a problem and finding a solution to that problem within a fixed period and with set

materials, using the conventional methods employed in their field. ²If a student is unable to attend a written examination due to illness or spending a semester abroad and taking the examination at the next possible date would lead to a conflict with adhering to examination deadlines or completing the degree programme correctly which would not have arisen for the student previously, the Examinations Committee can, in exceptional circumstances and in consultation with the examiner, allow the examination to be taken as an oral examination provided this is not ruled out by the teaching concept of the module. ³In instances covered by sentence 2, the scope of the oral examination is determined by the Examinations Committee in consultation with the examiner.

(2) ¹Written examinations shall have a minimum duration of 60 and a maximum duration of 180 minutes. ²Details of the duration of each examination are given in **Appendices 2, 3 and 5**. ³Written examinations shall generally be assessed by an examiner within a period of four weeks and at least two weeks before the date of the first resit examination. ⁴If a written examination is graded as 'nicht ausreichend' (unsatisfactory; 5.0), it shall be presented to a second examiner for evaluation. ⁵The evaluation of each examiner must be documented in writing and reasons for the final grade must be made clear.

(3) ¹Written examinations may take the form of multiple-choice examinations (with one or more possible correct answers), either in full or in part. ²Detailed information on the modules with multiple choice examinations is given in the module handbook. ³The examinee shall state which of the answers to the questions they deem to be correct. ⁴Examination questions must allow for reliable examination results. ⁵When drawing up the examination questions, it shall be specified which of the answers shall be accepted as correct. ⁶If the question does not allow multiple answers, multiple answers shall be inadmissible and disregarded. ⁷Before the evaluation of the examination results, at least two of the authors of the examination shall assess whether the examination questions meet the requirement set out in sentence 4 and allow for reliable examination results. ⁸Should they determine that individual examination questions are faulty, these shall not be taken into account in the evaluation of the examination result; the number of examination questions shall be considered to have been reduced. ⁹This reduction of the number of examination questions may not result in disadvantages for any of the examinees. ¹⁰No minus points may be awarded outside of individual examination questions.

(4) ¹The examinations according to (3)(1) shall be considered to have been passed if:

1. The examinee answered at least 50 percent of the examination questions correctly/achieved at least 50 percent of the attainable points, or
2. The examinee answered at least 40 percent of the examination questions correctly/achieved at least 40 percent of the attainable points and the number of correct answers/points obtained is no more than 17 percent below the average number of correct answers/points obtained by all examinees sitting the examination for the first time.

²If sentence 1 no. 2 is applied, the Dean of Studies shall be notified.

(5) In case of written examinations that are not entirely composed of multiple choice questions, (3) and (4) shall only apply for the respective part.

Section 18 Oral Examination

(1) ¹In oral examinations students must demonstrate both general and specific knowledge of the subject being tested. ²Oral examinations shall be conducted, unless otherwise stated, in the presence of an observer appointed by the examiner. ³They are individual examinations and shall last between 15 and 45 minutes. ⁴Details of the duration of each examination are given in **Appendices 2, 3 and 5**. ⁵Section 17 (1) sentences 2 and 3 shall apply accordingly.

(2) In oral examinations in the presence of several authorised examiners, each examiner shall determine the grade according to Section 20 (1).

(3) ¹A record shall be kept of the oral examination; this shall include the following: place, date and duration of the examination; subjects covered and results of the examination; the names of the examiners, the observer and the student; and any special occurrences. ²The record shall be signed by the authorised examiners and the observer. ³It shall not be necessary to record the questions asked in the examination or the answers given. ⁴The record shall be kept in the examination records for a minimum of two years.

(4) ¹Students planning to undergo the same examination in a subsequent examination period shall be permitted to be present as listeners during oral examinations within the bounds of feasibility with regard to the examination's location; listeners shall be excluded at the examinee's request. ²Listeners shall on no account be permitted to attend the deliberation process and the announcement of the examination result.

Section 18a Presentations

(1) ¹In presentations, students should prove that they are capable of working independently on a scientific topic, presenting it clearly for a particular audience and defending their point of view in expert discussions. ²Presentations are assessed on the basis of content, verbal presentation, conduct during the discussion and, if applicable, performance during the preparation of the presentation. ³The supervisor for the presentation should as a rule be appointed as an examiner. ⁴If several authorised examiners pursuant to Section 9 (1)(2) attend a presentation, there shall be no need to include an observer.

(2) Section 18 (2) and (3) shall apply accordingly.

(3) Presentations may be declared as public in these examination regulations, its **appendices** or in the module catalogue; in this case listeners shall be permitted without the restriction stipulated in Section 18 (4).

Section 18b Assessment of Practical Modules

¹The type and scope of the examinations in the practical modules depend on the specific manner in which the respective module is taught; see module handbook for details. ²As a rule, the examination consists of conducting various experiments (ungraded) and documenting the experiments in a series of reports (graded). ³It is possible for the documentation of individual experiments to be submitted in advance for an interim assessment.

Section 19 Electronic Examinations

¹Examinations may be administered in electronic form. ²Detailed information on the modules in which examinations are in electronic form is given in the module handbook. ³Electronic examinations (e-examinations) are examinations which are administered and evaluated via computer or using digital technology. ⁴The authenticity and integrity of the examination results shall be verified. ⁵Automatically calculated evaluations of examination achievements shall be verified by one examiner at the request of the examinee or two examiners in case of a failed examination.

Section 20 Evaluation of Examinations, Final Grade

(1) The evaluation of individual examinations shall be expressed by the examiners with the following grades:

'sehr gut' (very good)	= (1.0 or 1.3)	an outstanding achievement;
'gut' (good)	= (1.7 or 2.0 or 2.3)	an achievement that exceeds the average requirements considerably;
'befriedigend' (satisfactory)	= (2.7 or 3.0 or 3.3)	an achievement that fulfils average requirements;
'ausreichend' (sufficient)	= (3.7 or 4.0)	an achievement that fulfils the requirements despite flaws;
'nicht ausreichend' (unsatisfactory)	= (4.3 or 4.7 or 5.0)	an achievement that no longer fulfils requirements due to considerable flaws.

(2) ¹An examination (Section 6 (2)) shall have been passed if it has received at least the grade 'ausreichend' (sufficient). ²For ungraded course achievements (Section 6 (3)(4)) the result shall be either 'bestanden' (pass) or 'nicht bestanden' (fail). ³Except when otherwise stipulated in sentence 8, a module examination shall have been passed when all partial achievements (Section 6 (2)(3)) have been passed. ⁴If an examination has several examiners or consists of several partial achievements within the meaning of Section 6 (2)(3), the total grade is calculated from the arithmetic average of the individual grades, weighted if applicable according to **Appendix 2, 3 or 5**; the grading system described in (1) shall not be used. ⁵Two decimal places shall count towards the grade; further decimal places shall be omitted without being rounded. ⁶If there is only one graded examination in a module, this grade shall be the grade for the module. ⁷If a graded examination is not held, the result for the module is either 'bestanden' (pass) or 'nicht bestanden' (fail). ⁸The **Appendices** may stipulate compensatory measures for failed partial examinations.

(3) ¹Multiple choice examinations shall be evaluated as follows: ²Students who answer the required minimum of examination questions correctly or attain the minimum number of attainable points according to Section 17 (4)(1) shall receive the grade:
1.0 ('sehr gut'/very good) if at least 75 percent of the remaining questions were answered correctly or remaining points were achieved,
2.0 ('gut'/good) if at least 50 percent but less than 75 percent of the remaining questions were answered correctly or remaining points were achieved,
3.0 ('befriedigend'/satisfactory) if at least 25 percent but less than 50 percent of the remaining questions were answered correctly or remaining points were achieved,
4.0 ('ausreichend'/sufficient) if zero or less than 25 percent of the remaining questions were answered correctly or remaining points were achieved.

³The grades can be increased or decreased by increments of 0.3 according to the percentage; the grades 0.7 and 4.3 shall not be awarded. ⁴Students who do not achieve the required minimum shall receive the grade 5.0. ⁵Sentence 3 notwithstanding, the grades 4.3 and 4.7 may be awarded in cases in which

examinations according to Section 17 (5) partly take the form of a multiple choice examination.

(4) ¹The preliminary examination (Grundlagen- und Orientierungsprüfung – GOP) shall have been passed if the required modules for the first two semesters stipulated in Section 32 have been passed. ²The preliminary examination (GOP) shall be ungraded.

