

**Joint Examination Regulations**  
**for the joint Master's degree program**  
**“Advanced Methods in Particle Physics”**  
at the Department of Physics of TU Dortmund University (TUDO), Germany,  
and  
the Department of Physics and Astronomy at the Alma Mater Studiorum –  
Università di Bologna, ITALY (UNIBO),  
and  
the Ecole Universitaire de Physique et d'Ingénierie at the Université Clermont  
Auvergne, FRANCE (UCA),

from December 22<sup>nd</sup> 2021

On the basis of Section 2 (4) in conjunction with Section 64 (1) of the Higher Education Act of the State of North Rhine-Westphalia (*Hochschulgesetz NRW*, HG) of 16 September 2014 (GV.NRW. p.547), as last amended by Article 2 of the Act Amending the Higher Education Act and Amending Other Provisions in Higher Education of 25 March 2021 (GV.NRW. p.331) and on the basis of the “Italian Ministerial Decree 6/2019 describing the requirements for the setting up of the interuniversity degree program” and the “French circulaire n° 2019-134 du 25-9-2019: Modalités d'élaboration et de délivrance des diplômes nationaux et de certains diplômes d'État par les établissements d'enseignement supérieur relevant du ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation” and in particular its “Title II for the issuance of degrees in the framework of an international partnership”, TU Dortmund University, the UNIBO and the UCA have issued the following regulations:

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## General

### Section 1

#### Scope of validity of the Master's examination regulations

- (1) These Master's examination regulations apply to the joint Master's degree program "Advanced Methods in Particle Physics" at the Department of Physics of TU Dortmund University, the Department of Physics and Astronomy at the Alma Mater Studiorum - Università di Bologna, ITALY (UNIBO) and the Ecole Universitaire de Physique et d'Ingénierie at the Université Clermont Auvergne, FRANCE (UCA). It regulates the structures of the Master's degree program according to Section 64 Higher Education Act of the State of North Rhine-Westphalia (*Hochschulgesetz NRW*, HG).
- (2) The module descriptions in the module handbook describe the individual study elements, the teaching content and the competences to be acquired. They are not part of these examination regulations. They are decided by the responsible department councils and must be reported to the Rectorate of TUDO.

### Section 2

#### Study objectives and purpose of Master's examination

With the successful completion of the Master's degree program, a further professionally qualifying degree is acquired. By successfully completing the degree program, candidates have demonstrated that they have learned advanced technical knowledge, skills and methods that are required for scientific work and for scientifically-oriented professional activity and that enable them to critically classify new scientific findings and use them in professional practice. This knowledge and these skills are imparted by means of a specialization in scientific issues in particle physics. The methodological focus is on modern methods in instrumentation, data analysis and scientific computing.

### Section 3

#### Admission requirements

Admission to the joint Master's degree program "Advanced Methods in Particle Physics" (*Teilchenphysik*) is granted to those who fulfil the requirements of the admission regulations for the Master's degree program "Advanced Methods in Particle Physics" of the Department of Physics at TU Dortmund University.

### Section 4

#### Master's degree

Based on the successful completion of the Master's examination, TU Dortmund University with its Department of Physics and the Department of Physics and Astronomy of the Alma Mater Studiorum - Università di Bologna, ITALY (UNIBO) and the Ecole Universitaire de Physique et d'Ingénierie of the Université Clermont Auvergne, FRANCE (UCA) jointly award the academic degree "Master of Science" ("M.Sc.").

## **Section 5**

### **Credit point system**

- (1) The degree program is based on a credit point system which is compatible with the European Credit Transfer System (ECTS).
- (2) Each module is assigned a number of credit points according to its study workload. One credit point within the meaning of these examination regulations corresponds to one ECTS credit point and is awarded for a performance that requires a workload of approximately 30 hours. As a general rule, 30 credit points are to be acquired per semester.
- (3) Credit points are awarded on the basis of successfully and fully completed modules.

## **Section 6**

### **Standard program duration, scope of studies and study structure**

- (1) The standard program duration of the Master's degree program is four semesters (two years) and includes the completion of the Master's thesis.
- (2) The Master's degree program comprises a total of 120 credit points, equivalent to approximately 3,600 student working hours and distributed among compulsory and compulsory elective subjects.
- (3) The Master's degree program is divided into modules, each of which extends over a maximum of two consecutive semesters. These modules are self-contained units of study, rounded off in terms of content and time, normally comprising a workload of at least 5 credit points.
- (4) This is an international Master's degree program in which the courses and examinations are conducted in English.
- (5) The degree program can only be taken up in the winter semester.
- (6) The structure of the Master's degree program as well as the modules, including the credit points to be acquired and the type of examination (module examination or partial examinations/coursework), are depicted in the appendix to these examination regulations.

## **Section 7**

### **Contents of studies**

- (1) The first semester is compulsory for all enrolled students to take place at the Université Clermont Auvergne, FRANCE (UCA), the second semester at TU Dortmund University (TUDO) and the third semester at the Alma Mater Studiorum - Università di Bologna, ITALY (UNIBO). In addition to the specialist education in particle physics, each of the three universities focuses on methods and techniques from the fields of machine learning and statistics (UCA), instrumentation (TUDO) and scientific computing (UNIBO).
- (2) The fourth semester can be carried out at one of the participating universities or at an associated partner of the student's choice. The choice must be declared in writing on the form provided for this purpose by the end of the third semester at the latest. The Joint Examination Board examines the student's application and confirms the choice of the desired university. In exceptional and particularly justified cases, the Joint Examination Board may specify a university other than the one chosen by the student. After the approval of the study at the desired university, a change of the desired university is excluded.
- (3) The Master's thesis is written in the fourth semester at the chosen university or at an associated partner institution. The final examination is usually taken at TUDO. The regulations of Sections 18 and 19 apply accordingly.

