

Examination Regulations

for

Bionics/Biomimetics, M.Sc.

at

Rhine-Waal University of Applied Sciences

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Translator's note: This English translation is offered as a service of Rhine-Waal University of Applied Sciences for information purposes only.

Every effort has been made to render a true and authentic translation. However, only original German-language texts published in the Official Notices of Rhine-Waal University of Applied Sciences are legally binding.

In the event of discrepancy or doubt between the German original and this English translation, the German version takes precedence.

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Section 1 Applicability

These Examination Regulations shall apply to Bionics/Biomimetics M.Sc., offered in English by the Faculty of Technology and Bionics at Rhine-Waal University of Applied Sciences.

Section 2 Aims and objectives; purpose of examinations; master's degree

(1) With due regard to the general study objectives outlined in Section 58 of the Higher Education Act of North Rhine-Westphalia (HG NRW) and on the basis of sound scientific knowledge, this master's degree programme should convey, in particular, application-oriented content and enable students to apply natural scientific and engineering-based methods, to develop practical solutions to problems in their field while taking relevant interdisciplinary approaches into account, and to conduct scientific research. A strong command of the English language is key to achieving success in this degree programme, as it provides the essential basis for this programme's continuous goal of broadening and deepening students' technical language skills.

- (2) Moreover, this master's degree programme aims to produce graduates who:
- are able to grasp the many interrelated concepts within their discipline and chosen field, and are able to link these concepts to knowledge and competencies from other disciplines;
 - are able to undertake scholarly work and employ research methodology at a level which would suffice for a doctoral dissertation;
 - are adept at developing evidence-based solutions for practical, real-world scenarios;
 - can apply theoretical-analytical skills to a range of complex problems;
 - possess the technical know-how and key qualifications necessary for a seamless transition to a professional career.

In addition, the degree programme should both impart and promote intellectual and social competencies. These include, for example, abilities such as:

- the ability to think abstractly, analytically, dialectically and globally;
- the ability to quickly familiarise oneself with new fields, disciplines and areas of responsibility;

and attributes such as:

- self-reliance, creativity and open-mindedness;
- effective communication skills;
- the ability to give and receive constructive criticism.

(3) The master's assessment concludes this programme of study. It serves to assess each student's individual performance and to determine whether he or she has achieved the aforementioned goals.

(4) The academic degree "Master of Science", abbreviated as "M.Sc.", shall be awarded for successfully completing the master's assessment.

Section 3

Entry requirements

- (1) The prerequisites for admission to this master's degree programme are:
1. Proof of a professionally qualifying first degree in a related field, which was earned in a programme of study that consisted of at least 210 total ECTS points or a standard period of study of no less than seven full-time semesters.
 2. A final mark for said first degree of at least "good" (2.5 or better on the German grading scale), or alternatively an "A" or a "B" on the ECTS grading scale.
 3. Proof of sufficient proficiency in the English language, demonstrated by a language certificate of level C1 according to the Common European Framework of Reference for Languages (CEFR).
- (2) Deviating from paragraph (1) no. 1, if an applicant has earned a first degree in a programme that consisted of less than 210, but at least 180 ECTS points, or had a standard period of study of less than seven, but at least six full-time semesters, then said applicant may be admitted to this programme of study on a provisional basis with the stipulation that he or she must successfully complete the missing bachelor-level requirements during his or her master's studies. In this case, the Examination Board and the applicant will conclude a formal learning agreement, which states the scope of the missing ECTS points and specific modules which are to be completed. Admission to the master's thesis is dependent upon the acquisition of a set number of ECTS points (see Section 21 (1) no. 3).
- (3) The Examination Board shall be responsible for deciding whether the prerequisites in paragraph (1) no. 1 have been met based on an applicant's submitted documents and, if necessary, a face-to-face discussion with the applicant. The required subject-relevance of the applicant's undergraduate degree is considered met if the degree was completed in the same field or a field related to this master's degree programme. In all other cases, applicants must demonstrate a sufficient level of technical expertise and competence that is comparable in scope and content to an undergraduate degree as defined in sentence 2. It is then up to the discretion of the Examination Board whether to admit the applicant on an unrestricted basis, on a restricted basis under the condition that missing academic requirements are completed, or to issue a letter of rejection. In the case of admission on a restricted basis, the Examination Board and the applicant will conclude a formal learning agreement which states the scope of the missing ECTS points and specific modules which are to be completed. Learning agreements may require up to 30 missing ECTS points, which must be successfully earned before the registration procedure for the thesis can begin.
- (4) In certain justified cases, applicants may also submit a request for exemption from the English language certificate requirement in paragraph (1) no. 3. Such a request is normally justified when the applicant has completed his or her first professionally qualifying degree in English and in one of the majority English-speaking countries listed in the annex of this document. The Examination Board is responsible for approving or rejecting these requests. If an applicant completed his or her first professionally qualifying degree at Rhine-Waal University of Applied Sciences, then no further proof of English proficiency is required.
- (5) International applicants applying with non-German academic qualifications can be admitted to this degree programme, provided they possess an academic degree that is

demonstrably equivalent to the degree defined in paragraph (1). When assessing the equivalency of academic degrees completed at universities and institutions outside of Germany, deliberations shall take into account the equivalency agreements approved by the Standing Conference of the Ministers of Education and Cultural Affairs in Germany [*Kultusministerkonferenz*] and the German Rectors' Conference [*Hochschulrektorenkonferenz*], as well as any appropriate legal provisions in Germany. In cases of doubt regarding equivalency, the Central Office for Foreign Education [*Zentralstelle für ausländisches Bildungswesen*] shall be heard.

(6) An applicant is ineligible for admission to this programme of study if he or she has failed the final permissible attempt at a mandatory examination in the selected degree programme at a previous university within the territorial jurisdiction of the Basic Law. This provision also applies if the contents of the current degree programme share a significant similarity to the contents of the applicant's previous degree programme. The Chair of the Examination Board is responsible for judging whether this is considered to be the case.

Section 4

Standard period of study; structure of programme; volume of study

(1) The standard period of study, including time for all examinations, is three semesters.

(2) This degree programme is divided into modules. As a rule, a "module" refers to a specific group of thematically related and chronologically coordinated course units that contribute to a uniform education and qualification goal. The master's thesis and colloquium each constitute individual modules. In accordance with the framework outlined in Section 5 (5), the modules in this degree programme comprise a total sum of 90 CP.

(3) Students must define their degree specialisation over the course of their studies. More information can be found in the degree plan located in the annex of these regulations.

(4) The volume of study for this programme comprises a total of 43 semester credit hours, or *Semesterwochenstunden* (SWS).

(5) Additional information about the structure of the programme, as well as about the type, form and scope of modules, can be found in the degree plan in the annex of these examination regulations. For details about a module's qualification aims, content and most commonly offered mode of examination, please refer to the descriptions in the module guide, which is available for viewing in the main faculty office for all students and staff.

Section 5

Structure of the master's assessment; credit points

(1) As specified in the degree plan (see annex), the master's assessment, i.e. the final validation of a student's overall performance, is composed of all course-related examinations and certificates, the thesis and the final oral examination (colloquium).