(5) ¹The overall grade of the Bachelor's examination, the Master's examination and the modules shall be as follows:

at an average of up to 1.50 = 'sehr gut' (very good)

at an average of over 1.50 and up to 2.50 = 'gut' (good)

at an average of over 2.50 and up to 3.50 = 'befriedigend' (satisfactory)

at an average of over 3.50 and up to 4.00 = 'ausreichend' (sufficient).

²Students who achieve an overall Bachelor's or Master's grade up to and including 1.20 shall receive the assessment 'mit Auszeichnung' (with distinction).

(6) ¹All module grades of the degree programme shall be included in the calculation of the final grade of the Bachelor's or Master's examination, weighted according to their ECTS credits, unless stipulated otherwise in **Appendix 2, 3 or 5**. ²Paragraph (2)(5) shall apply accordingly.

(7) ¹If more modules were completed successfully than necessary for passing the Bachelor's or Master's examination, only those grades that are necessary to fulfil the conditions stipulated in Sections 31 and 37 shall be used to calculate the final grade. ²If more than one combination of modules is possible, the combination which produces the better final grade shall be applied. ³Other combinations can be credited upon the student's request.

Section 21 Invalidity of Examinations

(1) If fraudulent methods were used during the examination and if this only becomes known after the certificate has been awarded, the Examinations Committee may correct the grade retrospectively and declare the examination as having been failed in part or in full.

(2) If the requirements for admission to the examination were not fulfilled while no fraudulent acts were committed wilfully and if this fact only becomes known after the certificate has been awarded, these circumstances shall be considered remedied by the passing of the examination.

(3) Students shall be given the opportunity to make a statement before a decision is taken.

(4) ¹The incorrect certificate shall be withdrawn; a new certificate shall be issued if applicable. ²A decision according to (1) and (2) shall be excluded after a period of five years starting with the certificate's date of issue.

Section 22 Inspection of Examination Records

(1) After the completion of the individual examination procedures, students shall on request be entitled to inspect their written examination papers, the corresponding reviews by the examiners, and the examination records.

(2) ¹Students shall submit the request to the responsible examination body within one month of being notified of their grades. ²Unless the Examinations Office is responsible, the examiner shall allow the inspection; further details shall be decided by the Examinations Committee. ³Students prevented from observing the deadline according to (1) through no fault of their own shall be granted full restitution according to Section 32 of the Bavarian Administrative Procedures Act (BayVwVfG).

Section 23 Final Academic Record, Transcript of Records, Diploma Supplement, Degree Certificate

(1) Students who have successfully completed a degree programme pursuant to these examination regulations shall receive a final academic record, a transcript of records, a diploma supplement and a degree certificate, if possible within four weeks.

(2) ¹The final academic record shall contain the modules and module grades used in the calculation of the Bachelor's or Master's examination grade as well as the Bachelor's or Master's examination grade itself. ²The transcript of records lists all successfully completed modules; the final academic record and the transcript of records may be combined into one document. ³The transcript of records and the diploma supplement shall be issued in English and German. ⁴Information not yet available to the Examinations Office must be submitted together with the required proof by the time of the degree programme's completion at the latest; otherwise this information may no longer be taken into consideration for the documents listed in (1).

Section 24 Notification of Failed Examinations

Upon request and submission of the required certificates as well as the de-registration certificate, students who have failed the Bachelor's or Master's examination at the final attempt shall receive written confirmation showing that the examination was failed, which grades were achieved in the individual module examinations and which examination achievements are still missing.

Section 25 Adjustments to Examination Arrangements

(1) ¹The examination procedure shall be adjusted to take into account the nature and extent of a student's disability, if applicable. ²Students with a doctor's certificate showing credibly that they are either in part or fully incapable of sitting the examination in the intended manner due to long-term or permanent disabilities which do not affect the performance which is being tested shall be entitled to have the permission of the chairperson of the Examinations Committee to offset this disadvantage by a corresponding extension of their working time or by the examination process being structured differently. However, care must be taken to ensure that the examination is still suitable to provide evidence of skills which are being assessed by the examination.

(2) Adjustments to examination arrangements may be made for pregnant students if the student submits a medical certificate confirming that she will be at least 30 weeks pregnant by the examination date to the Examinations Committee responsible at least four weeks before the examination date.

(3) ¹Decisions according to (1) and (2) shall only be taken by the chairperson of the Examinations Committee upon written request. ²The student may be required to submit an official certificate from a medical examiner ('vertrauensärztliches Attest') proving the fulfilment of the conditions in (1). ³Applications for adjustments to examination

arrangements shall be made to the Examinations Committee at the latest four weeks before the examination, or at least before commencing the examination.

Part II: Special Provisions

I: Grundlagen- und Orientierungsprüfung (GOP) and Bachelor's Examination

1. General Provisions for the Bachelor's Degree Programme

Section 26 Admission Requirements for Examinations

(1) ¹Students enrolled in a Bachelor's degree programme shall be deemed as admitted to the Bachelor's examination and the module examinations of which the Bachelor's examination consists, unless admission is to be refused. ²If there are elective options for the modules to be completed for the Bachelor's examination, students shall be considered admitted to the modules they choose by registering for the examination; the choice shall be binding and students may also choose several modules offered as an alternative. ³Admission shall be refused if:

1. Requirements are not met or certificates are not submitted at all or not in due time as stipulated in the special provisions of these examination regulations and in **Appendix 2 or 5**.
2. The preliminary examination (GOP) has been failed at the final attempt.
3. The Bachelor's examination, the Diplom intermediary examination or the Diplom examination in Physics have been failed at the final attempt.
4. It has been ordered that the student is to be de-registered, resulting in the revocation of the student's right to sit the examination.

(2) If admission to the degree programme's examinations is to be refused, the decision shall be taken without delay, furnished with reasons and information on legal remedies available and announced to the student.

(3) Unless stipulated otherwise in Section 32 and notwithstanding the recommendations in **Appendix 2 or 5**, students may choose in which order they complete the modules.

Section 27 Grundlagen- und Orientierungsprüfung (GOP)

(1) In the preliminary examination (GOP), students should prove that they:

- can fulfil the academic requirements of the Bachelor's degree programme in Physics and
- have acquired the methodological skills required to continue their studies successfully.

(2) The preliminary examination (GOP) shall be evaluated according to Section 32.

Section 28 Bachelor's Phase

(1) ¹The Bachelor's phase shall serve as a phase for expansion and specialisation, conveying expertise that goes beyond the knowledge acquired in the orientation phase and that is necessary for early career entry. ²It consists of the module examinations of the Bachelor's phase, the Bachelor's examination and the Bachelor's colloquium. ³The Bachelor's examination shall have been passed if all required module examinations pursuant to Section 31 in conjunction with **Appendix 2** or Sections 31 and 39 in

conjunction with **Appendix 5** and the Bachelor's thesis module (Section 29), including the Bachelor's colloquium, have been passed.

(2) ¹The fifth semester of the degree programme can be used for a semester abroad.
²Achievements obtained abroad shall be accredited according to Section 12.

Section 29 Bachelor's Thesis

(1) ¹The Bachelor's thesis is intended to show that the student is capable of dealing with a problem from the field of physics independently, with scientific methods and within a set period, and of presenting the results in an appropriate form. ²A total of 15 ECTS credits are awarded for the Bachelor's thesis module, with 12 ECTS credits being allocated to the Bachelor's thesis and 3 ECTS credits to the colloquium. ³The Bachelor's colloquium consists of a presentation on the Bachelor's thesis that lasts approximately 30 minutes and is generally public, followed by a discussion.

(2) ¹Full-time lecturers for the Physics degree programme (supervisors) shall be entitled to assign Bachelor's theses. ²The Examinations Committee shall have the right to grant exceptions.

(3) ¹Students shall ensure that they are allocated a subject for their Bachelor's thesis in time to observe the deadlines set forth in Section 7, usually at the start of the lecture period of the sixth semester at the latest. ²The subject and the date of its allocation shall be confirmed by the supervisor and presented to the Examinations Committee. ³Should a student, despite a genuine effort to that end, not be allocated a subject, the chairperson of the Examinations Committee shall allocate a subject and a supervisor to the student upon request.

(4) ¹The period between the allocation of the subject and submission of the thesis shall not exceed three months (standard thesis work period); it may only be extended by a maximum of one month in justified exceptional circumstances. ²The scope of the subject shall be such that the workload for the Bachelor's thesis and the preparation of the Bachelor's colloquium does not exceed a total of 450 hours and students are able to complete the Bachelor's thesis within the standard thesis work period. ³If a student submits a doctor's certificate proving that they are incapable of working on the thesis, the period set for working on the thesis will be suspended temporarily. ⁴Upon the student's written request and with the supervisor's agreement, the chairperson of the Examinations Committee may interrupt the period for thesis work if other valid reasons beyond the student's control arise and are supported with relevant documents.