## Section 8

### Admission to courses with limited number of participants at TUDO

- (1) The courses of the joint Master's degree program "Advanced Methods in Particle Physics" which are held at TUDO may be limited in the number of participants for the reasons stated in Section 59 (2) sentence 1 Higher Education Act (*Hochschulgesetz*, HG).
- (2) The determination of the limitation of the number of participants as well as a maximum number of participants for the respective courses is made by the Department Council of the Department of Physics of TUDO and shall be announced in an appropriate manner.
- (3) If the number of applicants exceeds the admission capacity, the according teacher can request that the Dean or a teacher charged with this task by the Dean shall regulate admission with the participation of the Department's Commission for Teaching and Studies. Applicants have to be considered in the following order:
  1. Students who, within the framework of their chosen degree program, depend on attending the course at this time according to their study schedules.

Dependent are those students, on the one hand, for whom the course is intended according to the module descriptions of the module handbook and the study plan in the semester in which the course is offered; and on the other hand, students who are in the last semester of their studies according to the standard program duration or in a later semester and need the course in order to complete their studies in the standard program duration or in a timely manner.
  2. Students who, within the framework of their chosen degree program, do not depend on attending the course at this time according to their study schedules or students who, according to Section 52 (2) HG, are admitted as cross-registered students and who, according to their study plan, are dependent on attending the course at this point in time within the framework of their chosen degree program.
  3. Students who are admitted to the respective course as cross-registered students according to Section 52 (1) HG.
  4. Other students of TU Dortmund University if they meet the requirements for participation in the course.
- (4) Where a selection is required within a group, the candidates shall be considered in the following order:
  1. Students with a long-term or permanent disability, chronic illness or with care requirements (care of children living in the same household who have to be looked after most of the time, care of spouse or registered partner or a relative in the direct line or first-degree relative by birth or by marriage, insofar as the latter is in need of care).
  2. Students for whom it is essential to repeat a course in the respective module.
  3. After the remaining criteria have been exhausted, the decision is made by lot.
- (5) The existence of the conditions related to the criteria according to subsection 4 number 1 and number 2 shall be communicated to the Dean by the applicants themselves during the application procedure within the specified and published deadlines.
- (6) The Department of Physics at TUDO shall ensure, within the limits of the available resources, that the students referred to in subsection 3 number 1 as a rule suffer no loss of time, or at most a loss of time of one semester, as a result of the limitation of the number of participants.

## Section 9 Examinations

- (1) As a rule, modules are completed with only one examination. In particularly justified cases, several modules can also be completed with a joint examination. The module is generally completed with a graded module examination. Exceptionally, a module can also be successfully completed by cumulative graded partial coursework/performances. Partial performances are achieved within the framework of individual courses. The corresponding type of examination and form of examination (module examination or partial performances / *graded or ungraded*) can be found in the appendix to these examination regulations.
- (2) Module examinations or partial performances are usually carried out during the degree program by means of written, oral or electronic examinations or examinations in electronic communication (written examinations, presentations, seminar contributions, homework, portfolios, poster or project presentations and practical examinations, etc.). The responsible examiners can determine other suitable forms of examination with the approval of the examination board.
- (3) The type, form and extent of the module examinations and partial performances are specified in the module descriptions of the module handbook or are announced by the examiner no later than two weeks after the start of the course. In justified cases and upon application via the examination board, the form of performance originally stipulated in the module descriptions of the module handbook may be deviated from for a limited period of time.
- (4) Admission to the individual module examinations or partial performances requires that the examinations designated as prerequisites in the module descriptions of the module handbook / in the appendix to these examination regulations have been successfully passed.
- (5) Access to the courses of a module can be made dependent on certain prerequisites, in particular the successful completion of other modules. The individual access requirements of the modules result from the module descriptions of the module handbook.
- (6) *Written examinations / exam papers* can be carried out in whole or in part using the answer-choice method. Particular care must be taken when using this procedure to ensure that the examination questions are based on the content and required knowledge taught in the modules or the corresponding courses and enable reliable examination results. In the case of examinations which are to be assessed by two examiners, the examination questions shall be drawn up jointly by both examiners. When setting examination questions, it must be specified which answers are to be recognized as correct.
- (7) *Written examinations / exam papers* are conducted under supervision and are not open to the public. Any approved aids will be announced by the examiners at the latest four weeks before the examination. The assessment of written examination performances is to be made known to the students after 8 weeks at the latest, whereby the requirements of data protection are to be observed.
- (8) For module examinations, a minimum of 1 and a maximum of 3 hours should be allowed for *written examinations / exam papers* and a minimum of 15 and a maximum of 45 minutes per student for oral examinations. For partial performances, a maximum duration of 2 hours is to be provided for written examinations / exam papers and a duration of 15 to 30 minutes per student for oral examinations. In oral group examinations, a total duration of 120 minutes may not be exceeded for module examinations and 90 minutes for partial performances.
- (9) Examination performances in written or oral examinations with which a degree program is completed, and in repeat examinations for which no compensation option is provided in the event of a final failure, are to be assessed by at least two examiners within the meaning of

Section 12. In addition to this, oral examinations shall always be taken before several examiners or one examiner in the presence of an expert observer as an individual examination or group examination with a maximum of four students.