(2) As specified in the degree plan (see annex), examinations and certificates may cover the content of a module as a whole or of individual courses therein. Assessment shall take place either before or immediately after the conclusion of the corresponding courses, as a

rule in the designated lecture period of the semester in which the aforementioned courses took place.

(3) The progression of study and examination procedures must be planned in such a way that the master's assessment can be completed within the standard period of study.

(4) Examination procedures must allow for the rights granted to students under the German Maternity Leave Act [*Mutterschutzgesetz*], the German Child Benefits and Parental Leave Act [*Gesetz zum Elterngeld und zur Elternzeit*], as well as the right to a leave of absence for providing care to those persons specified in Section 48 (5) sentence 5 HG NRW. In general, if a student requires a change in the timing of examination procedures, he or she must submit a written request to the Examination Board.

(5) The master's assessment is based on a credit point system. All modules and course units are assigned a value in credit points (CP) in accordance with the European Credit Transfer and Accumulation System (ECTS). The number of CP awarded for a module is based on the prescribed workload that is usually needed to complete the individual course units and the module as a whole. As per the ECTS learning agreement, one CP represents a workload for students of approximately 25 to 30 hours. Furthermore, the allocation of CP is based on the assumption that a student's workload for a full year of study is equal to 60 CP in total. Credit points are acquired for a module when a student fulfils the requirements of the respective examination(s) or certificate(s) therein. Earned credit points are recorded in the student's credit point account, which is maintained on his or her behalf by the Examination Board.

Section 6 Examination Board

(1) An Examination Board shall be established for the purpose of organising examinations conducted within its respective faculty and assuming the duties and obligations allocated by these Examination Regulations. The Examination Board is an independent body of Rhine-Waal University of Applied Sciences, as well as a public authority within the meaning of German administrative procedural law. It consists of a Chair, Deputy Chair and six additional members. The Chair, Deputy Chair and two additional members shall be elected by the Faculty Council from among the faculty's professors, one member from the research staff (WiMis), one member from the technical and administrative staff, and two members from the student body. The term in office for full-time employees of the university and their proxies shall be four years; the term in office for student members and their proxies shall be one year. Members may be re-elected.

(2) The Examination Board of the Faculty of Technology and Bionics (hereinafter "Examination Board") is responsible ensuring compliance with these examination regulations within the faculty. It is also responsible for the organisation and proper conduct of examinations. The duties and responsibilities of the dean as outlined in Section 27 (1) HG NRW shall hereby remain unaffected. The Examination Board is responsible, in particular, for ruling on appeals submitted against decisions made during examination procedures. In addition, the Examination Board is responsible for presenting an annual report to the Faculty Council on ongoing trends and developments in examinations and lengths of study. This report shall include corresponding recommendations for reforms or alterations to the

Examination Regulations and degree plans. The Examination Board may delegate its everyday duties and tasks to the Chair, but not in the case of rulings on appeals submitted by students.

(3) The Examination Board shall have a quorum when the Chair or Deputy Chair, one or more additional professor, and at least two additional members with voting power are present at a meeting. Furthermore, at least half of the members with voting power in attendance must be professors. The Examination Board shall pass resolutions with a simple majority. In the event of a tie, the deciding vote shall be cast by the Chair. Non-professors shall not contribute to decisions of a pedagogical-academic or disciplinary nature, in particular decisions relating to the recognition or other assessment of examinations or the appointment of examiners and observers. Furthermore, student members shall not participate in decisions or discussions on issues that relate to their own examinations or to examination questions. In the event of decisions described in Sentence 5, the Examination Board shall have a quorum when the Chair or Deputy Chair and at least two additional professors are present.

(4) Examination Board members have the right to observe examinations within their respective faculty. Student members are prohibited from observing an examination if they are required to sit that same examination within the current examination period.

(5) All members of an Examination Board, their proxies, examiners and observers are subject to strict confidentiality requirements. Those members not employed in public service in Germany shall be sworn to secrecy by the Chair of the Examination Board.

(6) Any detrimental decisions made by the Examination Board or its Chair must be communicated to the affected student without delay. Affected students shall be given the opportunity for a fair hearing before a final decision is made.

Section 7 Examiners and observers

(1) All members of the teaching staff at Rhine-Waal University of Applied Sciences are authorised to act as examiners. In exceptional cases, non-members of the teaching staff may be authorised to act as examiners, provided they have the relevant vocational and occupational experience and this decision is deemed necessary and appropriate for accomplishing the purpose of the examination (as second examiner for the thesis, for example). Examiners must possess at least those qualifications being assessed by the respective examination, or equivalent qualifications; this also applies to any qualified observers present during oral examinations. The Examination Board shall have the final say in this regard. Examiners and observers are appointed by the Examination Board. They shall carry out their duties without regard to any outside instruction.

(2) The Examination Board is responsible for ensuring that testing obligations are distributed as evenly as possible among examiners.

(3) The Chair of the Examination Board shall notify students of the names of the examiners in a timely manner. Students shall be notified ideally upon admission to the examination, but in general no later than two weeks before the scheduled examination date,

or, in the case of the master's thesis, at the latest when the thesis topic is formally issued. Notification by electronic means or public display is sufficient.

Section 8

Credit transfer and recognition of prior learning

(1) Credit for prior examinations completed in degree programmes at state universities or state-recognised universities in Germany, at state vocational academies or state-recognised vocational academies in Germany, at state universities or state-recognised universities elsewhere abroad, or at Rhine-Waal University of Applied Sciences shall be transferred on request, provided the previous examination does not differ significantly in terms of tested knowledge and skills from the examinations being substituted. This shall also apply to previous degrees earned in degree programmes within the meaning of Sentence 1.

(2) Prior periods of study or previous examinations are not considered significantly different if they share, to a large degree, the same learning outcome as their counterparts in this degree programme at Rhine-Waal University of Applied Sciences. Equivalency shall not be established by schematic comparison, but rather by overall consideration and evaluation with regard to the European Transfer and Accumulation System (ECTS) and the knowledge and skills being assessed. This comparison process shall also take into account the equivalency agreements of the Standing Conference of the Ministers of Education and Cultural Affairs and the University Rectors' Conference, as well as relevant agreements with partner universities (if applicable). Where uncertainty remains regarding equivalency, the Central Office for Foreign Education and the International Office may also be consulted.

(3) Skills and qualifications acquired in other contexts can also be credited.

(4) Students are obligated to submit all necessary documentation for credit transfer requests to the Examination Board. Documents must clearly state the completed period(s) of study and the related passed or failed examinations or other coursework, as well as all other skills and qualifications which are to be credited in each case. As a rule, when previous periods of study and credits from university degree programmes are to be credited, students must submit the relevant examination regulations complete with descriptions of the modules, as well as the individual transcript of records or a comparable document.

