Heidelberg University and Heilbronn University Examination Rules and Regulations for the Bachelor's Degree Programme in Medical Informatics

dated 23 May 2016

On the basis of § 32 of the State Law of Baden-Württemberg on Higher Education (Landeshochschulgesetz, LHG), last amended by the law on equal opportunities for men and women in public service in Baden-Württemberg and the amendment to the LHG dated 23 February 2016 (GBl. dated 26 February 2016, p. 108), the Senate of Heidelberg University and the Senate of Heilbronn University issued the following examination rules and regulations for the Bachelor's degree programme in Medical Informatics on 19 April 2016 and 13 April 2016 respectively.
These examination rules and regulations were approved by the President of Heidelberg University and the President of Heilbronn University on 23 May 2016.

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Section I: General provisions

§ 1   Purpose of the academic programme and examination

(1)   The Bachelor's degree programme in Medical Informatics focuses on the selection and application of systems, methods, and tools to process information in the health care system. The aim of the programme is to prepare students for a career in health care or in the wider economy. It conveys the principles of Medical Informatics, and equips graduates with a vocational qualification that opens up a variety of career options to them. The IT skills taught during the programme are particularly comprehensive, meaning that graduates are competent even to pursue careers outside of the health care system.

    The Bachelor's degree programme enables students to gain an undergraduate degree, which qualifies them to enter a profession and equips them with the skills required to solve problems independently.

(2)   The purpose of the Bachelor's examination is to assess whether students have mastered the fundamentals of Medical Informatics, have an overview of the interconnections between the individual disciplines they have studied, and have acquired the basic methodological and practical skills required to enter a profession.

(3)   The admission requirements for the academic programme are subject to separate admission regulations.

§ 2   Bachelor's degree

Upon successful completion of the Bachelor's examination, Heidelberg University will confer the academic degree, "Bachelor of Science" (abbreviated to B.Sc.).

§ 3   Standard period of study, programme structure, range of courses offered and part-time study

(1)   The standard period of study for the Bachelor's degree programme is six semesters, including examinations. Successful completion of the Bachelor's degree programme requires a total of 180 credits (ECTS), obtained through both compulsory and elective courses.

(2) The Bachelor's programme is modular, and consists of subject-specific modules (148 credits), modules in cross-disciplinary skills (20 credits), and the Bachelor's thesis (12 credits). The required modules and the corresponding courses and lectures are listed in Appendix 1.

(3) An orientation examination must be taken no later than at the end of the second semester. This examination is taken as an integrated part of the course of study, and consists of successful participation in the course entitled "Fundamentals of Practical Informatics 1". Successful participation requires that students sit a written examination, which must be graded as "sufficient" (4.0) or better.

(4) If the orientation examination is failed, it is possible to retake it once during the following semester. If the orientation examination has not been passed by the end of the third semester, the student is not entitled to take the final examinations, unless they are not responsible for this deadline being exceeded.

(5) The orientation examination is a preliminary part of the Bachelor's examination.

(6) Generally, the language of instruction and examination is German. Lectures and courses may also be held in English.

(7) Part-time study as defined in the Charter on part-time study at Heilbronn University, or in the Regulations on part-time study at Heidelberg University, is not possible for this programme.

§ 4   Modules, credits and transcripts of grades

(1) A module is a teaching unit, self-contained in terms of both time and content, and comprised of various lectures and courses. Modules consist not only of lectures and courses, but also of the examination prerequisites necessary for the completion of the module.

(2) The Bachelor's thesis is regarded as an individual module. Courses in cross-disciplinary skills may be partially or fully integrated into subject-specific modules.

(3) A distinction is made between:
- compulsory modules: to be completed by all students.
- compulsory elective modules: to be selected by the student from a limited subject area.

(4) In order to pass a module, all of its components must be graded "sufficient" (4.0) or better (sub-module grades).

(5) Credits are awarded for successfully completed modules, including their individual components. One credit corresponds to a workload of 30 hours.