(5) ¹The subject of the Bachelor's thesis may only be returned once, provided the chairperson of the Examinations Committee grants approval and the subject is returned within the first two weeks of the period for thesis work. ²Otherwise the Bachelor's thesis shall be graded 'nicht ausreichend' (unsatisfactory; 5.0) if the subject is returned; it shall be regarded as rejected.

(6) ¹The thesis may be written in English on the student's request and with the supervisor's approval. ²The chairperson of the Examinations Committee shall decide whether to grant the student's request.

(7) ¹One bound copy and one electronic copy each shall be submitted to the supervisor and the library of the Department of Physics (Gruppenbibliothek Physik); confirmation

that the thesis has been received and a copy of the title page shall be submitted to the Examinations Office. ²The thesis shall include a declaration by the student confirming that the thesis is an original work, that no other sources or materials than the ones listed were used and that the thesis is not to any significant degree identical to one which has already been submitted to a different examination authority (prevention of plagiarism).

(8) ¹The thesis shall be evaluated by two examiners within four weeks of submission. ²The person who allocated the subject shall generally be the first reviewer.

(9) ¹The thesis shall be accepted if it receives at least the grade 'ausreichend' (sufficient) from both reviewers. ²It shall be rejected if it receives the grade 'nicht ausreichend' (unsatisfactory) from both reviewers. ³If one reviewer grades the thesis as 'nicht ausreichend' (unsatisfactory) and the other reviewer grades it at least as 'ausreichend' (sufficient), the Examinations Committee shall arrange for a third review and grading to be carried out by an examiner according to Section 9. ⁴If the third grade is also 'nicht ausreichend' (unsatisfactory), this shall be the grade the thesis receives; otherwise the grade shall be calculated as the arithmetic average of the two grades that are at least 'ausreichend' (sufficient). ⁵Section 20 (2)(5) shall apply accordingly.

(10) ¹If the thesis is rejected or if it is considered to have been rejected, it may be repeated once; a second repetition or revision shall not be permitted. ²The student shall ensure that they receive a new subject for the repetition of the thesis within two months following the announcement of the rejection; otherwise the thesis shall be regarded as having been failed at the final attempt. ³Paragraphs 1 and 2, paragraph 3 sentences 2 and 3 and paragraphs 4 to 9 shall apply accordingly in the case of a repetition.

(11) Provisions that deviate from paragraphs 1 to 10 may be agreed upon within the framework of dual degree agreements or degree programme co-operations.

Section 30 Resitting Examinations, Changing Modules

(1) ¹With the exception of the module examinations of the preliminary examination (GOP) and the Bachelor's thesis module, every failed module examination may be resat twice. ²The resit examination shall be limited to the failed examination or course achievement. ³The module examinations of the preliminary examination (GOP) may only be resat once. ⁴Section 29 (10) shall apply to the repetition of the Bachelor's thesis module. ⁵Resit examinations shall take place at the earliest possible date; the Department must offer such a date within six months. ⁶The resit period shall not be interrupted by de-registration or leave. ⁷Students who have failed an examination shall be considered to have registered for the next resit examination. ⁸If a student misses the resit examination or the resit period is not observed, the examination shall be deemed to have been failed unless the Examinations Committee grants the student a respite due to special reasons beyond the student's control; Section 7 (3) shall apply accordingly. ⁹The provisions regarding maternity protection, parental leave and caregiver leave (Section 7(2)) shall apply.

(2) ¹Voluntarily resitting a passed examination of the same module shall not be permitted. ²Alternative modules may be attended and completed instead of failed modules within the examination periods set forth in Section 7. ³Failed attempts in an

alternative module taken previously or in parallel to the module in question shall not be counted.

2. Examination Subjects in the Bachelor's Degree Programme

Section 31 Examination Subjects and Degree Programme Structure

(1) ¹Students shall successfully complete modules from the Bachelor's degree programme worth a total of 180 ECTS credits to pass the Bachelor's examination. ²The degree programme comprises compulsory modules (142.5 ECTS credits), elective modules (25 ECTS credits), key qualifications (2.5 ECTS credits) and free electives (10 ECTS credits), as set forth in **Appendix 2** and **5** and the provisions stipulated below. ³Due to the specific subject skills that must be acquired as part of the qualification goals of the Bachelor's degree programme as defined in the module description, modules may not be taken twice and accredited to different areas of the degree programme.

(2) ¹Students shall successfully complete **compulsory modules** in the Bachelor's degree programme worth a minimum of 142.5 ECTS credits to pass the Bachelor's examination. ²These modules are:

- (a) *Experimental physics 1+2* and *Experimental physics 3+4*;
- b) At least one of either *Experimental physics 5* or *6*;
- c) *Introductory laboratory course 1* and *2*;
- d) Laboratory courses *Physics experiments 1* and *2*;
- e) *Theoretical physics 1* (Mechanics);
- f) At least two of *Theoretical physics 2–4* (Electrodynamics, Quantum mechanics, Statistical physics);
- g) Colloquium in Theoretical physics;
- h) *Mathematics for physics students 1*;
- i) At least one of the two modules *Mathematics for physics students 2* and *3*;
- j) *Data processing in Physics*;
- k) *Bachelor's thesis (including Bachelor's colloquium)*.

(3) ¹The **elective subjects** are divided into **elective physics subjects** and **elective non-physics subjects**. ²Students shall successfully complete modules from the elective subjects worth at least 25 ECTS credits. ³The elective modules allow students to specialise in certain areas of physics or related interdisciplinary subjects, which gives them the opportunity to establish a profile suited to certain areas of work or specialist study in the consecutive Master's degree programme in Physics.

(4) ¹In the **elective physics subjects**, students acquire specialised and interdisciplinary knowledge on topics of their choosing from the field of physics. ²Students shall successfully complete modules worth at least 10 ECTS credits, among them the *Physics seminar* module. ³The seminar promotes both subject-specific and personal and social skills. For the seminar, students are expected to prepare a specific topic for an expert audience, present it in a manner suited to the target group and practice leading an academic discussion. The presentation shall be pitched at a level suitable for a Bachelor's degree programme. ⁴As a rule, the elective physics modules consist of a lecture and a tutorial (2 semester hours each) or a seminar (2 semester hours). ⁵As a rule, students are awarded 5 ECTS credits for each module. ⁶Examination achievements are either a 90 minute written examination, a 30 minute oral examination

or a 45 minute presentation. ⁷Deviations in the number of ECTS credits awarded, duration of examinations or types of examinations shall be allowed in exceptional cases if justified on the basis of teaching methods or the subject in question. ⁸The scope and ECTS credits of individual modules may deviate from the information given in **Appendix 2** or **5**. ⁹Details of any deviation shall be stipulated in the respective module handbook. ¹⁰The module handbook shall list the modules that count as elective physics modules and stipulate the details of examinations.

(5) ¹In the **non-physics elective subjects**, students shall learn subject-related methods of research and explore their subject in more depth. ²Students shall successfully complete modules worth at least 10 ECTS credits. ³In the orientation phase of the Bachelor's degree programme, students obtain fundamental knowledge in a subject related to physics (*Non-physics elective subject 1*). ⁴Currently Astronomy, Chemistry, Computer Science, Physical Chemistry and Materials Science are permitted. ⁵The catalogue of modules that may be chosen may be expanded; see the module handbook for more information. ⁶In the Bachelor's phase, students may acquire specialised knowledge of the same or fundamental knowledge of another elective non-physics subject as long as these subjects are related to the subject of physics. ⁷This shall apply in particular to all subjects at the Faculty of Sciences, the Faculty of Engineering and non-clinical subjects at the Faculty of Medicine; other cases shall be decided by the Examinations Committee if so requested by the student. ⁸The type and scope of teaching units and examinations depend on the specific manner in which the respective module is taught and are regulated by the applicable **degree programme and examination regulations** and/or the module handbook.

(6) ¹**Interdisciplinary skills** are taught in the key qualifications area. ²In addition to the non-physics elective subjects, modules worth at least 2.5 ECTS credits shall be completed from the range of subjects available at the University that are not part of the Physics degree programme. ³The Examinations Committee may accept modules which are not offered by the University as key qualification if a request is submitted in writing and states reasons. ⁴Modules from the key qualifications area shall be ungraded. (5)(8) shall apply accordingly.

(7) The minimum of 170 ECTS credits required according to (2) to (6) shall be made up to the 180 ECTS credits necessary for completion of the Bachelor's degree through additional, freely chosen modules (**free electives**) from the compulsory and elective subjects or from the key qualifications area.