(5) If a credit transfer request is approved, the marks for the prior learning achievements – in those cases where a mark was awarded and the grading system is comparable – shall also be transferred and included in any relevant mark calculations. If no mark was awarded or the grading system is not comparable, but it is possible to surmise a mark based on specific evidence or indications, then a mark shall be assigned according to the mark scale in Section 10 (3) and the credit transfer process shall proceed according to sentence 1 of this paragraph. If the grading systems are not comparable or there is a lack of evidence pointing to a specific mark, then a passed examination shall be credited without a mark and not included in any grade calculations. If a previously failed examination attempt is credited, it shall be recorded once as “not passed” and Section 10 shall govern subsequent re-examinations. Successful transfer of credits shall also be documented in the final grade certificate (see Section 26 (1)).

(6) Intentionally omitted.

(7) The Examination Board is responsible for all decisions relating to credit transfers. Before decisions are made with regards to equivalency, the responsible subject representatives at the University must be consulted.

Section 9 Placement examination

(1) Applicants who have acquired the skills and knowledge necessary for successful studies, but by means other than a university degree, are eligible to sit a placement examination [*Einstufungsprüfung*] and, depending on the results, to begin their studies in an advanced semester, provided this does not clash with any applicable regulations for the allocation of places at a university in Germany.

(2) Depending on the results of the placement examination, an applicant may be partially or fully exempted from certain course units and their respective examination or certificate requirements. Examinees shall receive written confirmation of the results of their placement examination.

(3) Details concerning the type, form and scope of placement examinations are specified in the Placement Examination Regulations of Rhine-Waal University of Applied Sciences.

Section 10 Evaluation of examinations

(1) Examinations are evaluated and differentiated by marks. Marks are awarded for an examination by the examiner responsible for that particular examination.

(2) If multiple examiners are responsible for a single examination, then they shall evaluate the whole examination together, unless otherwise specified below. Where the individual marks are not identical, the final mark shall be determined by averaging the points of the individual scores.

(3) Examinations shall be marked according to the following scale:

1	= very good	= excellent
2	= good	= well above average
3	= satisfactory	= average
4	= sufficient	= meets all requirements despite shortcomings
5	= failed	= does not meet requirements due to significant shortcomings

Marks can be raised or lowered by 0.3 points, providing an additional degree of assessment between scores; the marks 0.7, 4.3, 4.7 and 5.3 cannot be awarded.

(4) For marks that fall between two whole numbers, the following ranges shall apply:

1.0 – 1.5 = very good

1.6 – 2.5	=	good
2.6 – 3.5	=	satisfactory
3.6 – 4.0	=	sufficient
4.1 – 5.0	=	failed

Only the first decimal place shall be taken into account; all other decimal places are dropped without rounding.

- (5) An examination is passed if a mark of “sufficient” (4.0) or better was awarded.
- (6) The mark for a module consisting of multiple separate examinations shall be calculated by averaging the points earned for the individual examinations. Points shall be weighted by their credit point value.

The mark for a module, which consists of multiple certificates and examinations, shall be calculated by averaging the points earned in the individual examinations once all examination parts have been successfully completed. Points shall be weighted by credit point value. Certificates are pass/fail and without a mark in accordance with Section 19 (3).

(7) Students shall be informed of the results of written examinations, including the thesis, within six weeks of the end of the examination phase or the submission date, respectively. Notification by electronic means or public display is sufficient. Students shall be informed of the results of oral examinations immediately after their conclusion.

(8) The final cumulative grade for the master’s assessment is supplemented by an ECTS grade, providing a relative assessment of academic performance in addition to an absolute assessment. An ECTS grade illustrates a student’s individual performance in relation to the performance of other graduates in the same programme of study. Accordingly, graduates who are among the:

- top 10% of their class will receive the grade: “A”;
- the next 25% will receive the grade: “B”;
- the next 30% will receive the grade: “C”;
- the next 25% will receive the grade: “D”;
- and the final 10% will receive the grade: “E”.

Section 11 Repeating examinations

(1) Failed examinations may be repeated up to two additional times. The thesis and the colloquium may be repeated once each. Previously failed examinations from other degree programmes at Rhine-Waal University of Applied Sciences which closely relate to this degree programme in terms of content (within the meaning of Section 3 (6) Sentence 3) shall count towards a student’s remaining examination attempts.

(2) A passed examination cannot be repeated for a better mark.

- (3) Intentionally omitted.
- (4) Intentionally omitted.
- (5) Intentionally omitted.

Section 12

Withdrawal, examination offences, penalties for violations

(1) An examination shall be evaluated as “failed” (5.0) if a student is registered for an examination but fails to appear without good reason, or if a student withdraws from an examination in-progress without good reason or otherwise does not complete an examination requirement before the deadline. Sentence 1 shall also apply when a student does not submit a master’s thesis or an examination in the form of an assignment, term paper or project before the deadline without good reason.

(2) The Examination Board must be notified immediately and in writing of any mitigating circumstances for missing an examination, withdrawing from an examination or failing to submit an examination before the deadline, and credible evidence must also be provided. If a student claims to be incapable of sitting an examination, the Examination Board reserves the right to request a corresponding medical certificate from a doctor of the board’s choosing. If the Examination Board recognises the mitigating circumstances provided, then the student shall be notified that he or she is permitted to register again for the same examination without penalty.

(3) If a student attempts to cheat or otherwise manipulate the results of an examination through deception, fraud, usage of any non-permissible aids or reference materials, etc., then the examination in question shall be evaluated as “failed” (5.0). A student who disrupts the due and orderly examination process can be excluded from the remainder of that examination, usually after first receiving a warning from the examiner or proctor/invigilator; in this case the excluded student shall be awarded the mark “failed” (5.0) for that examination. The reason(s) for exclusion shall be put on official record. If a student is excluded from an examination, he or she may submit an appeal to the Examination Board. This right also applies to exclusion on the basis of deception, fraud, usage of non-permissible aids or reference materials, etc.

(4) In the case of repeat or otherwise serious examination offences such as fraud or deception, the master’s assessment can be declared to be definitively and irreversibly failed. The Examination Board shall be responsible for this decision. If a master’s assessment is declared to be definitively and irreversibly failed, the affected student shall be automatically deregistered (exmatriculated) from this programme of study.

Section 13

Purpose, scope and types of examinations

(1) The purpose of examinations is to continually assess over the course of the degree programme whether a student has acquired proficiency in the contents and methods of specific subject areas, and can independently and correctly apply the acquired knowledge and skills.

- (2) Examination requirements are based on the contents of the related course unit(s).
- (3) Examinations are generally conducted in the form of written examinations (Section 16), oral examinations (Section 17), or assignments, term papers and projects (Section 18). A combination of these examination types is also possible with the consent of the Examination Board.
- (4) The Examination Board will specify the type of examination – as well as the duration in the case of written examinations – generally before the start of the related course unit, in agreement with the examiner(s) and in a uniform and binding manner for all participating students. In addition, the Examination Board shall be responsible for informing students of this information. Notification by electronic means or public display is sufficient.