- (10) If an oral examination is taken before one examiner, the examiner must hear the expert observer before determining the grade in accordance with Section 17 (1). If an oral examination is taken before two examiners, each examiner shall determine an individual grade for the oral examination performance in accordance with Section 17 (1). The grades for the oral examination performance shall be determined from the arithmetic mean of the two individual grades in accordance with Section 17 (7). If only one examiner grades the oral examination performance with at least "sufficient" (4.0), the examination shall be repeated before two other examiners appointed by the examination board without crediting a failed attempt. The examination is passed if both of the newly appointed examiners assess the examination performance with at least "sufficient".
- (11) The essential items and results of the oral examination shall be recorded in the minutes. The result of the examination shall be announced to the candidate after the examination. Students who wish to take the same examination in a later examination period can be admitted as listeners in accordance with the available space unless the candidate objects. The admission of listeners does not extend to the discussion and announcement of the examination result. In the event of the examination being influenced or disrupted by the members of the audience, these persons may be excluded by the examiner.
- (12) In modules that conclude with a module examination, additional coursework may be required in the individual courses. This may include in particular: presentations, assignments, audited practical tests, practical exercises, written or oral performance reviews, lectures or the writing of minutes. Coursework can be graded or assessed as "passed" respectively "failed". The prerequisite for participation in the module examination is the successful completion of all coursework required in this module.
- (13) The requirements of coursework are clearly below the requirements of a module examination or partial performances in terms of form and content. If the form in which a piece of coursework is to be completed for a module is not defined in the module descriptions of the module handbook, it will be announced by the teacher at the beginning of the course.
- (14) The obligation of regular attendance may be provided for in courses whose learning objective cannot be achieved without the active participation of the students. When regulating compulsory attendance, the constitutional requirement of proportionality must be observed. A decision on compulsory attendance is taken either on the basis of a vote by the Study Advisory Council or on the basis of a two-thirds majority of the Department Council. The compulsory attendance has to be indicated in the module description in the module handbook. The exact details of the compulsory attendance are announced to the students in an appropriate form at the beginning of the course.
- (15) For the examinations at the UCA or the UNIBO, other regulations may apply which deviate from these.

## Section 10

### Disadvantage compensation

- (1) If a student submits a medical certificate which proves that he or she is unable to complete all or part of an examination in the stipulated form, duration or time limit due to a long-term or permanent disability or chronic illness, the chairperson of the Examination Board shall determine the other form, duration or time limit in which the examination is to be completed. This also applies to the acquisition of a participation requirement. Furthermore, deviations may be provided with regard to the use of aids or assistants as well as to the

number of and requirements for the repetition of examination performances. This should apply to all examinations to be taken during the course of the degree program in the case of persons with a disability or chronic illness, unless a change in the illness or disability is to be expected. In the case of doubt, the person or office responsible for questions concerning the interests of disabled students (e.g. the Department of Disability and Studies, **Center for Higher Education** at TU Dortmund University) shall be involved.

- (2) Compensation for disadvantages is granted on a case-by-case basis upon application to the Examination Board and must be submitted to the Central Examinations Office of TUDO.

## Section 11

### Maternity protection

The statutory maternity protection periods as well as the corresponding provisions of the Maternity Protection Act (*Mutterschutzgesetz*, MSchG) apply to studies at TU Dortmund University, cf. Section 64 (2) no.5 and (2a) HG NRW. At the UCA or the UNIBO, other regulations may apply which deviate from these.

## Section 12

### Time limits and deadlines

- (1) For each examination that takes place at TU Dortmund University, registration is required at least two weeks before the start of the respective examination. The registration period must be at least two weeks. Deregistration without giving reasons is possible up to one week before the start of the respective examination in the case of oral examinations and up to one day before the start of the respective examination in the case of written examinations. Then, the student is deemed as not to have registered for the examination. Different regulations may apply for examinations conducted by another department within the framework of the degree program.
- (2) The dates for written examinations are set by the chairperson of the Examination Board and are to be announced as early as possible, as a rule four weeks before the end of the lecture period. Periods for oral examinations shall be announced at least four weeks before the earliest examination date. Individual dates are announced one week before the examination.
- (3) Provided that a proper examination procedure is ensured, the Examination Board may, in order to promote internationality, grant exceptions to the examination procedure with regard to the type, place and time of the examination upon prior application and with the consent of the examiner, provided that the student is unable to take part in the examinations on site at TU Dortmund University at the scheduled examination time for a justifiable and documented reason or if participation would be unreasonable. The application must be submitted to the chairperson of the Examination Board in good time before the start of the examination procedure, at the latest two weeks before the examination date, and must be justified in writing.
- (4) Examination procedures take into account the periods of absence due to the care of children living in the household who are mainly to be cared for, the care of the spouse, the registered partner or a relative in the direct line or first-degree relative by marriage or birth, insofar as the latter is in need of care.
- (5) At the UCA or the UNIBO, other regulations may apply which deviate from these.