(8) ¹If there is the option to choose which modules are to be completed in the individual areas of the Bachelor's degree programme, the modules on offer may be taken in parallel. ²If individual examinations are failed, the failed attempts shall not be counted towards examination attempts allocated for the other modules. ³This shall also apply in the event that individual modules have been failed at the final attempt or are considered to have been failed at the final attempt. ⁴The area in question or the Bachelor's degree programme as a whole shall only be considered to have been failed at the final attempt within the meaning of Section 7 once the number of ECTS credits for the respective area can no longer be obtained by passing alternative modules.

Section 32 Grundlagen- und Orientierungsprüfung (GOP)

In order to successfully pass the preliminary examination (GOP), students must obtain a minimum of 30 ECTS credits from the modules listed for the first two subject

semesters in **Appendix 2 or 5** by the end of the second semester. The following modules have to be completed successfully:

- a) *Basic laboratory 1*
- b) at least one of *Theoretical physics*, *Mathematics for physics students 1* and *Mathematics for physics students 2*.

II: Master's Examination

1. General Provisions for the Master's Degree Programme

Section 33 Qualification for a Master's Degree Programme

(1) ¹In order to qualify for the Master's degree programme, students must have completed a relevant degree programme with an above-average grade. ²Certificates for the following shall be submitted as proof of qualification:

1. A Bachelor's degree according to these examination regulations or
2. a German or non-German university degree that is equivalent to the qualification specified in point 1
and
3. a pass in the qualification assessment process according to **Appendix 1**.

(2) ¹Applicants shall belong to the best 50 percent of their class or shall have completed the degree programme in question with a final grade of at least 2.5 ('gut'; good).

²Degrees that were graded according to a different grading system are to have received at least a rating equivalent to the grade 'gut' (good).

(3) ¹Bachelor's degrees in Physics and Materials physics shall generally be considered equivalent. ²If there are significant differences which can be compensated for, the Admissions Committee may grant admission under the condition that proof of further achievements worth up to a maximum of 20 ECTS credits and to be determined by the Admissions Committee be submitted within one year of being admitted to the Master's degree programme.

(4) Section 26 shall apply accordingly.

Section 34 Master's Examination

(1) ¹The Master's examination shall consist of the required module examinations and the modules from the research phase, in particular the Master's thesis module including the Master's colloquium. ²The Master's colloquium is an oral examination that consists of a presentation on the Master's thesis that lasts approximately 45 minutes and that is usually public, followed by a discussion. The examination also focuses on how the thesis relates to a wider physics context. ³The Master's examination shall have been passed if all required module examinations and the modules of the research phase have been passed.

(2) ¹**Appendix 3** in conjunction with Section 37 shall specify the subjects, type and scope of the Master's examination. ²The provisions in **Appendix 4** shall additionally apply to students completing the Master's examination with a specialisation. ³Sentences 1 and 2 notwithstanding, the subjects, type and scope of the Master's examination in the Elite degree programme are stipulated in Appendix 5 in conjunction with Section 37 and Section 40; Specialisation is not possible in this instance. ⁴Modules which have already been the subject of a Bachelor's examination cannot be accredited

as part of the Master's examination due to the specific subject skills that must be acquired as part of the qualification goals of the Master's degree programme. ⁵The Examinations Committee may grant exceptions.

Section 34a Admission Requirements for Examinations

¹Students enrolled in the Master's degree programme shall be considered admitted to the Master's examination and the module examinations of which the Master's examination consists, unless admission is to be refused. ²If there are elective options for the modules to be completed for the Master's examination, students shall be considered admitted to the modules they choose by registering for the examination; the choice shall be binding and students may also choose several modules offered as an alternative. ³Admission shall be refused if:

1. Requirements are not met or certificates are not submitted at all or not in due time as stipulated in the special provisions of these examination regulations and in **Appendix 3 or 5**.
2. The Master's examination or the Diplom examination has been failed at the final attempt in this degree programme or a related degree programme within the meaning of Section 33 (1) and (3)(3).
3. It has been ordered that the student is to be de-registered, resulting in the revocation of the student's right to sit the examination.

⁴ Section 26 (2) and (3) shall apply accordingly.

Section 35 Research Phase and Master's Thesis

(1) ¹The Master's thesis is a graded written assignment that concludes the Master's degree. ²It is intended to show that the student is capable of dealing with a problem from the field of physics independently, with scientific methods and within a set period. ³The Master's thesis may not, to any significant extent, be identical to a previously submitted Diplom, Bachelor's or Master's thesis (prevention of plagiarism). ⁴A total of 30 ECTS credits are awarded for the Master's thesis, with 25 ECTS credits allocated to the Master's thesis and 5 ECTS credits to the Master's colloquium. ⁵The work on the Master's thesis is preceded by three months of subject specialisation and three months of project planning that prepare the student on the subject of the Master's thesis. ⁶Subject specialisation, project planning, Master's thesis and Master's colloquium together make up the year-long research phase.

(2) ¹Students shall ensure that they are allocated a project for the research phase in time to observe the deadlines set forth in Section 7. ²Should a student, despite a genuine effort to that end, not be allocated a subject, the chairperson of the Examinations Committee shall allocate a project and a supervisor to the student upon request.

(3) ¹The research phase shall be supervised by a lecturer who works full-time in the Master's degree programme in Physics at FAU. ²The Examinations Committee shall have the right to grant exceptions.

(4) ¹After successfully completing the subject specialisation and project planning stages, students shall be allocated a subject for their Master's thesis. ²The subject of the Master's thesis and the date it was allocated to the student shall be confirmed by the supervisor and included in the student's records held by the Examinations Committee. ³The time between the selection of a subject and the submission of the Master's thesis shall not exceed six months; the scope of the subject must be such

that the thesis can be completed within this period. ⁴The period for the thesis may be extended by way of exception by a maximum of three months upon justified request. ⁵Section 29 (4) sentences 3 and 4 shall apply accordingly.

(5) ¹The subject may only be returned once and with good reason and with the approval of the chairperson of the Examinations Committee. ²Otherwise the Master's thesis shall be graded 'nicht ausreichend' (unsatisfactory; 5.0) if the subject is returned; it shall be regarded as rejected.

(6) ¹The Master's thesis shall usually be written in English. In exceptional cases, it can be written in German on the student's request and with the supervisor's approval. ²The chairperson of the Examinations Committee shall decide whether to grant the student's request. ³The Master's thesis shall contain a summary of findings at the end. ⁴The design of the title page shall follow the template provided by the Examinations Committee. ⁵The Master's thesis shall include a declaration from the student confirming that the thesis is an original work and that no other sources or materials than the ones listed were used. ⁶One bound copy and one electronic, machine-readable copy each shall be submitted to the supervisor and the library of the Department of Physics ('Gruppenbibliothek Physik'); confirmation that the thesis has been submitted, stating the date of submission, and a copy of the title page shall be submitted to the Examinations Office. ⁷If the Master's thesis is not submitted in time, it shall be graded 'nicht ausreichend' (unsatisfactory; 5.0); it shall be regarded as rejected.

(7) Section 29 (8) to (11) shall apply accordingly.

Section 36 Resitting Examinations, Changing Modules

Section 30 shall apply to resitting examinations and changing modules.

2. Examination Subjects in the Master's Degree Programme

Section 37 Examination Subjects and Degree Programme Structure

(1) ¹Students shall successfully complete modules worth a minimum of 120 ECTS credits to pass the Master's examination. ²The degree programme comprises compulsory modules (90 ECTS credits), elective modules (20 ECTS credits) and free electives (10 ECTS credits) pursuant to **Appendix 3** or **5** as well as the following provisions. ³During the first two semesters ('specialisation phase') of the Master's degree programme, students shall acquire specialised knowledge in chosen areas of physics. ⁴In semesters 3 and 4 ('research phase'), students work independently on a research project. The results of the project are explored in the Master's thesis and presented, discussed and placed in a wider physics-related context during the Master's colloquium. ⁵The modules *Specialisation phase* and *Project planning and preparation* are intended to prepare students for the Master's thesis; their content reflects this.

(2) ¹Students shall successfully complete **compulsory modules** in the Master's degree programme worth a minimum of 90 ECTS credits to pass the Master's examination.

²These modules are:

- (a) at least one of the *Advanced experimental physics modules*,
- (b) at least one of the *Advanced theoretical physics modules*,

- (c) the modules *Advanced lab courses and projects 1 and 2*,
- (d) the module *Specialisation phase*,
- (e) the module *Project planning and preparation*,
- (f) the module *Master's thesis including Master's colloquium*.