Section 14

Entry requirements for examinations

- (1) Students can be admitted to an examination only if they:
1. meet the general prerequisites of study outlined in Section 3; and
 2. are officially enrolled as students or recognized as a visiting student at Rhine-Waal University of Applied Sciences on the date of examination; and
 3. have not passed the examination in question (see Section 11 (2)).
- (2) In general, an application for entry to an examination must be submitted online via the appropriate platform before the deadline set by the Examination Board, or otherwise in writing to the Chair of the Examination Board.
- (3) Intentionally omitted.
- (4) The application must include documents proving that the prerequisites in paragraph (1) have been met, provided that these documents were not submitted previously.
- (5) An application for entry to an examination shall be denied if:
- a) the prerequisites in paragraph (1) have not been met; or
 - b) the application is for 'project B', though 'project A' has not been completed yet; or
 - c) submitted documents were incomplete and missing documents were not submitted before the deadline set by the Examination Board; or
 - d) the student has previously failed the final permissible attempt for a required examination as per the relevant examination regulations in the same programme of study, or the final attempt at an examination that is equivalent to the one specified in the application for entry in a programme of study that is closely related to this master's degree programme content-wise.
- (6) The Chair of the Examination Board, or the Examination Board itself in cases of doubt, shall be responsible for all decisions regarding entry to an examination. Notification by electronic means or public display is sufficient.

(7) A student can submit a request to the Chair of the Examination Board to withdraw from an examination – generally via the appropriate online platform, otherwise in writing – by no later than ten days before the scheduled examination date set by the Examination Board without loss of an examination attempt.

(8) The prerequisites in paragraph (1) shall apply correspondingly to certificates.

Section 15

Conduct of examinations

(1) Dates for examinations shall be set in such a way that they do not require the cancellation of other course units.

(2) Students shall be notified of the date of an examination in a timely manner, generally at least two weeks before the examination phase. In the event that an examination is offered outside of the scheduled examination phase, students shall be notified of the examination date at least two weeks before the examination in question takes place. Notification by electronic means or public display is sufficient.

(3) For identification purposes, students must present their student ID in addition to an officially recognised photo ID (e.g. passport) upon request by the examiner or proctor/invigator.

(4) If a disabled student within the meaning of Section 3 of the Equal Rights for Disabled Persons Act [*Behindertengleichstellungsgesetz*] can demonstrate via medical certificate or by other credible means that he or she is not able to sit the examination in its current form, in part or in full, due to his or her impairment, then the Chair of the Examination Board may permit the student to sit an equivalent examination in a specially arranged form. The Chair of the Examination Board is responsible for ensuring that the testing conditions do not discriminate against disabled students; in cases of uncertainty, the Chair may request further evidence of disability from the student in question. Special examination arrangements for disabled students can include in particular:

- extending the duration of examinations / the time allotted to students;
- providing individual rest periods during a timed examination;
- splitting examinations into smaller parts;
- replacing written examinations with oral examinations, or vice versa;
- permitting and, where applicable, providing additional aids or reference materials, personal assistance, adapted examination documents or separate testing areas.

Section 16

Written examinations

(1) The purpose of a written examination is to assess whether students are able to recognise and solve problems in a particular examination field using commonly employed methods and techniques within a set amount of time and with limited help from aids or reference materials. Written examinations may also be conducted on a computer, subject to

the approval of the Examination Board, provided that the technical conditions ensure compliance with all statutory data privacy and protection requirements.

(2) The time allotted to students for a written examination is based upon the number of semester credit hours [*Semesterwochenstunden/SWS*] for the respective course unit. As a general rule, 60 minutes shall be allotted for every two semester credit hours. The time allotted should generally not exceed two hours.

(3) Written examinations are supervised. The examiner shall decide which aids or reference materials, if any, are permitted during an examination.

(4) As a rule, the examination question for a written examination is set by a single examiner. Where justified by subject matter, particularly when multiple disciplines are covered by a single examination, multiple examiners may set the examination question. In this case, examiners shall first jointly define the weighting of the different parts of the examination question. Weighting is usually determined by the distribution of credit points (CP).

(5) If a student is repeating a previously failed written examination for the final time permitted by German law, then that final attempt shall be evaluated by two examiners. In all other cases, evaluation by a single examiner is sufficient. In those cases described in paragraph (4) sentence 2, each examiner shall evaluate, in general, only their respective part of the examination question; sentence 1 remains unaffected.

Section 17

Oral examinations

(1) Oral examinations shall be conducted before a single examiner in the presence of a qualified observer, or before a panel of examiners as group or individual examinations. In examinations where an observer is present, the observer has a right to be heard before the mark is determined. In examinations before a panel of examiners, the examiners shall jointly evaluate the examination performance.

(2) Oral examinations generally require at least 30, but no more than 45 minutes for each student. In the case of group examinations, the total length can be increased, but should still not exceed 30 minutes per student.

(3) A record shall be kept of the main topics and the results of an oral examination, including, in particular, all facts used to justify the awarded mark.

(4) Students intending to sit the same oral examination at a later date are permitted to attend the examination of others, provided that there is sufficient space available and no objection from the student(s) being tested. By virtue of sentence 1, students are permitted to invite one fellow student to their oral examination. Students registered for the same examination in the same examination phase are not permitted to be present. Additionally, observing students are not permitted to be present during post-examination discussions or when the mark is disclosed.

Section 18

Assignments, term papers, projects

- (1) Examinations in the form of take-home assignments, term papers or projects involve clearly defined tasks that are taken directly from the theory and practice of the subject area being tested. These examinations may also be supplemented with a presentation and/or a question-and-answer discussion at an advanced level. The examination can be conducted as a group examination if each student's individual contribution is recognisable and verifiable to a sufficient degree. The topic and task must be arranged in such a way that it is possible to complete the assignment, term paper or project within the given deadline.
- (2) A maximum of four months' time shall be allotted for an assignment, term paper or project. As a rule, the text portion should be approximately 30 DIN A4 pages in length (not including annexes). The text portion can be supplemented with other media as well, provided they are appropriate and helpful tools for documenting the material in accordance with the assigned task. In this case the text portion may have less pages than the minimum requirement defined in sentence 2.
- (3) The Chair of the Examination Board or the assigning examiner shall notify students of the task, deadline and submission method for the assignment, term paper or project in writing, via public display or by electronic means.
- (4) Section 16 (5) sentences 1 and 2 shall apply accordingly.
- (5) When submitting an assignment, term paper or project, students must also include written and signed confirmation that all work – or, in the case of group work, all of the submitting student's respective and appropriately marked individual contribution – was produced independently and made use of no resources or sources other than those which were clearly stated, with quotations duly marked as such.

Section 19

Certificates

- (1) The purpose of certificates is to attest, in particular, exercises, practical courses and seminars. Certificates are awarded when a student has regularly and actively participated in the respective course unit and can demonstrate that he or she has sufficiently practised the subject-specific methods and is able to apply the imparted knowledge and skills. Certificates are issued by the instructor responsible for the respective course unit.
- (2) Assessment requirements for certificates are not formally regulated. Section 14 of this document shall govern the admission procedure for certificates. Various documents can serve as proof that certificate requirements have been met: protocols from experiments, written analysis of results, calculations, programming exercises, constructions, design concepts and sketches, oral presentations and question-and-answer discussions at an advanced level.
- (3) Certificates are awarded on a pass/fail basis, do not have a mark and may be repeated an unlimited number of times.