### Section 13

#### Repetition of examinations, passing the Master's examination, final failing of an examination

- (1) The module examinations and the individual partial performances can be repeated twice if they have not been passed or are deemed as failed. If a partial performance is not passed, only this must be repeated. For reasons of comparability and fairness, repeat examinations at TU Dortmund University must be carried out in the same form as the first attempt at the examination. Examinations that have been passed cannot be repeated. Before the grade "insufficient (5.0)" is determined after the second unsuccessful repetition of a written examination taken at TU Dortmund University, the student must be given the opportunity to take an oral supplementary examination. The possibility of conducting a supplementary oral examination exists only once for a single examination performance. For the taking and assessment of the oral supplementary examination, Section 8 (9) and Section 16 apply accordingly. On the basis of the oral supplementary examination, the grade "sufficient" (4.0) or "insufficient" (5.0) is determined. The overall result is to be documented in a protocol and announced to the student after the oral supplementary examination. If the date set by the Examination Board for an oral supplementary examination is missed without justifiable reason, the examination is deemed as definitively failed. The oral supplementary examination is excluded if the grade "insufficient" (5.0) was determined due to an attempt to deceive, a failure to attend or a withdrawal without good cause in accordance with Section 14.
- (2) In deviation from subsection 1, the Master's thesis can only be repeated as a whole and then only once with a new topic. A return of the topic of the Master's thesis in accordance with Section 18 (4) is only permitted if the candidate did not make use of this option when preparing the unsuccessful Master's thesis.
- (3) Internships and coursework can be repeated as often as desired.
- (4) The definite failure of compulsory elective modules can be compensated by other successfully completed compulsory elective modules.
- (5) The Master's examination is passed if all 120 credit points from the module examinations and partial performances as well as for the Master's thesis have been acquired.
- (6) The Master's examination as a whole is definitively failed if
  - a) the Master's thesis after repetition is failed again or is deemed as failed, or
  - b) a candidate can no longer acquire the required minimum number of credit points, or
  - c) one of the compulsory modules listed in the appendix has been definitively failed.
- (7) If the Master's examination has been definitively failed or if an examination is deemed as definitively failed, the chairperson of the Examination Board shall notify the candidate of this in writing. The decision shall be accompanied by instruction on the right to appeal. On application, the candidate shall be issued with a certificate of the passed examinations; it shall be added that this certificate is not valid for presentation at another German university.

### Section 14

#### Joint Examination Board

- (1) For the organization of the examinations and the tasks assigned by these examination regulations, the responsible committees at the universities involved in the degree program shall form a Joint Examination Board.

- (2) The Joint Examination Board consists of five members, namely three members from the group of university teachers, one member from the group of scientific staff/research assistants and one member from the group of students of the Master's degree program "Advanced Methods in Particle Physics". Each of the participating departments elects one member from the group of university teachers of its department. The Department of Physics at TU Dortmund University elects one member each from the group of scientific staff and one member from the group of students of the Master's degree program "Advanced Methods in Particle Physics". The members are elected by the Department Council separately by groups for three years, the member from the group of students for one year. The Examination Board elects the chairperson and the substitute chairperson from its members from the group of university teachers. Both offices may not be held by members of the same university. The Department Council elects representatives for the members of the Joint Examination Board, with the exception of the chairperson and his/her substitute. A re-election is permitted. The composition of the Joint Examination Board shall be announced by the Dean. If the election of the Examination Board or individual members is declared invalid after taking office, this does not affect the legal validity of the resolutions and official acts previously adopted.
- (3) The Joint Examination Board ensures that the provisions of the examination regulations are complied with and that the examinations are conducted properly. In particular, it is responsible for deciding on appeals against decisions made in the examination procedure. In addition, the Examination Board has to report regularly, at least once a year, to the Department Council on the development of examinations and study times. It makes suggestions for the reform of the examination regulations and the curricula. The Examination Board may delegate the following tasks to the chairperson: questions of recognition, urgent decisions, appeals/complaints, appointment of examiners. Decisions on appeals and the duty to report to the Department Council cannot be delegated to the chairperson of the Examination Board.
- (4) The Joint Examination Board constitutes a quorum if, in addition to the chairperson or the substitute chairperson and one other member from the group of university teachers, at least one other voting member is present. The Examination Board decides by simple majority. In the event of a tie, the chairperson has the casting vote. The student members do not participate in pedagogical-scientific decisions. Such decisions include, in particular, the assessment, the recognition of achievements, the setting of examination tasks and the appointment of examiners and observers.
- (5) The members of the Joint Examination Board have the right to be present during the taking of the examinations.
- (6) The meetings of the Joint Examination Board are not public. The members of the Examination Board, including their substitutes, the examiners and the observers are subject to the obligation of discretion. If they are not employed in public service, they must be sworn to secrecy by the chairperson of the Examination Board.
- (7) The Joint Examination Board uses the administrative assistance of the Central Examinations Office of TU Dortmund University in the performance of its duties.

## **Section 15**

### **Examiners and observers**

- (1) The Joint Examination Board appoints the examiners and observers in accordance with the statutory requirements. It may delegate the appointment to the chairperson of the Joint Examination Board. Teachers of TU Dortmund University and other persons authorized to examine within the meaning of Section 65 (1) HG may be appointed as examiners. As observer may be appointed who has acquired at least the qualification to be determined by

the examination or a comparable qualification. At the UCA or the UNIBO, other regulations may apply which deviate from these.

- (2) The examiners are independent in their examination activities.
- (3) The candidate may propose examiners for the Master's thesis. If possible, the candidate's suggestions should be taken into consideration. However, the suggestions do not constitute a legal claim.

## **Section 16**

### **Recognition of examination achievements, placement into higher program semesters**

The valid recognition regulations of the participating universities shall apply to the recognition of examination achievements and the placement in higher program semesters.