³The following can be chosen as *Advanced experimental physics* modules

- Lasers, atomic physics and quantum optics (EV-A),
- Particle and astroparticle physics (EV-B),
- Solid state physics (EV-C).

⁴The following can be chosen as *Advanced theoretical physics* modules

- Advanced quantum mechanics (TV-A),
- Advanced solid state physics (TV-B).

⁵The Examinations Committee may approve further options.

(3) ¹The **elective subjects** are divided into **elective physics subjects** and **elective non-physics subjects**. ²Students shall successfully complete elective modules worth at least 20 ECTS credits.

(4) ¹In the **elective physics subjects**, students acquire specialised and interdisciplinary knowledge in physics-related subjects of their choice; they shall successfully complete modules worth a minimum of 10 ECTS credits, among them one physics seminar (*Physikalisches Seminar*). ²Section 31 (4) sentences 3 to 6 shall apply accordingly. ³The scope and ECTS credits of individual modules may deviate from the information given in **Appendix 3** or **5**. ⁴The module handbook lists the modules that count as elective physics modules.

(5) ¹In the **elective non-physics subjects**, students may acquire specialised knowledge in a physics-related subject of which they already have fundamental knowledge or fundamental knowledge in another subject. ²Section 31 (5) sentences 7 and 8 shall apply accordingly.

(6) ¹The minimum of 110 ECTS credits required according to (2) and (3) shall be made up to the 120 ECTS credits necessary for completion of the Master's degree through additional, freely chosen modules (**free electives**) from the compulsory and elective subjects .

(7) Section 31 (8) shall apply accordingly.

III: Elite Degree Programme 'Physics with Integrated Doctorate Programme'

Section 38 Purpose of Elite Degree Programme, Admission Requirements

(1) ¹Within the context of the Bachelor's and Master's degree programmes in Physics, together with Universität Regensburg, FAU offers special teaching units as part of the Elite degree programme 'Physics with Integrated Doctorate Programme'. ²The Elite degree programme lays a particular focus on research and aims to enable particularly gifted, talented and dedicated students the opportunity to obtain their doctoral degree within a period of approximately six years. ³This process usually begins after the second semester; the option of specialising as stipulated in Section 34 (2)(2) and **Appendix 4** does not apply. ⁴Students can attend teaching units which are part of the Master's degree programme after completing the fourth semester in the Bachelor's degree programme. ⁵After being accepted into the Master's degree programme,

achievements obtained within the context of the Bachelor's degree programme shall be counted towards the required achievements for the Master's degree programme.

(2) ¹In order to be admitted to the Elite degree programme, students must fulfil certain requirements, which are checked by a selection committee (5). ²Students shall fulfil the following requirements:

1. Students shall not have progressed further than the fourth semester at the time they enter the programme.
2. The applicant shall submit proof of outstanding achievements in the Bachelor's degree programme in Physics at FAU or at another university; the applicant shall in particular be deemed to have obtained outstanding achievements if their average grade is 'sehr gut' (1.5 or better) or if the applicant is among the top 10 percent of their year. Section 12 (3) sentences 1 to 3 shall apply accordingly.
3. Students at FAU shall have completed the modules in **Appendix 5** within the first two subject semesters; students from other universities shall submit proof of equivalent achievements.

³If the applicant is accepted into the Elite degree programme, the achievements obtained to date shall be accredited accordingly.

(3) ¹Applications for admission to the Elite degree programme shall be submitted by 15 August for the following winter semester and by 15 February for the coming summer semester (deadlines). ²The following documents shall be submitted with the application: a CV, full details of studies so far, and documents proving the applicant's outstanding achievements so far (e.g. transcript of records).

(4) ¹The selection committee which is responsible for assessing whether applicants for the Elite degree programme meet requirements shall consist of three professors from the Department of Physics at FAU. ²The members shall be appointed by the Faculty Council of the Faculty of Sciences for a term of office of three years. ³They may be reappointed. ⁴The members of the committee shall elect one of the members as the chairperson and shall appoint a deputy to act in the event of the chairperson's absence.

(5) ¹The selection committee shall carry out a preselection of applicants based on the submitted application documents. ²A selection panel shall be formed to conduct two selection interviews with each of the selected candidates. ³The selection panel shall consist of two professors from the Department of Physics, appointed by the selection committee.

(6) ¹After assessing the submitted documents and both selection interviews, the selection panel shall unanimously decide whether the candidate is 'suitable' or 'not suitable'. ²If a unanimous decision cannot be taken, the selection panel shall submit a report to the selection committee, which shall then take a majority decision on whether the candidate is 'suitable' or 'not suitable'. ³If a candidate is deemed 'not suitable', they may not submit another application for admission to the Elite degree programme on the basis of the documents submitted for the first application.

(7) In order to progress from the Bachelor's degree programme to the Master's degree programme, students must meet the requirements for admission to the Master's degree programme pursuant to Section 33 in conjunction with **Appendix 1**.

Section 39 Examination Subjects in the Bachelor's Degree Programme

¹For the Elite degree programme, students take the modules *Experimental physics 3* and *Integrated course 1 and 2* at the Bachelor's level instead of the modules *Experimental physics 3+4*, *Experimental physics 6* and *Theoretical physics 3 and 4*. The modules *Mathematics 3 for physics students (MP-3)* and *Theoretical physics 2: Field theory (TPF-2)* are compulsory and must be taken. ²The module *Laboratory course in physics 2* is replaced by the module *Research-related project work*. ³In the elective physics subjects, the *Physics seminar* module is replaced by the *Study workshop* module. In addition, at least 20 ECTS credits must be acquired from elective subjects, of which at least 5 ECTS credits must be acquired from physics-related and 10 ECTS credits from non-physics related electives. ⁴The Bachelor's colloquium shall be omitted. ⁵At least 2 ECTS credits must be obtained in the key qualifications area. ⁶See **Appendix 5** for the structure of the study plan. ⁷Achievements may be completed either at FAU or at the University of Regensburg. ⁸The average grade for integrated courses and other achievements must be 'sehr gut' (very good; at least 1.5) every semester; otherwise section 41 shall apply. ⁹The selection committee may grant exemptions from this provision in exceptional cases. ¹⁰Due to the specific subject skills that must be acquired as part of the learning outcomes of the consecutive degree programme as defined in the module description, each module may only count once.

Section 40 Examination Subjects in the Master's Degree Programme

¹In the Elite degree programme, two *Research-oriented project* modules must be completed at the Master's level. A total of three such modules are taken during the consecutive degree programme. At least one must be from the field of experimental physics and at least one from the field of theoretical physics. ²Instead of the modules *Advanced experimental physics 1* and *Advanced theoretical physics 1*, the module *Integrated course 3* must be completed. ³A further *Study workshop* module shall be taken instead of the module *Physics seminar*. ⁴Section 39 sentences (6) to (10) shall apply accordingly.

Section 41 Transfer to the Regular Bachelor's or Master's Degree Programme

¹If the achievements according to Sections 39 and 40 were completed successfully but the required grade average was not achieved, or if the student decides to discontinue the Elite degree programme for other reasons, they shall be entitled to transfer back to the regular Bachelor's degree programme in Physics, or continue their studies in the regular Master's degree programme provided the Bachelor's examination was completed successfully and the student passed the qualification assessment process pursuant to Section 33 in conjunction with **Appendix 1**. ²The following equivalences shall apply to the Bachelor's degree programme:

1. If the student changes after the third semester, the module *Theoretical physics 2: Electrodynamics* shall be covered by the module *Theoretical physics 2: field theory* and the module *Experimental physics 3* shall cover part 1 of the module *Experimental physics 3+4*.
2. If the student changes after the fourth semester, part 2 of the module *Experimental physics 3+4* and the module *Theoretical physics 3* shall be covered by the module *Integrated course 1* and the module *Physics seminar* shall be covered by the module *Study workshop 1*.
3. If the student changes after the fifth semester, the modules *Experimental physics 6* and *colloquium in Theoretical physics* shall be covered by the course *Integrated course 2*.

4. One *Research-oriented project* module from the field of experimental physics shall cover the *Physics experiments 2* module. Further *Research-oriented project* modules may each be accredited as one *elective physics module*.

³The following equivalences shall apply to the Master's degree programme:

1. The module *Integrated course 3* is equivalent to one *Advanced experimental physics (EV-B)* module and one *Advanced theoretical physics (TV-A)* module
2. One *Study workshop* module and one *elective physics course (PW)* module replace the module *Physics seminar (PS)*
3. All other *elective physics course (PW)* modules are accredited in full
4. One *Research-oriented project* module replaces one *Advanced lab courses and projects* module.