Section 20

Master's thesis

(1) The purpose of the master's thesis is to assess whether students, given a limited period of time, can employ scientific and application-oriented methods in order to independently develop a practice-oriented scholarly work in their field of study. At the same time, the master's thesis serves as a way for students to demonstrate that they have systematically and methodically studied the subject area, that they used abstract and analytical thinking above and beyond the isolated case when developing a solution, and that they duly examined both the technical minutiae and the overarching multidisciplinary correlations of the topic. The master's thesis is usually an independent scientific enquiry into the assigned topic, including a comprehensive description and explanation of the generated results.

(2) The thesis topic can be set and supervised by any professor who is authorised to act as an examiner as per Section 7 (1). At the request of the student, the Examination Board can also appoint as a supervisor an honorary professor or a lecturer with relevant experience in the corresponding duties and tasks of a thesis supervisor. The thesis can also be completed at a company or institution outside of the university, provided that a sufficient level of supervision can be assured and subject to the approval of the Examination Board. Students shall be given the opportunity to suggest a subject area for their thesis.

(3) The thesis can also be admitted in the form of group work if each student's individual contribution fulfils the requirements in paragraph (1) and is clearly distinguishable and thus assessable due to clear delimitation by section, page numbers or other criteria which ensure the clear delimitation of parts.

(4) In addition to the text portion, the thesis can be supplemented with other media as well, provided they are appropriate and helpful tools for documenting the work in accordance with the assigned task.

(5) Generally, the text portion of the thesis should be between 80 and 180 DIN A4 pages in length (not including annexes). In addition to the text portion, the thesis can be supplemented with other media as well, provided they are appropriate and helpful tools for documenting the work in accordance with the assigned task. In this case the text portion of the thesis may have less pages than the minimum requirement defined in sentence 1.

Section 21

Entry requirements for the master's thesis

(1) Students are eligible for admission to the master's thesis if they:

1. meet the general prerequisites for study outlined in Section 3, and
2. are officially enrolled as students or recognized as visiting students as per Section 52 (2) HG NRW at Rhine-Waal University of Applied Sciences for the full duration of the master's thesis, and
3. have acquired at least 50 CP, passed both projects, and successfully completed all but two modules in this programme of study.

(2) The Application for Submission of a Master's Thesis must be submitted in writing to the Chair of the Examination Board. Students must include a declaration of any previous

attempts at completing a master's thesis. Furthermore, the application must clearly indicate the name of the examiner who is prepared to set the topic and act as thesis supervisor.

(3) Before an application has been decided upon, students may withdraw their applications via written request without losing an examination attempt.

(4) The Examination Board is responsible for decisions regarding admission to the master's thesis. Applications for admission shall be denied when:

- a) the prerequisites listed in paragraph (1) have not been met; or
- b) documents are missing or incomplete; or
- c) the applicant has previously failed the final permissible attempt for a required examination as per the relevant examination regulations in the same programme of study, or the final permissible attempt at a master's thesis in a related or comparable programme of study at a university that is subject to German Basic Law.

Section 22

Date of assignment and writing the master's thesis

(1) The master's thesis shall be formally assigned by the Chair of the Examination Board, usually via the appropriate online platform. The date of assignment is defined as the day on which the Chair of the Examination Board notifies the student of the topic set by the thesis supervisor; the date of assignment shall be put on official record.

(2) Students are given a period of four months – from the date of assignment to the submission deadline – in order to complete the master's thesis. Students are not permitted to submit their finished thesis within the first eight weeks from the date of assignment. The topic and task of the thesis must be set in such a way that it is possible to complete the thesis before the deadline. In exceptional cases, the Chair of the Examination Board can extend the deadline up to four weeks on the basis of a duly justified request submitted before the original submission deadline. The thesis supervisor is to be heard in connection with this request.

(3) Students may request a new thesis topic one time and without specifying reasons, but only within the first four weeks after the date of assignment. If the requesting student is attempting to pass the master's thesis for a second time, he or she may only request a new topic if this was not done during the first attempt.

(4) In the case of a disabled thesis candidate within the meaning of Section 3 of the Equal Rights for Disabled Persons Act [*Behindertengleichstellungsgesetz*], Section 15 (4) of these regulations shall apply accordingly.

Section 23

Submission and evaluation of the master's thesis

(1) The thesis must be submitted on time, as two hard copies and as an additional digital copy (the entire work as a single PDF or Word document) to the responsible person or office. The date of submission shall be put on official record; if a thesis is submitted via post, the postmarked date shall be recorded as the date of submission. Students must also include a

written and signed confirmation that all work – or, in the case of group work, all of the submitting student's respective and appropriately marked individual contribution – was produced independently and made use of no resources or sources other than those which were clearly stated, with quotations duly marked as such. Generally, the thesis must be written in English, though it can be written in German or another language with the prior consent of the Examination Board.

(2) The master's thesis shall be evaluated by two examiners. One of the examiners shall be the candidate's thesis supervisor. If the thesis supervisor is an honorary professor or a lecturer, then the second examiner must be a professor of the Faculty of Technology and Bionics. If the marks awarded by the examiners are not identical, but the difference is less than 1.5 grade points, then the final mark shall be calculated by averaging the two scores. If the difference in scores is greater than or equal to 1.5, or if one of the marks was 5.0 ("failed"), then a third examiner shall be appointed by the Examination Board to evaluate the thesis. In this case, the final mark shall be calculated by averaging the two best scores. A final mark of "sufficient" (4.0) or better can only be awarded if at least two of the marks are equal to "sufficient" (4.0) or better. All evaluation decisions shall be justified in writing by the examiners.

(3) Twenty-seven CP shall be awarded for passing the thesis.

Section 24 Colloquium

(1) The colloquium (final oral examination) complements the master's thesis, is evaluated separately and should be held within two months of submission of the thesis. Its purpose is to ascertain whether the student can orally express the findings of the thesis and their subject-specific and interdisciplinary correlations, as well as substantiate the findings in an independent manner and assess their wider practical significance. The colloquium should take the form of a discussion with the candidate on the thesis topic. The colloquium is conducted in English, but may be conducted in German or another language with the consent of the Examination Board.

(2) Students are eligible for admission to the colloquium if they:

1. meet the general prerequisites outlined in Section 3, and
2. are officially enrolled as students or recognized as visiting students as per Section 52 (2) HG NRW at Rhine-Waal University of Applied Sciences at the time of the colloquium, and
3. have acquired 87 CP.

(3) The application for admission to the colloquium must be submitted to the Chair of the Examination Board. Students must include a declaration of all previous attempts at completing a post-thesis colloquium. Students may submit an application for admission to the colloquium when they apply for admission to the thesis; in this case, the application shall be approved when the prerequisites in paragraph (2) are met. Additionally, Section 21 (4) shall apply for the approval and rejection of an application for admission to the colloquium.