## **Section 17**

### **Absence, withdrawal, deception and violation of regulations**

- (1) An examination is assessed as "insufficient" (5.0) or "failed" if the candidate fails to appear at an examination date without good reason or if he or she withdraws from the examination after it has begun without good reason or if he or she fails to complete a written examination within the specified processing time.
- (2) The reasons asserted for the withdrawal or the failure to attend must be notified in writing without delay to the Joint Examination Board via the office responsible for this at the respective university and must be made credible. In the case of illness of the candidate or of a child who is predominantly to be cared for by the candidate, the submission of a medical certificate in the official language of the university responsible for the respective examination is required. In the case of illness on the part of the candidate, the medical certificate must prove that the candidate is unable to take the examination. In the case of a subsequent withdrawal from an examination already taken, the medical certificate must show that the impairment of performance during the examination was not apparent to the student for health reasons and that there was no reasonable cause to doubt the student's ability to perform. If the Joint Examination Board does not recognize the reasons for the withdrawal or the failure, the candidate will be informed of this decision in writing.
- (3) If an examination performance is influenced by deception or cheating (e.g. use of unauthorized aids, adoption of text passages without reproduction as a quotation, copying, etc.), the examination in question is deemed as "insufficient" (5.0) or "failed". This also applies to attempts at deception. If during an examination an attempt at deception or deception as defined in sentence 1 is detected by the examination supervisor, the supervisor shall record this attempted deception or deception in writing. The decision as to whether there has been an attempt at deception or an act of deception and whether the examination is therefore deemed as "insufficient" (5.0) or "failed" is made by the respective examiner. A candidate who disrupts the orderly conduct of the examination may, as a rule after a warning, be excluded from continuing the examination by the respective examiner or the supervisor. In this case, the examination in question shall be deemed as "insufficient" (5.0) or "failed". The respective reasons for the decision are to be recorded. In serious cases of deception or disruption, the Joint Examination Board may exclude the candidate from taking further examinations.
- (4) In the case of module examinations or partial performances, the Joint Examination Board can demand a written declaration from the candidate that he or she has written the work - in the case of a group work, an appropriately marked part of the work - independently and

has not used any sources or aids other than those specified, and has marked verbatim and analogous quotations. Section 18 (8) remains unaffected by this.

- (5) The candidate may request within a period of 14 days that decisions according to subsection 3 are reviewed by the Joint Examination Board. Incriminating decisions are to be communicated to the candidate in writing without delay, reasons are to be given and instructions on the right to appeal are to be included. Prior to the decision, the candidate must be given the opportunity and right to a hearing.

## **Master's examination**

### **Section 18**

#### **Admission to Master's examination**

- (1) Upon enrolment in the joint Master's degree program "Advanced Methods in Particle Physics" at TU Dortmund University or upon admission as a cross-registered student according to Section 52 (2) HG, a student is considered as admitted to the examinations of this degree program, unless the enrolment or admission is to be refused according to subsection 2.
- (2) Enrolment or admission is to be refused if
  - a) the candidate has definitively failed an examination required by these examination regulations in the Master's degree program "Advanced Methods in Particle Physics" at TUDO, at the UNIBO or at the UCA or in another degree program which has a considerable relation in content to this degree program, or if
  - b) the candidate, after having taken the examination in one of the above-mentioned degree programs, has not yet received a final and legally binding decision on the definite failure due to a subsequent challenge of the examination notice.

### **Section 19**

#### **Scope of Master's examination**

- (1) The Master's examination is composed of:
  - course-related examinations at TUDO amounting to 24 credit points,
  - course-related examinations at the UNIBO amounting to 30 credit points,
  - course-related examinations at the UCA amounting to 27 credit points,
  - course-related examinations in the compulsory electives amounting to 9 credit points, which can be taken in total at the three universities,
  - the Master's thesis within the scope of the "Compulsory elective Master's thesis" to the extent of 18 credit points, and
  - the final examination at TUDO with a total of 12 credit points.
- (2) The type of examination (module examination or partial performances) and the number of credit points to be acquired in each case are specified in the appendix to these examination regulations.

**Section 20**  
**Evaluation of course-related examination performances, acquisition of credit points, calculation of grades**

- (1) The grades for the individual examination performances are set by the respective examiners according to the respective national grading system. At the same time, the international grade corresponding to the determined grade is also listed. The following scheme applies for the translation of the grades from the national to the German grading system:

Italian → German			French → German	
Italian (from / to)		German	French	German
30	30L	1,0	20	1,0
28	29	1,3	19	1,0
27		1,7	18	1,0
26		2,0	17	1,0
25		2,3	16	1,3
23	24	2,7	15	2,0
22		3,0	14	2,3
20	21	3,3	13	2,7
19		3,7	12	3,0
18		4,0	11	3,7
<18		5,0	10	4,0
			<10	5,0

By decreasing and increasing the individual grades by 0.3, intermediate values can be formed for a differentiated assessment. The grades 0.7, 4.3, 4.7 and 5.3 are excluded.

- (2) In agreement with the Joint Examination Board, examination performances which are not taken into account in the overall grade may be evaluated either according to the grading scale pursuant to subsection 1 or according to the following simplified scale:
- passed* = a performance that at least meets the requirements,
- failed* = a performance which no longer meets the requirements due to considerable deficits.
- (3) The number of credit points assigned to the respective module is acquired if the module has been graded with at least "sufficient" (4.0) or "passed".
- (4) A written examination / exam paper at TUDO which has been implemented entirely with the answer-choice method is deemed as passed if
- 60 % of the total number of points to be obtained has been achieved or
  - the obtained score does not fall below the average performance of the candidates who took part in the examination by more than 22 %.
- (5) If the candidate has achieved the minimum pass mark in accordance with subsection 4 and thus has passed the examination, the grade shall be as follows:
- 1 = "very good" if he or she has achieved at least 75 %,

2 = "good" if he or she has achieved at least 50 % but less than 75 %,

3 = "satisfactory" if he or she has achieved at least 25 % but less than 50 %,

4 = 'sufficient' if he or she has none or less than 25 %

of the points to be obtained beyond the minimum quantity of points required for passing.