⁴In any case of doubt or in the event that modules have not been completed in the order prescribed in **Appendices 2, 3** or **5**, the decision shall be taken by the Examinations Committee.

Part III: Transitional and Final Provisions

Section 42 Legal Validity

(1) ¹These examination regulations shall come into effect on 1 October 2007. ²They shall apply to students starting a degree programme from the winter semester 2007/08 onwards. ³At the same time as these examination regulations come into effect, the Diplom Examination Regulations for Students of Physics at FAU (Diplomprüfungsordnung für Studenten der Physik an der Friedrich-Alexander-Universität Erlangen-Nürnberg) from 22 October 1981 (KMBI II 1982, p.157), last amended by statute from 20 August 2004, shall cease to be in force.

(2) ¹Students who were enrolled in the Diplom degree programme Physics when these examination regulations came into effect shall sit their examinations according to the Diplom examination regulations according to (1)(3). ²Students shall complete the Diplom intermediary examination and the examinations of the first part of the degree programme by the end of the winter semester 2008/09; the Diplom examination may be sat until the end of the summer semester 2011. ³The Examinations Committee may grant exceptions in individual cases insofar as the application of this provision does not lead to an unintended case of hardship.

(3) ¹The amendments of 29 September 2010 shall come into effect on the day after their publication. ²They shall apply to students starting their studies from the winter semester 2010/2011 onwards. ³All students who started their studies in the winter semester 2009/2010 may choose whether they want to study under the new or the old examination regulations. ⁴Students must declare their choice to the Examinations Office by 10 November 2010. ⁵If no choice is declared, the study plan before the winter semester 2010/2011 shall apply. ⁶Modules and examinations according to the examination regulations before these amendments that have been replaced with these amendments but continue to be offered for current cohorts shall be offered for the last time in the summer semester 2012. ⁷The amendments under No. 2 shall come into effect after ministerial approval is given; however, the first cohort this amendment shall apply to shall be the one to complete their studies in the winter semester 2010/2011.

(4) ¹The fifth amendment statute shall come into effect on the day after its publication. ²It shall apply to all students starting a degree programme from the winter semester 2018/2019 onwards.

Part IV: Appendices

Appendix 1: Qualification Assessment Process according to Section 33

(1) ¹The qualification assessment process shall be carried out as necessary but at least once per semester. ²In the interest of facilitating a prompt continuation of studies, those who are about to complete their Bachelor's degree programme shall also be entitled to participate in this qualification assessment process.

(2) ¹Applications for admission to the qualification assessment process must be submitted to the University (Master's Office) by 15 July for the winter semester and 15 January for the summer semester

²The application shall contain:

1. University degree certificate (Section 33 (1)) or, in the case of (1)(2) a transcript of records,
2. in the case of (1)(2), confirmation that the applicant has been admitted to the examinations concluding the Bachelor's degree programme within the current examination period; for Bachelor's students according to these examination regulations, the registration for the Bachelor's thesis shall suffice,
3. Application form,
4. CV in German or English, in tabular form,
5. proof of English language proficiency equivalent to CEFR (Common European Framework of Reference for Languages) level 'B2 – Vantage or upper intermediate'; six years of English lessons at a German Gymnasium shall also suffice as proof; applicants whose native language is English need not submit any such proof.

³An extended deadline for later submission of the documents described in (2)(2) may be set.

(3) Applications not submitted in due form or time shall lead to exclusion from the qualification assessment process.

(4) ¹The qualification assessment process shall consist of a preselection and a selection interview with the admitted applicants. ²The Admissions Committee shall be entitled to task individual members with the preselection.

(5) ¹Particularly qualified applicants shall be admitted to the Master's degree programme based solely on the preselection. ²In particular, applicants shall be considered as particularly qualified if they have a degree according to Section 33 (1) with a grade of 2.5 ('gut/good) or better; Section 12 (3) shall apply to degrees with a different grading system.

(6) ¹Applicants who cannot be admitted to the Master's degree programme on the basis of the preselection alone and whose previous average grade is between 2.51 and 3.00 shall be invited to a selection interview; the remaining applicants shall not be admitted to the selection interview and shall receive a rejection notification including reasons. ²The selection interview is intended to demonstrate that the applicant possesses the required technical and methodological expertise and can be expected to carry out independent scientific work in the more research-oriented Master's degree programme. ³The following criteria, weighted equally, shall be assessed in the selection interview:

- Sound knowledge of physical conservation laws, equations of motion and how to solve them, electromagnetic fields and their phenomena, and the mathematical foundations of physics,
- good knowledge of the physical properties of elementary particles, atomic nuclei, and atoms, as well as many-body systems and condensed matter including the fundamental experimental methods required to characterise them,
- Knowledge of the foundations of and methods used in theoretical physics, in particular mechanics, classical field theory, quantum mechanics and statistical physics

⁴The selection interview shall have a duration of approximately 30 minutes. ⁵With the applicant's consent, the selection interview may also be carried out via video call. ⁶Applicants

shall be notified of the date of the interview at least one week in advance. ⁷The selection interview shall be carried out by at least two professors from the Physics degree programme (selection committee) appointed by the Admissions Committee. ⁸After the selection interview, the candidate shall be rated as 'geeignet' (qualified) or 'nicht geeignet' (not qualified). ⁹If the applicant passes the selection interview, the Admissions Committee shall decide at the selection committee's recommendation whether admission shall be granted with conditions according to Section 33 (3)(3). ¹⁰Records shall be kept of the selection interview.

(7) Applicants not admitted to the Master's degree programme after the qualification assessment process shall receive a rejection notification including reasons and information on the legal remedies available; taking part in the qualification assessment process more than once shall be permitted.

(8) Applicants shall bear their own costs incurred as a result of taking part in the selection interview.

Appendix 2: Structure of the Bachelor's Degree Programme in Physics (BSc)

¹The Bachelor's degree programme in Physics generally comprises the modules listed in Table 1. ²Students shall successfully complete a selection of these according to the requirements stipulated in Section 31. ³The Computational methods in physics module may be replaced by one of the elective modules. ⁴The elective and key qualification modules may deviate in ECTS credits, SWS, allocation to semesters or allocation to physics or non-physics elective areas from the details given in the table below; further details are stipulated in the module handbook. ⁵The Examinations Committee may also admit ungraded modules for the elective subjects.

Abbreviation	Module title	Courses/lectures	Module type ¹⁾	SWS (semester hours per week) ²⁾				ECTS credits Total ³⁾	Workload ³⁾ per semester in ECTS credits						Type and scope of examination/course achievement	Grade factor final grade
				L	T	P	S		Semester							
									1	2	3	4	5	6		
EP-12	Experimental physics 1+2	Experimental physics 1: Mechanics	C	5	2			15	7.5						Written examination (120 min)	0
		Experimental physics 2: Thermodynamics and electrodynamics		5	2					7.5						
RMP	Computational methods in physics	Computational methods in physics, part 1	E	2				(5)	(2.5)					Ungraded written examination (90 min)	0	
		Computational methods in physics, part 2		2						(2.5)						
GP-1	Introductory laboratory course 1	Introductory laboratory course 1 Part 1	C			4		5	2.5					Ungraded course achievement: Practical achievement pursuant to Section 18b	0	
		Introductory laboratory course 1 Part 2				4				2.5						
MP-1	Mathematics 1 for physics students	Analysis 1	C	4	2			15	7.5					2 written examinations (90 min each); only one has to be passed	0	
		Linear algebra 1		4	2				7.5							
NW-1	Non-physics elective 1 pursuant to Section 31 (5) sentences 3-5	Non-physics elective 1 Part 1	E	⁴⁾				10	5					As stipulated in subject's regulations ⁴⁾	0	
		Non-physics elective 1 Part 2							5							
TP-1	Theoretical physics 1: Mechanics		C	4	3			10		10				Written examination (120 min)	0	
MP-2	Mathematics 2 for physics students ⁵⁾		C	4	2			7.5		7.5				Written examination (90 min)	0	
EP-34	Experimental physics 3+4	Experimental physics 3: Optics and quantum phenomena	C	4	2			15			7.5			Oral examination (30 min)	1	