(4) The colloquium shall be conducted as an oral examination before the examiners of the thesis, who are responsible for evaluating the discussion and assigning a mark. Should the situation outlined in Section 23 (2) sentence 5 occur, then the colloquium shall be conducted before the two examiners whose marks were used to calculate the final averaged mark for the thesis. The colloquium usually lasts for approximately 45 minutes. In all other matters relating to the conduct of the colloquium, the provisions governing the conduct of oral examinations (Section 17) shall apply accordingly.

(5) In the case of disabled students within the meaning of Section 3 of the Equal Rights for Disabled Persons Act [*Behindertengleichstellungsgesetz*], Section 15 (4) of these regulations shall apply accordingly.

(6) Three CP shall be awarded for passing the colloquium.

Section 25

Final results of the master's assessment

(1) The master's assessment is passed when a student successfully earns 90 CP in this degree programme.

(2) The master's assessment is deemed failed when a student's final attempt at passing one of the compulsory examinations, the thesis or the colloquium is evaluated as definitively and irreversibly "failed" (5.0). In this case, the candidate shall receive a written declaration informing him/her of the failed master's assessment or the irretrievable loss of the right to sit examinations as per Section 11 (1), as well as providing an explanation of available legal recourse. On written request, the Chair of the Examination Board can issue a certificate listing all passed examinations and their final marks as well as the remaining examinations still needed to pass the master's assessment. This certificate must clearly show that the deregistered (exmatriculated) student has definitively and irreversibly failed the master's assessment or lost his or her right to sit examinations as per Section 11 (1).

Section 26

Final grade certificate, final mark, diploma supplement

(1) Students shall be promptly issued a final grade certificate [*Abschlusszeugnis*] upon passing the master's assessment, where possible within four weeks after the colloquium. The final grade certificate shall contain a full list of completed modules and awarded marks; the topic, mark and names of examiners for the thesis; the mark for the colloquium; and the overall final mark for the master's assessment. If credits were transferred from a different institution as per Section 8, then their origin shall also be noted.

(2) The overall final mark for the master's assessment shall be equal to the weighted average of the individual marks listed in paragraph (1) sentence 2 and in accordance with the grading scale defined in Section 10 (4). The weighting of marks is based on the distribution of credit points in the degree plan. The marks are weighted as follows:

- Average of marks earned in modules containing individual course units, with each mark weighted by the CP value of its module: = 67%
- Mark for the thesis: = 30%

– Mark for the colloquium: = 3%

(3) The final grade certificate shall be signed by the Chair of the Examination Board and affixed with the official seal of Rhine-Waal University of Applied Sciences. In addition, it shall indicate the date on which the colloquium took place.

(4) In addition to the final grade certificate, each graduate shall receive an official Diploma Supplement and a transcript of records, both issued in English. The Diploma Supplement shall be affixed with the official seal of Rhine-Waal University of Applied Sciences.

(5) A student who voluntarily withdraws from the university before successfully completing the master's assessment may apply for a premature leaving certificate [*Abgangszeugnis*], which lists all of the examinations completed during the programme of study. Paragraph (3) sentence 1 shall apply accordingly.

Section 27

Master's degree certificate

(1) A master's degree certificate shall be issued to students at same time as the final grade certificate and bearing the same date of issue. The master's degree certificate is an official confirmation that the master's degree specified in Section 2 (4) was conferred.

(2) The master's degree certificate shall be signed by the Dean of the Faculty of Technology and Bionics and by the Chair of the Examination Board, and affixed with the official seal of Rhine-Waal University of Applied Sciences.

Section 28

Additional examinations

(1) Students may also sit examinations in modules and course units which are not compulsory for their degree programme. Upon request the results of these examinations can be listed on the final grade certificate or the premature leaving certificate, but will not be incorporated into the final mark calculation.

(2) This shall also apply accordingly to modules completed as per the learning agreement described in Section 3 (2) of these regulations.

Section 29

Viewing examination records

(1) Following the conclusion of examinations in their degree programme, students may request the opportunity to view marked written examinations, the examiners' corresponding evaluation sheets, and the minutes of the examinations.

(2) Students must submit a request to view examination records to the Chair of the Examination Board within one month from the date of issue of the final grade certificate, premature leaving certificate or declaration of a failed master's assessment. Section 32 of the Administrative Procedure Act of North Rhine-Westphalia [*Verwaltungsverfahrensgesetz*

NRW] shall govern students' right to submit a request after expiry of this deadline. The Chair of the Examination Board shall set the time and place for viewing.

(3) Students may request an opportunity to view marked examinations after the examination in question has been evaluated. Requests must be submitted within one month after publication of the examination results. Paragraph (2) shall apply accordingly.

Section 30 **Nullification of examinations**

(1) If a student has cheated on one or more examination and this becomes known only after the student has been issued a final grade certificate, a premature leaving certificate or a certificate as specified in Section 25 (2) sentence 3, then the Examination Board reserves the right to retroactively nullify the marks for the affected examinations and to declare the master's assessment, in part or in whole, as "failed".

(2) If the prerequisites for entry to an examination were not met and it can be shown that this was not the result of deliberate deception by the student and this inconsistency becomes known only after the student has been issued a final grade certificate, a premature leaving certificate or a certificate as described in Section 25 (2) sentence 3, then this error shall be remedied by the fact that the examination was passed. If the student used deliberate deception to gain wrongful entry to the examination, then the Examination Board shall decide upon any subsequent legal action, taking into account the North Rhine-Westphalian Administrative Procedure Act [*Verwaltungsverfahrensgesetz NRW*].

(3) The consequently incorrect final grade certificate, leaving certificate, master's degree certificate or certificate described in Section 25 (2) sentence 3 shall be revoked and, where appropriate, reissued to the holder. The statute of limitations for decisions with regard to paragraph (1) and paragraph (2) sentence 2 is five years after the date of issue for a final grade certificate, premature leaving certificate or certificate as described in Section 25 (2) sentence 3.

Section 31 **Entry into force**

(1) These Examination Regulations shall enter into force on the day after their publication in the Official Notices of Rhine-Waal University of Applied Sciences. They shall apply for students were enrolled in Bionics/Biomimetics M.Sc. for the first time in or after summer semester 2016.

(2) Students who were initially enrolled in Bionics/Biomimetics M.Sc. before summer semester 2016 are entitled to continue their studies under the previous examination regulations (dated 29 October 2015, published in Official Notices 26/2015) until 28 February 2018 at the latest.

(3) Currently enrolled students who are studying according to the previous examination regulations dated 29 October 2015 can submit a written request to the Examination Office to switch to these examination regulations for the remainder of their studies. The Faculty Examination Board has final say regarding credit transfers for previously completed modules.

Note: These revised examination regulations entered into force on 26 October 2018.