- (6) If a written examination / exam paper is only partly carried out in the answer-choice method, the exercises in the answer-choice method will be assessed in accordance with subsections 4 and 5. The remaining exercises will be assessed according to their usual procedure. The grade of the examination performance is determined from both assessments, taking into account the proportions of the total number of points to be achieved in each case. Subsection 7 applies accordingly.
- (7) Deviating from the provisions of subsections 2 to 6, other regulations may apply at the UCA and the UNIBO.
- (8) If the module is completed by a module examination, this grade is also the module grade. In the case of partial performances, the module grade is calculated from the arithmetic mean of the non-rounded grades of the partial performances taken within the framework of the respective module, weighted with the corresponding credit points. The module grades according to the German grading system are then in words with an average value of

up to 1.5	=	<i>very good</i>
over 1.5 and up to 2.5	=	<i>good</i>
over 2.5 and up to 3.5	=	<i>satisfactory</i>
above 3.5 and up to 4.0	=	<i>sufficient</i>
above 4.0	=	<i>insufficient.</i>

When calculating the module grades, only the first decimal place after the decimal point is taken into account; all other decimal places are deleted without rounding.

- (9) The overall grade of the Master's examination is calculated from the arithmetic mean of the German grades of all graded modules, including the Master's thesis, formed according to subsection 8, whereby the individual German grades are weighted with the respective number of credit points belonging to this module. For the calculation of the overall grade, the module grades obtained at the partner universities (UCA and UNIBO) must be converted into German grades in accordance with the conversion table pursuant to subsection 1. Subsection 8 applies accordingly. The overall grade of the Master's examination is converted into the national country grades according to the following scheme, with linear interpolation between the interval limits. The grades in the Italian grading system are given without a decimal place after the comma, the grades in the German grading system are given with one decimal place and the grades in the French grading system are given with two decimal places.

German → Italian				German → French			
German from / to		Italian from / to		German from / to		French from / to	
1,29	1,00	110L		1,29	1,00	17,00	20,00
1,69	1,30	110		1,69	1,30	16,00	16,99
1,99	1,70	108	109	2,29	1,70	15,00	15,99
2,29	2,00	107		2,69	2,30	14,00	14,99
2,69	2,30	106		3,29	2,70	13,00	13,99

3,29	2,70	100	105		3,69	3,30	12,00	12,99
3,69	3,30	96	99		4,00	3,70	10,00	11,99
4,00	3,70	60	95					

- (10) Instead of the overall grade "very good", the grade "with distinction" is awarded if the Master's thesis is graded with 1.0 and the arithmetic mean of the module grades weighted with the respective credit points, including the Master's thesis, is not worse than 1.2.
- (11) The overall grade is also shown in the form of a degree according to the European Credit Transfer System (ECTS). In addition to this, ECTS grades can be indicated for all graded examinations. This requires a corresponding resolution of the Joint Examination Board. The grades according to ECTS are reported as follows:
- A = usually the approximately top 10% of the successful students;
  - B = usually the next approximately 25% of the successful students;
  - C = usually the next approximately 30% of the successful students;
  - D = usually the next approximately 25% of the successful students;
  - E = usually the next approximately 10% of the successful students.
- (12) The ECTS grades are principally calculated by comparing the cohorts of the last six semesters. If this group is smaller than 50 persons, the reference group is to be determined from the last 10 semesters. In principle, the current semester is not to be taken into account in the formation of the ECTS grades. As long as no statistical data is available for the calculation of a relative evaluation, no ECTS grades are shown. For reasons of legally secure awarding, the Joint Examination Board can decide not to indicate ECTS grades. The appropriate reference to this appears in the final document. The composition of the comparison group needs to differentiate according to the degree and the degree program. In addition, in objectively justified cases, a different composition of the comparison group can take place. This requires a corresponding resolution of the Joint Examination Board.

## Section 21 Master's thesis

- (1) With the Master's thesis, candidates should demonstrate that they can independently work on a problem setting in physics according to scientific methods and within a given period of time.
- (2) The Master's thesis can be issued and supervised at the universities involved in the degree program by the university professors or members with a postdoctoral lecture qualification (*Habilitation*) who teach courses in the Master's degree program "Advanced Methods in Particle Physics". Other scientists who fulfil the requirements according to Section 65 (1) HG may issue and supervise the Master's thesis with the approval of the Joint Examination Board.
- (3) The Master's thesis is issued at the request of the candidate via the chairperson of the Joint Examination Board. Before the Master's thesis is issued, the candidate must have acquired 84 credit points. Proof of fulfilment of these requirements must be attached to the application. The date of issue is to be recorded on file. The candidate may make suggestions in the application regarding the supervisor and the topic. If the candidate waives the right to make suggestions, the chairperson of the Joint Examination Board arranges a topic and a supervisor for the Master's thesis.

- (4) The topic of the Master's thesis can only be returned once and only within two weeks after the date of issue; then the Master's thesis is deemed as not to have been started.
- (5) The processing time for the Master's thesis is six months. The topic and the assignment must be such that the Master's thesis can be completed within this period. Upon justified application by the candidate, the Joint Examination Board may, in agreement with the supervisor, exceptionally grant an extension of up to four weeks. A request for this extension must be submitted to the Joint Examination Board no later than fourteen days prior to the expiry of the processing period. In the case of illness, the deadline for submission can be extended by a maximum of half of the processing time. A medical certificate is required for this purpose. The period of the extension corresponds to the period of illness. If the period of illness exceeds half of the processing time, the candidate will be given a new topic (*optionally: via the Examination Board*) without recognition of an examination attempt.
- (6) The length of the Master's thesis should not exceed 60 pages.
- (7) The Master's thesis must always be written independently as an individual piece of work. However, this does not preclude the topic of the Master's thesis being worked on within a workgroup. In this case, it must be ensured that the contribution of the individual to be assessed as an examination performance is clearly distinguishable and assessable according to objective criteria and fulfils the requirements according to subsection 1. The number of pages specified in subsection 6 must adequately exceed the requirements of an individual thesis.
- (8) When handing in the Master's thesis, the candidate must declare in lieu of oath that he or she has written the thesis independently and has not used any sources or aids other than those indicated, and that he or she has indicated verbatim and analogous quotations. Unpublished contributions must also be included in the list of sources. For the affidavit, a standard form from the Central Examinations Office is to be used and, when submitting the Master's thesis, it is to be signed and included as an integral part of the Master's thesis or, in accordance with the digital submission procedure pursuant to Section 22 (1), uploaded together with the thesis as one file.