Abbreviation	Module title	Courses/lectures	Module type ¹⁾	SWS (semester hours per week) ²⁾				ECTS credits Total ³⁾	Workload ³⁾ per semester in ECTS credits						Type and scope of examination/course achievement	Grade factor final grade
				L	T	P	S		Semester							
									1	2	3	4	5	6		
		Experimental physics 4: Atomic and molecular physics		3	2						7.5					
TP-2	Theoretical physics 2: Electrodynamics ⁶⁾		C	4	3			10			10				Written examination (120 min)	1
GP-2	Introductory laboratory course 2		C			8		5			5				Ungraded course achievement: Practical achievement pursuant to Section 18b	0
MP-3	Mathematics 3 for physics students ⁵⁾		C	5	2			(10)			(10)				Written examination (90 min)	1
DV	Data processing for physics		C	2		2		5			5				Practical computer course and ungraded written examination (90 min)	0
TP-3	Theoretical physics 3: Quantum mechanics ⁶⁾		C	4	3			10				10			Written examination (120 min)	1
PE-1	Physics experiments 1	Laboratory: Electronics	C	1		7		10				10			Presentation of the evaluation of an experiment (50 %) and practical achievement pursuant to Section 18b (50 %) (11 experiments)	1
PW	Physics elective pursuant to Section 31 (4)	⁴⁾	E	⁴⁾				15				5	5	5	As stipulated in subject's regulations ⁴⁾	1
EP-5	Experimental physics 5: Nuclear and particle physics ⁷⁾		C	3	2			7.5					7.5		Written examination (90 min)	1
EP-6	Experimental physics 6: Solid-state physics ⁷⁾		C	3	2			(7.5)					(7.5)		Written examination (90 min)	1
TP-4	Theoretical physics 4: statistical physics ⁶⁾		C	4	3			(10)					(10)		Written examination (120 min)	1
PE-2	Physics experiments 2	Advanced practical module	C			10		7.5					7.5		Practical achievement pursuant to Section 18b (7 experiments)	1
TP-K	Colloquium: Theoretical physics	Synopsis of theoretical physics	C		1		1	5					5		Oral examination (30 min)	1
NW	Non-physics elective pursuant to Section 31 (5)	⁴⁾	E	⁴⁾				5					5		As stipulated in subject's regulations ⁴⁾	1
PS	Physics seminar		E				2	5						5	Presentation (45 min) followed by discussion	1
KQ	Key qualifications skills pursuant to Section 31 (6)	⁴⁾	CS	⁴⁾				2.5						2.5	Ungraded course achievement as stipulated in subject's regulations ⁴⁾	0
BA	Bachelor's thesis	Bachelor's thesis	C					15						12	see Section 29	2

Abbreviation	Module title	Courses/lectures	Module type ¹⁾	SWS (semester hours per week) ²⁾				ECTS credits Total ³⁾	Workload ³⁾ per semester in ECTS credits						Type and scope of examination/course achievement	Grade factor final grade	
				L	T	P	S		Semester								
									1	2	3	4	5	6			
		Bachelor's colloquium					2										
Total SWS⁸⁾ and ECTS credits				77		42		180	30	32.5	27.5	32.5	30	27.5			
					43		5										

¹⁾ C = compulsory subjects, E = elective subjects; KQ = key qualifications

²⁾ SWS = semester hours per week; L = lecture; T = tutorial; P = laboratory, practical; S = seminar

³⁾ The ECTS credits in brackets are not taken into account when calculating the workload.

⁴⁾ see Section 31. The type and scope of the examination and the teaching units depend on the specific manner in which the chosen module is taught.

Details are stipulated in the relevant **(degree programme) and examination regulations** and/or the module handbook.

⁵⁾ At least one of the modules MP-2 and MP-3 must be completed successfully.

⁶⁾ At least two of the modules TP-2 to TP-4 must be completed successfully.

⁷⁾ At least one of the modules EP-5 and EP-6 must be completed successfully.

⁸⁾ When calculating semester hours (SWS), the total for module NW-1 was based on 4 lectures, 2 tutorials and 7 practical courses (Astronomy), all other NW and PW modules were based on 2 lectures and 2 tutorials and KQ on 2 lectures.

Appendix 3: Structure of the Master's Degree Programme in Physics (MSc)

¹The Master's degree programme in Physics generally comprises the modules listed in the following table. ²Students shall successfully complete a selection of these according to Section 37. ³Appendix 2 sentences 4 and 5 shall apply accordingly. ⁴The degree programme is structured in such a way that it can be started in the summer semester or in the winter semester.

Abbreviation	Module title	Courses/lectures	Module type ¹⁾	SWS (semester hours per week) ²⁾				ECTS credits Total ³⁾	Workload ³⁾ per semester in ECTS credits				Type and scope of examination/course achievement	Grade factor final grade
				L	T	P	S		Semester					
									1	2	3	4		
EV-1	Advanced experimental physics 1 ⁵⁾	EV-A, EV-B or EV-C (see Section 37 (2))	C	4	3			10	10				Written examination (120 min)	1
TV-1	Advanced theoretical physics 1 ⁶⁾	TV-A or TV-B (see Section 37 (2))	C	4	3			(10)	(10)				Written examination (120 min)	1
WP-1	Advanced lab courses and projects 1	Advanced lab course ⁷⁾	C			7		5	5				Practical achievement pursuant to section 18b (5 experiments)	1
PW	Physics elective course pursuant to Section 37 (4)	⁴⁾	E			⁴⁾		20	10	10			As stipulated in subject's regulations ⁴⁾	1
NW	Elective course (other than physics) pursuant to Section 37 (5)	⁴⁾	E			⁴⁾		5	5				As stipulated in subject's regulations ⁴⁾	1
EV-2	Advanced experimental physics 2 ⁵⁾	EV-A, EV-B or EV-C (see Section 37 (2))	C	4	3			(10)		(10)			Written examination (120 min)	1
TV-2	Advanced theoretical physics 2 ⁶⁾	TV-A or TV-B (see Section 37 (2))	C	4	3			10		10			Written examination (120 min)	1
WP-2	Advanced lab courses and projects 2	Advanced lab course ⁷⁾	C			7		5		5			Practical achievement pursuant to section 18b (7 experiments)	1
PS	Physics seminar		E				2	5		5			Presentation (45 min) followed by discussion	
FO-1	Specialisation phase pursuant to Section 35		C			12		15			15		Ungraded course achievement: Introduction to the topic of the research phase (approx. 450 hours)	0
FO-2	Project planning and preparation pursuant to Section 35		C			12		15			15		Ungraded course achievement: Preliminary work on research project (approx. 450 hours)	0
FO-3	Master's thesis	Master's thesis	C					30				25	see Section 34 (1) sentence 2 and Section 35	2
		Master's colloquium				2	5							
Total SWS⁹⁾ and ECTS credits				26				120	30	30	30	30		
				22	36	4								

¹⁾ C = compulsory subjects; E = elective subjects

²⁾ SWS = semester hours per week; L = lecture; T = tutorial; P = laboratory, practical; S = seminar

- ³ The ECTS credits in brackets are not taken into account when calculating the workload.
- ⁴⁾ see Section 37 The type and scope of the examination and the teaching units depend on the specific manner in which the chosen module is taught. Details are stipulated in the relevant **(degree programme) and examination regulations** and/or the module handbook.
- ⁵⁾ At least one of the modules EV-1 and EV-2 must be completed successfully.
- ⁶⁾ At least one of the modules TV-1 and TV-2 must be completed successfully.
- ⁷ As well as the Advanced lab course, there are other options, such as Advanced projects in computational physics.
- ⁸⁾ When calculating semester hours (SWS), the total for modules WP 7P and PW and NW modules were based on 2 lectures and 2 tutorials for every 5 ECTS credits.

Appendix 4: Specialisation in the Master's degree programme

(1) ¹The Master's degree programme in Physics can be taken with a specialisation corresponding to the current main research focus areas at the Department of Physics.

²Specialisations currently offered are:

1. Astrophysics and astroparticle physics
2. Condensed matter physics
3. Optical sciences
4. Physics in life sciences
5. Theoretical physics.

³The Examinations Committee may approve further specialisation options. ⁴Students who choose a specialisation concentrate on this in the specialisation phase and choose a relevant topic in the research phase, allowing them to acquire extensive knowledge and skills in the respective area of physics that make them particularly suited for completing a doctoral degree in that area or for taking on a challenging position in research and development. ⁵For the specialisation in *Astrophysics and astroparticle physics*, this would include positions in areas such as measurement technology for rapid processes, artificial intelligence and information technology for distributed systems. ⁶For the specialisation in *Condensed matter physics*, this would include positions in areas such as the semiconductor industry, materials development and mechanical and automotive engineering. ⁷For the specialisation in *Optical sciences*, this would include activities in areas such as optics, information technology and photonics. ⁸Students who choose the specialisation *Physics in life sciences* are qualified for working in the area of medical engineering and areas where physics and life sciences overlap. ⁹The *Theoretical physics* specialisation focuses on activities in areas such as system analysis, risk management and data processing.