Annex: Relevant undergraduate degrees

Degrees in the following fields are considered to be relevant to Bionics/Biomimetics M.Sc. for admission-related purposes:

- Bionics
- Mechanical Engineering
- Aeronautical and Aerospace Engineering
- Materials Engineering
- Mechatronics / Robotics
- Electronics / Electrical Engineering
- Industrial Engineering
- Architecture / Construction Engineering
- Biology / Zoology / Botany
- Oceanography / Ecology
- Physics / Chemistry
- Mathematics / Computer Science

Annex: Countries defined as “English-speaking” for admission-related purposes:

- Antigua and Barbuda
- Australia
- The Bahamas
- Barbados
- Belize
- Canada
- Dominica
- Grenada
- Guyana
- Ireland
- Jamaica
- New Zealand
- St Kitts and Nevis
- St Lucia
- St Vincent and the Grenadines
- Trinidad and Tobago
- The United Kingdom
- United States of America

Curriculum for Bionics/Biomimetics M.Sc.

Annex: Degree Plan for Bionics/Biomimetics M.Sc.

This degree programme includes specialisation paths containing specific module blocks and electives. Students must select two from a total of four available module blocks and successfully complete all of the modules therein. 15 CP are awarded for successfully completing a module block. Students may choose from these blocks:

- Locomotion
- Sensing
- Biomaterials
- Behaviour

These module blocks are accompanied by an elective catalogue. Students must earn at least 15 CP from electives within this catalogue or from modules in the remaining two unselected module blocks above.

A final block consists of two projects and a module. 15 CP are awarded for successfully completing this block.

The master's assessment concludes with the thesis (27 CP) and the colloquium (3 CP).

(See attachment.)

Abkürzungen, abbreviations:

Ex = *type of examination, Art der Prüfung*

CH = *credit hours per week, Semesterwochenstunden*

WS = *Wintersemester, winter term*

SS = *Sommersemester, summer term*

CP = *credit points (= ECTS-points)*

V/L = *Vorlesung, lecture*

S = *Seminar*

Ü/ E = *Übung, exercise*

Pra/PT = *Praktikum, practical course*

Pro = *Projekt, project*

P = *Prüfung, examination*

T = *Testat, certificate*

Degree Plan for Bionics/Biomimetics M.Sc.

Version dated 10 February 2016

Block A Bionics of Locomotion												
Code No	Module / Subjects	C H	Type					E x	C P	Mod CP	WS	S S
			V	S L	Ü	Pra	Pro					
M_BB_101	Bionics of Locomotion and Control	5								5		
M_BB_101.1	Bionics of Locomotion and Control		2			1		P	3		3	
M_BB_101.2	Case studies of biomimetic implementations			2				T	2		2	
M_BB_102	Energy and Environment	3						P		5		
M_BB_102.1	Energy in biol and tech systems		1			1			3		2	
M_BB_102.2	Life in moving fluids		1						2		1	
M_BB_103	Mechanics and Control	3						P		5		
M_BB_103.1	Mechanics and control		1			1			3		2	
M_BB_103.2	Locomotion in animals and technology		1						2		1	
Sum		11								15	11	

Block C Bionics of Materials and Structures												
Code No	Module / Subjects	C H	Type					E x	C P	Mod CP	WS	S S
			V	S L	Ü	Pra	Pro					
M_BB_106	Bionics of Materials and Structures	5								5		
M_BB_106.1	Structural biomaterials		2			1		P	3		3	
M_BB_106.2	Case studies of bionic implementations			2				T	2		2	
M_BB_107	Materials and Structures	3						P		5		
M_BB_107.1	Advanced Materials Science		1		1				3		2	
M_BB_107.2	Materials in Design		1						2		1	
M_BB_108	Joining Materials	3						P		5		
M_BB_108.1	Joining Technology		1			1			3		2	
M_BB_108.2	Biojoining and bioinspired materials		1						2		1	
Sum		11								15	11	

Block B Bionics of Sensing												
Code No	Module / Subjects	C H	Type					E x	C P	Mod CP	WS	S S
			V	S L	Ü	Pra	Pro					
M_BB_109	Bionics of Sensing	5								5		
M_BB_109.1	Bionics of sensing		2			1		P	3			3
M_BB_109.2	Advanced studies in biomimetics			2				T	2			2
M_BB_110	Sensors	3						P		5		
M_BB_110.1	Biomimetic sensors		1			1			3			2
M_BB_110.2	Ambient intelligent systems		1						2			1
M_BB_111	Sensor Fusion	3						P		5		
M_BB_111.1	Statistical sensor fusion		1						2			1
M_BB_111.2	Brain-computer interfaces		1			1			3			2
Sum		11								15		11

Block D Bionics of Behaviour and Sociology												
Code No	Module / Subjects	C H	Type					E x	C P	Mod CP	WS	S S
			V	S L	Ü	Pra	Pro					
M_BB_113	Bionics of Behaviour & Sociology	5								5		
M_BB_113.1	Bionics of behaviour and sociology		2			1		P	3			3
M_BB_113.2	Advanced studies in biomimetics			2				T	2			2
M_BB_124	Behaviour and Evolution	3						P		5		
M_BB_124.1	Emergent Effects		1						2			1
M_BB_124.2	Evolutionary algorithms		1			1			3			2
M_BB_115	Systems and Organisation	3						P		5		

M_BB_115.1	Self-organisation		1							2			1
M_BB_115.2	Social systems		1			1				3			2
Sum		11									15		11
Block E Electives													
Code No	Module / Subjects	C H	Type						E x P	Mod CP	WS	S S	
			V	S	Ü	Pra	Pro						
M_BB_121	Computation and Modelling	3							P	5			
M_BB_121.1	Modelling and simulation		1		1						2		
M_BB_121.2	Artificial intelligence		1								1		
M_BB_122	Materials Applications	3							P	5			
M_BB_122.1	Biomedical applications of materials		1								1		
M_BB_122.2	Simulating biomaterials		1		1						2		
M_BB_123	Materials and Function	3							P	5			
M_BB_123.1	Finite element modelling		1		1							2	
M_BB_123.2	Intelligent materials		1									1	
M_BB_114	Business Biomimetics	3							P	5			
M_BB_114.1	Bionics for business processes		1									1	
M_BB_114.2	Bionics in design and production		1		1							2	
M_BB_125	Communication and Information	3							P	5			
M_BB_125.1	Biomimetic communication		1			1						2	
M_BB_125.2	Ontology in biomimetics		1									1	
M_BB_126	Introduction to Small Scale Bionics	3							P	5			
M_BB_126.1	Microbiomimetics & Microscopy		1			1						2	
M_BB_126.2	Theory & Practice of High Resolution Microscopy					1						1	
M_BB_127	Any combination of modules from the HSRW Masters degree programmes*	9								15	6	9	

Block R&D Research and Development													
Code No	Module / Subjects	CH	Type						Ex	CP	Mod CP	WS	SS
			V	SL	Ü	Pra	Pro						
M_BB_104	Development and Management	3									5		
M_BB_104.1	Mythbusters in bionics		1						T	1		1	
M_BB_104.2	Biomimetic product design		1						T	2		1	
M_BB_104.3	Patenting & technology transfer		1						T	2		1	
M_BB_105	Applied Research Project A	5									5		
M_BB_105.1	Scientific methods and writing		1						T	1		1	
M_BB_105.2	Applied research project A						4		P	4		4	
M_BB_112	Applied Research Project B	5									5		
M_BB_112.2	Science and project management		1						T	1			1
M_BB_112.2	Applied research project B						4		P	4			4
Sum		13									15	8	5