## Section 22

### Submission and assessment of Master's thesis

- (1) For the submission of the Master's thesis to be submitted to TUDO, the provisions of the Regulations for the Submission of Theses (Bachelor's/Master's) of TU Dortmund University apply in the currently valid version. If the uploading of individual theses or parts of theses is not suitable for subject-related reasons and/or if there is a contractual agreement with third parties that excludes the publication of theses or parts of theses, the previous analog procedure for the submission of theses according to subsection 2 shall apply by decision of the Examination Board. In the case of the other universities involved in the degree program, deviating regulations may be made.
- (2) In the case of the analog procedure, the Master's thesis must be submitted in due time to the Central Examinations Office of TU Dortmund University in three hardcover copies and additionally in an electronic version that can be used for a software product for plagiarism detection. The date of submission is to be recorded on file. In the case of postal delivery, the date of the postmark shall apply. If the Master's thesis is not handed in in due time, it is assessed as "insufficient" (5.0). In the case of the other universities involved in the degree program, deviating regulations may be made.
- (3) The Master's thesis is to be assessed and evaluated by two examiners. One examiner should be the supervisor of the thesis (first assessor). The second examiner (second assessor) is appointed by the chairperson of the Joint Examination Board.



- (4) The individual assessment is to be carried out in accordance with Section 20 (1) and justified in writing. The grade of the Master's thesis is formed from the arithmetic mean of the two individual grades, provided the difference is not more than 2.0. If the difference is more than 2.0 or if only one examiner assesses the Master's thesis with at least "sufficient" (4.0), the Joint Examination Board shall appoint a third examiner to assess the Master's thesis. In this case, the grade of the Master's thesis is formed from the arithmetic mean of the two better grades. However, the Master's thesis can only be assessed as "sufficient" (4.0) or better if at least two grades are "sufficient" (4.0) or better. Section 20 (7) applies accordingly.
- (5) The candidate must be informed of the assessment of the Master's thesis no later than eight weeks after submission.

### **Section 23** **Additional qualifications**

- (1) The student can take examinations in modules other than those prescribed before passing or definitely failing the degree program. No credit points can be acquired with these examinations.
- (2) Additional qualifications are not included in the determination of the final cumulative grade. The assessment of the examination performance will be included in the Transcript of Records at the request of the student.

### **Section 24** **Master's certificate, documents for a change of university**

- (1) After the assessment of the last examination performance, the candidate receives a certificate stating that he or she has passed the Master's examination. The certificate shall bear the date of the day on which the last examination performance was completed. The overall grade of the Master's examination including the ECTS grade according to Section 20 (10), the topic and grade of the Master's thesis, the modules and module grades as well as the number of credit points acquired in the individual modules are to be listed on the certificate.
- (2) A Diploma Supplement is attached to the certificate. It describes in particular the essential study contents of the degree program, the course of study, the competences acquired with the degree as well as the awarding university. The Diploma Supplement is issued in German and English. Furthermore, an overview of the achieved performances (Transcript of Records) is attached to the certificate.
- (3) At the candidate's request, additional achievements that have not been included in the calculation of the module and overall grade are shown on the Transcript of Records. In addition, voluntary internships completed as part of the degree program, which have been approved on application via the Joint Examination Board and which have a content-related and subject-related connection to the chosen degree program, can also be included.
- (4) At the candidate's request, a certificate of the already achieved examination performances (Transcript of Records) can also be issued before the completion of the Master's examination, containing a list of the successfully completed modules with the credit points and achieved examination performances and the grades in accordance with Section 20 (1).
- (5) The certificate is signed by the chairperson of the Joint Examination Board of TU Dortmund University and bears the seal of the Department of Physics.
- (6) The certificate and the documents are also issued in English.

## **Section 25 Master's Diploma**

- (1) The candidate will be issued a Master's Diploma in German and English with the date of the Master's certificate. The Master's Diploma documents the awarding of the academic degree in accordance with Section 4. The degree program of the graduate is stated in the Master's Diploma.
- (2) The joint Master's Diploma shall be signed by the Dean and the chairperson of the Joint Examination Board of the Department of Physics and by the respective legal representatives of the participating universities and shall bear the seals of the departments involved in the joint degree program.