(2) ¹In order to complete the Master's degree programme with one of these specialisations, at least 30 ECTS credits must be acquired from modules which are assigned to this specialisation in the module handbook. ²The topic of the research phase also has to relate to the specialisation.

(3) If the Master's degree programme is completed successfully pursuant to (1) and (2), the student can request the following addition to the degree certificate: 'Focus on <specialisation>', with <specialisation> being replaced with the specialisation according to (1).

Appendix 5: Structure of the Elite Degree Programme

¹The Elite degree programme generally comprises the modules listed in the following table, which belong to the Bachelor's degree programme or to the Master's degree programme respectively. ²Students must successfully complete the modules in the first two subject semesters in order to gain admission to the Elite degree programme (Section 38 (2)(2)(3)). ³Appendix 2 sentences 4 and 5 shall apply accordingly.

Abbreviation	Module title	Teaching unit	Type of module ¹⁾	SWS (semester hours) Total ²⁾				ECTS credits		Distribution of workload per semester in ECTS credits								Type and scope of the examination/course achievement	Grade factor final grade	
				L	T	P	S	BSc	MSc	Semester										
										1	2	3	4	5	6	7	8			
EP-12	Experimental physics 1+2	Experimental physics 1: Mechanics ^(a)	C	5	2			15		7.5									Written examination (120 min)	0
		Experimental physics 2 : Thermodynamics and electrodynamics		5	2						7.5									
RMP	Computational methods in physics	Computational methods in physics, part 1	E	2				5		2.5								Ungraded written examination (90 min)	0	
		Computational methods in physics, part 2		2							2.5									
GP-1	Introductory laboratory course 1	Introductory laboratory course 1, part 1	C			4		5		2.5								Practical achievement pursuant to Section 18b	0	
		Introductory laboratory course 1, part 2				4					2.5									
MP-1	Mathematics 1 for physics students	Analysis 1	C	4	2			15		7.5								2 written examinations (90 min each); only one must be passed	0	
		Linear algebra 1		4	2						7.5									
NW-1	Non-physics elective 1 pursuant to Section 31 (5) sentences 3-5	Non-physics elective 1, part 1	E	³⁾				10		5									As stipulated in subject's regulations ³⁾	0
		Non-physics elective 1, part 2									5									
TP-1	Theoretical physics 1: Mechanics		C	4	3			10			10							Written examination (120 min)	0	
MP-2	Mathematics 2 for physics students		C	4	2			7.5			7.5							Written examination (90 min)	0	
EP-3	Experimental physics 3	Optics and quantum effects	C	4	2			7.5				7.5						Oral examination (30 min)	1	

Abbreviation	Module title	Teaching unit	Type of module ¹⁾	SWS (semester hours) Total ²⁾				ECTS credits		Distribution of workload per semester in ECTS credits								Type and scope of the examination/course achievement	Grade factor final grade	
				L	T	P	S	BSc	MSc	Semester										
										1	2	3	4	5	6	7	8			
GP-2	Introductory laboratory course 2	Practical project	C			8		5				5							Practical achievement pursuant to Section 18b	0
TPF-2	Theoretical physics 2: Field theory		C	4	3			10				10							Written examination (120 min)	1
MP-3	Mathematics 3 for physics students		C	5	2			10				10							Written examination (90 min)	1
V	Data processing for physics		C	2		2		5				5							Practical computer course and ungraded written examination (90 min)	0
FP	Research-oriented project		C			10		6				6							Final report (approx. 20 pages)	1
IK-1	Integrated course 1	Quantum theory, quantum optics and atomic physics	C	8	5			16					16						Oral examination (45 min)	1
FP	Research-oriented project		C			10			6				6						Final report (approx. 20 pages) ⁴⁾	1
PE-1	Physics experiments 1	Laboratory: Electronics	C	1		7		10					10						Presentation of the evaluation of an experiment (50 %) and practical achievement pursuant to Section 18b (50 %) (11 experiments)	1
NW	Non-physics elective pursuant to Section 31 (5) sentences 6 to 7	³⁾	E			³⁾		5					5						As stipulated in subject's regulations ³⁾	1
KQ	Key qualifications	³⁾	CS			³⁾		2					2						As stipulated in subject's regulations ³⁾	0
ST-1	Study workshop 1	Workshop with presentation	C				2	3						3					Presentation (30 min) on one FP module or Bachelor's thesis	1
IK-2	Integrated course 2	Statistical mechanics and condensed matter physics	C	8	5			16						16					Oral examination (45 min)	1
FP	Research-oriented project		C			10			6					6					Final report (approx. 20 pages) ⁴⁾	1
PW	Physics elective pursuant to Section 31 (4)	³⁾	E			³⁾		5						5					As stipulated in subject's regulations ³⁾	1

Abbreviation	Module title	Teaching unit	Type of module ¹⁾	SWS (semester hours) Total ²⁾				ECTS credits		Distribution of workload per semester in ECTS credits								Type and scope of the examination/course achievement	Grade factor final grade	
				L	T	P	S	BSc	MSc	1	2	3	4	5	6	7	8			
NW	Elective course (other than physics) pursuant to Section 37 (5)	³⁾	E	³⁾					5						5				As stipulated in subject's regulations ³⁾	1
IK-3	Integrated course 3	Quantum field theory and particle physics	C	8	5				16						16			Oral examination (45 min)	1	
PW	Elective physics course pursuant to Section 37 (4)	³⁾	E	³⁾					24						10	14			As stipulated in subject's regulations ³⁾	1
ST-2	Study workshop 2	Workshop with presentation	C				2		3						3			Presentation (30 min) on one FP module or Bachelor's thesis	1	
BA-1	Bachelor's thesis		C					12							12			see Section 29	2	
FO-1	Specialisation phase pursuant to Section 35		C			12			15							15		Ungraded course achievement: Introduction to the topic of the research phase (approx. 450 hours)	0	
FO-2	Project planning and preparation pursuant to Section 35		C			12			15							15		Ungraded course achievement: preliminary work on conducting research project (approx. 450 hours)	0	
FO-3	Master's thesis	Master's thesis	C						30								25	see Section 34 (1)(2) and Section 35	2	
		Master's colloquium				2										5	2			
Total SWS⁵⁾ and ECTS credits				90	86				180	120	32.5	35	43.5	42	42	45	30	30		
				53			6													

¹⁾ C = compulsory subjects, E = elective subjects; KQ = key qualifications.

²⁾ SWS = semester hours per week; L = lecture; T = tutorial; P = laboratory, practical; S = seminar.

³⁾ see Section 37. The type and scope of teaching units and examinations depend on the specific manner in which the respective module is taught and are regulated by the applicable (**degree programme and) examination regulations** and/or the module handbook.

⁴⁾ The scope of the final report depends on the nature of the individual research project and may be more or less than stated above.

⁵⁾ When calculating semester hours (SWS), the total for module NW-1 was based on 4 lectures, 2 tutorials and 7 practical courses (Astronomy), all other NW and PW modules were based on 2 lectures and 2 tutorials per ECTS credits and SQ on 2 lectures.

Appendix 6: Glossary of English terms

English term	German translation
Advanced experimental physics	Fortgeschrittene Experimentalphysik
Advanced lab courses and projects	Fortgeschrittene Praktika und Projekte
Advanced quantum mechanics	Fortgeschrittene Quantenmechanik
Advanced solid state physics	Fortgeschrittene Festkörperphysik
Advanced theoretical physics	Fortgeschrittene theoretische Physik
Common European Framework of Reference for Languages (CEFR)	Gemeinsamer Europäischer Referenzrahmen für Sprachen
Computational Physics	Computerphysik
Elective course	Wahlfach
Elective course (other than physics)	Nichtphysikalisches Wahlfach
European Credit Transfer System (ECTS)	Europäisches System zur Anrechnung von Studienleistungen
Lasers, atomic physics and quantum optics	Laser, Atomphysik und Quantenoptik
Master's colloquium	Masterkolloquium
Master's thesis	Masterarbeit
Particle physics	Teilchenphysik
Particle and astroparticle physics	Teilchen- und Astroteilchenphysik
Physics seminar	Physikalisches Seminar
Presentation	Vortrag
Project planning and preparation	Projektplanung und -vorbereitung
Quantum field theory	Quantenfeldtheorie
Research-oriented project	Forschungsorientierte Projektarbeit
Solid state physics	Festkörperphysik
Specialisation phase	Spezialisierungsphase
Study workshop	Studientage
Vantage or upper intermediate	Obere Mittelstufe
Workload	Arbeitsbelastung