Block Thesis													
Code No	Module / Subjects	C H	Type						E x	Mod CP	WS	S S	
			V	S	Ü	Pra	Pro						
M_BB_116	Master's Thesis									27			
M_BB_117	Colloquium									3			
										30			

Block A Bionics of Locomotion													
Code No	Module / Subjects	CH	Type						Ex	CP	Mod CP	WS	SS
			V	S	Ü	Pra	Pro						
M_BB_101	Bionics of Locomotion and Control	5								5			
M_BB_101.1	Bionics of locomotion and control		2			1		P	3		3		
M_BB_101.2	Case studies of biomimetic implementations			2				T	2		2		
M_BB_102	Energy and Environment	3						P		5			
M_BB_102.1	Energy in biological and tech systems		1			1					3	2	
M_BB_102.2	Life in moving fluids		1								2	1	
M_BB_103	Mechanics and Control	3						P		5			
M_BB_103.1	Mechanics and control		1								2	1	
M_BB_103.2	Locomotion in animals and technology		1			1					3	2	
Sum		11								15	11		

Block C Bionics of Materials and Structures													
Code No	Module / Subjects	CH	Type						Ex	CP	Mod CP	WS	SS
			V	SL	Ü	Pra	Pro						
M_BB_106	Bionics of Materials and Structures	5								5			
M_BB_106.1	Structural biomaterials		2			1		P	3		3		
M_BB_106.2	Case studies of bionic implementations			2				T	2		2		
M_BB_107	Materials and Structures	3						P		5			
M_BB_107.1	Advanced materials science		1			1					3	2	
M_BB_107.2	Materials in design		1								2	1	
M_BB_108	Joining Materials	3						P		5			
M_BB_108.1	Joining technologies		1			1					3	2	
M_BB_108.2	Biojoining and bioinspired materials		1								2	1	
Sum		11								15	11		

Block B Bionics of Sensing													
Code No	Module / Subjects	CH	Type						Ex	CP	Mod CP	WS	SS
			V	SL	Ü	Pra	Pro						
M_BB_109	Bionics of Sensing	5								5			
M_BB_109.1	Bionics of sensing		2			1		P	3		3		
M_BB_109.2	Advanced studies in biomimetics			2				T	2		2		
M_BB_110	Sensors	3						P		5			
M_BB_110.1	Biomimetic sensors		1			1					3	2	
M_BB_110.2	Ambient intelligent systems		1								2	1	
M_BB_111	Sensor Fusion	3						P		5			
M_BB_111.1	Statistical sensor fusion		1								2	1	
M_BB_111.2	Brain-computer interfaces		1			1					3	2	
Sum		11								15		11	

Block D Bionics of Behaviour and Sociology													
Code No	Module / Subjects	CH	Type						Ex	CP	Mod CP	WS	SS
			V	SL	Ü	Pra	Pro						
M_BB_113	Bionics of Behaviour & Sociology	5								5			
M_BB_113.1	Bionics of behaviour and sociology		2			1		P	3		3		
M_BB_113.2	Advanced studies in biomimetics			2				T	2		2		
M_BB_114	Business Biomimetics	3						P		5			
M_BB_114.1	Bionics for business processes		1								2	1	
M_BB_114.2	Bionics in design and production		1			1					3	2	
M_BB_115	Systems and Organisation	3						P		5			
M_BB_115.1	Self-organisation		1								2	1	
M_BB_115.2	Social systems		1			1					3	2	
Sum		11								15		11	

Block E Electives

Code No	Module / Subjects	CH	Type						Mod CP	WS	SS
			V	S	Ü	Pra	Pro	Ex			
M_BB_121	Computation and Modelling	3						P	5		
M_BB_121.1	Modelling and simulation		1		1					2	
M_BB_121.2	Artificial intelligence		1							1	
M_BB_122	Materials Applications	3						P	5		
M_BB_122.1	Biomedical applications of materials		1							1	
M_BB_122.2	Simulating biomaterials		1		1					2	
M_BB_123	Materials and Function	3						P	5		
M_BB_123.1	Finite element modelling		1		1						2
M_BB_123.2	Intelligent materials		1								1
M_BB_124	Behaviour and Evolution	3						P	5		
M_BB_124.1	Emergent effects		1								1
M_BB_124.2	Evolutionary algorithms		1		1						2
M_BB_125	Communication and Information	3						P	5		
M_BB_125.1	Biomimetic communication		1			1					2
M_BB_125.2	Ontology in biomimetics		1								1
M_BB_127	Any combination of modules from other HSRW Master's degree programmes*	9							15	6	9

Block R&D Research and Development												
Code No	Module / Subjects	CH	Type						Mod CP	WS	SS	
			V	SL	Ü	Pra	Pro	Ex				CP
M_BB_104	Development and Management	3								5		
M_BB_104.1	Mythbusters in bionics		1					T	1		1	
M_BB_104.2	Biomimetic product design		1					T	2		1	
M_BB_104.3	Patenting & technology transfer		1					T	2		1	
M_BB_105	Applied Research Project A	5								5		
M_BB_105.1	Scientific methods and writing		1					T	1		1	
M_BB_105.2	Applied research project A					4		T	4		4	
M_BB_112	Applied Research Project B	5								5		
M_BB_112.2	Science and project management		1					T	1			1
M_BB_112.2	Applied research project B					4		T	4			4
		13								15	8	5

Block Thesis												
Code No	Module / Subjects	CH	Type						Mod CP	WS	SS	
			V	S	Ü	Pra	Pro	Ex				
M_BB_116	Master's Thesis									27		
M_BB_117	Colloquium									3		
										30		

* Im Wahlpflichtbereich können mit Zustimmung des Prüfungsausschusses maximal 15 CP aus dem Masterstudienangebot der Hochschule Rhein-Waal belegt werden. // * As elective subjects, a maximum of 15 CP can be chosen with the consent of the Examination Board from the degree plan of any master's degree programme at Rhine-Waal University of Applied Sciences.

** Die Fakultät behält sich das Recht vor eine Mindestteilnehmerzahl für das Zustandekommen eines Wahlpflichtkurses festzulegen. Die Möglichkeit des Erreichens der vorgeschlagenen Kreditpunktzahl aus dem Wahlpflichtbereich bleibt unberührt. // ** The Faculty reserves the right to determine a minimum number of participants for offering an elective subject. The possibility of obtaining the required number of credit points remains unaffected.

*** Die Fakultät behält sich vor, das Wahlpflichtangebot im Laufe der Zeit bei neuen Entwicklungen in verschiedenen Feldern der Bionik durch weitere Fächer zu erweitern. // *** The Faculty reserves the right to offer additional elective subjects in the future to accommodate new developments in the various fields of Bionics.