## **Final provisions**

### **Section 26 Invalidity of examination results and withdrawal of the Master's degree**

- (1) If the candidate has cheated in an examination and this fact only becomes known after the certificate has been issued, the Joint Examination Board can subsequently correct the grades for those examination performances in which the candidate cheated and declare the examination wholly or partially failed.
- (2) If the requirements for admission to an examination were not fulfilled without the candidate's intention to deceive and if this fact only becomes known after the certificate has been issued, this defect is remedied by the passing of the examination. If the candidate has intentionally obtained admission unlawfully, the Joint Examination Board decides on the legal consequences in accordance with the Administrative Procedure Act NRW (*Verwaltungsverfahrensgesetz für das Land Nordrhein-Westfalen, VwVfG NRW*).
- (3) Before a decision is taken pursuant to subsections 1 and 2, the concerned person shall be given the opportunity to make his or her views known orally or in writing.
- (4) In the event of a decision in accordance with subsection 1 or subsection 2 sentence 2, the incorrect examination certificate shall be withdrawn and, if necessary, a new one issued. A decision in accordance with subsection 1 or subsection 2 sentence 2 is excluded after a period of five years after the certificate has been issued.
- (5) The Master's degree is revoked and the Master's Diploma is to be withdrawn if it is subsequently found that it was acquired by deception or if essential requirements for the awarding were erroneously considered to have been met. The Department Council of the Department of Physics decides on the revocation.

### **Section 27 Viewing of examination records**

- (1) After the announcement of the results of a written examination, candidates are granted a viewing of the records of the examination. During this viewing, photocopies or other exact reproductions may be made. The date and place of the viewing shall be fixed by the examiners and announced in an appropriate form on the day of the announcement of the examination results at the latest. The viewing of the further written examination results is granted to the students upon request. The request has to be submitted to the chairperson of the Joint Examination Board within one month.

- (2) Upon request, students are granted access to the examiners' assessments of the according examinations and to the examination protocols of the oral examinations. This request has to be submitted to the chairperson of the Examination Board within three months after the announcement of the examination result. The chairperson of the Joint Examination Board determines the place and time of the viewing.
- (3) At the UCA or the UNIBO, other regulations may apply which deviate from these.

## Section 28 Entry into force and publication

These examination regulations are published in the Official Communications of TU Dortmund University and come into force on the day after their publication.

Issued on the basis of the resolutions of the Department Council of the Department of Physics at TU Dortmund University of xx [month in writing] 2021 and the Rectorate of TU Dortmund University of 17 November 2021, and the institution UNIBO from December 15<sup>th</sup> 2021 and the institution of UCA from December 14<sup>th</sup> 2021.

### Note

Attention is drawn to the fact that, pursuant to Section 12 (5) of the Higher Education Act of the State of North Rhine-Westphalia (*Hochschulgesetz*, HG NRW), a violation of procedural or formal requirements of the university's regulatory or other autonomous law can no longer be asserted after the expiry of one year from the date of this announcement, unless

1. the regulations have not been duly published,
2. the Rectorate has previously objected to the decision of the committee adopting the regulations,
3. the formal or procedural fault has been notified to the university in advance and the violated legal provision and the fact giving rise to the fault have been indicated, or
4. the legal consequence of the exclusion of the right to complain was not pointed out when the regulations were publicly announced.

Dortmund, December 22<sup>nd</sup> 2021.

The President  
of TU Dortmund University  
Professor Dr. Manfred Bayer

**Appendix:** Structure of the Master's degree program “Advanced Methods in Particle Physics”

	Module	Form of course	Type of examination	graded / ungraded	Credit points
1st semester	Quantum field theory	compulsory	Module examination	graded	6
	Experimental particle physics	compulsory	Module examination	graded	9
	Artificial Intelligence for particle physics	compulsory	Module examination	graded	12
2nd semester	Theoretical particle physics	compulsory	Module examination	graded	6
	Experimental aspects of particle physics	compulsory	Module examination	graded	6
	Detector systems in particle and medical physics	compulsory	Module examination	graded	9
	Spring/Summer school	compulsory	Module examination	ungraded	3
3rd semester	Advanced standard model	compulsory	Module examination	graded	6
	Flavour physics	compulsory	Module examination	graded	6
	Computer science for High energy physics	compulsory	Module examination	graded	12
	Research lab	compulsory	Module examination	graded	6
4th sem.	Final examination	compulsory	Module examination	graded	12
Compulsory electives <sup>1</sup>	Guest lectures on basic particle physics	compulsory elective	Module examination	graded	3
	UCA seminar on particle physics	compulsory elective	Module examination	ungraded	3
	Electronics lab course	compulsory elective	Module examination	graded	6
	Modern Particle Physics	compulsory elective	Module examination	graded	6
	Astroparticle Physics	compulsory elective	Module examination	graded	6
	Guest lectures on instrumentation in High-Energy Physics	compulsory elective	Module examination	graded	3/6/9
	TUDO seminar on particle physics	compulsory elective	Module examination	ungraded	3
Compulsory elective Master's thesis <sup>2</sup>	Preparation for the final examination	compulsory elective	Module examination	graded	18
	Preparation abroad for the final examination	compulsory elective	Module examination	graded	18
	Internship in preparation for the final examination	compulsory elective	Module examination	graded	18
	Internship abroad in preparation for the final examination	compulsory elective	Module examination	graded	18

<sup>1</sup>In the compulsory electives, modules with a total of 9 credit points have to be taken. The scope of 9 credit points in the compulsory electives is at the same time the minimum and maximum limit for crediting towards the Master's examination. For the calculation of the module grade or the subject grade, Section 20 (8) and Section 18 (9) apply accordingly. The module descriptions in the module handbook provide further details.

<sup>2</sup> Within the scope of the compulsory elective Master's thesis, the Master's thesis (18 credit points) is completed according to Section 21. Students can choose at which university or institution they would like to complete the Master's thesis. The scope of 18 credit points in the compulsory electives is at the same time the minimum and maximum limit for crediting towards the Master's examination. For the calculation of the module grade or the subject grade, Section 20 (8) and Section 18 (9) apply accordingly. The module descriptions in the module handbook provide further details.