(6) A transcript of records will be issued at the end of each semester, listing all module and sub-module examinations students have passed, including the corresponding credits and grades.

§ 5   Examinations board

(1)   An examinations board consisting of six members will be established. It will be responsible for the organisation of examinations and the execution of the tasks defined in these examination rules and regulations. Five of its members must be professors. The sixth member will be a student with advisory authority. The professors are appointed for a three-year term, the student member for a one-year term. An examination office based at Heilbronn University will support the examinations board in the completion of its tasks. The Medical Faculty Heidelberg, will appoint the chair of the examinations board and two of its members. The Faculty of Computer Science at Heilbronn University will appoint the deputy chair of the examinations board, and one further member. The deputy chair is the acting chairperson of the examinations board. If a member leaves the examinations board before their term is over, a new member is appointed for the remaining period.

(2)   The examinations board ensures that the examination rules and regulations are upheld and provides recommendations for further improving the curriculum and the examination rules and regulations. It appoints the examiners and observers involved in examinations. The examinations board may confer responsibility for appointing examiners and observers on its acting chairperson. The board may be called upon for all questions regarding examinations.

(3)   The acting chairperson manages the business of the examinations board, and prepares its meetings. The chairperson chairs the meetings and has the deciding vote in the event of a tie vote.

(4)   The examinations board may confer further tasks on its acting chairperson, provided this does not violate applicable law. Such a decision may be revoked at any time. The examinations board must be informed on a regular basis about the execution of these tasks.

(5)   Members of the examinations board have the right to attend examinations.

(6)   Members of the examinations board, examiners, and observers are obliged to maintain professional confidentiality. Members who are not civil servants are sworn to secrecy by the chairperson.

(7)   The candidate must be informed of negative decisions taken by the examinations board immediately and in writing; the reasons for the decision must be stipulated and information on the procedure for appeal must be provided.

§ 6   Examiners and observers

(1)   Generally, examinations, which are not completed during the course of study as part of individual courses or lectures, may only be carried out by professors, associate professors, or research associates who have been granted the right to conduct examinations. Research assistants, research associates, adjunct lecturers and lecturers

with special responsibilities may only be appointed to conduct examinations under exceptional circumstances; when there are not enough faculty members available, who are authorised to conduct examinations.

(2)   Examinations held as an integrated part of a course or lecture during the course of study are usually conducted by the teacher of the course in question.

(3)   Observers must have sat the corresponding Bachelor's examination or equivalent.

(4)   Candidates can propose an examiner for their Bachelor's thesis; however, this does not constitute a legal entitlement to be examined by a certain examiner.

(5)   The acting chair of the examinations board ensures that candidates are notified of examiners' names in due time.

§ 7   Recognition of course credits, examination results and academic degrees

(1)   Course credits and examination results as well as academic degrees that were obtained through a degree programme at another state or state-recognised higher education institution or college of cooperative education (Berufsakademie) in the Federal Republic of Germany, or through degree programmes at state or state-recognised higher education institutions abroad, will be recognised as long as the skills acquired do not differ significantly from those required for the courses and examinations or the degrees that are replaced. This recognition is required in order to continue an academic programme, take examinations, start a further academic programme or be admitted to a doctoral programme.

(2)   Preliminary and intermediate examinations taken at other German universities in the same degree programme or in a similar degree programme will be recognised. Courses completed at recognised distance-learning institutions will be considered equivalent to those in a corresponding traditional degree programme with regard to determining the duration of study.

(3)   It is the applicant's responsibility to provide all information necessary for credits to be recognised. The office conducting the recognition procedure is responsible for proving that an application does not fulfil the requirements.

(4)   If agreements existing between the Federal Republic of Germany and other states concerning the equivalence of university degree programmes (Equivalency Agreements) diverge from paragraph 1 and § 35, paragraph 3, clause 5 of the LHG (Act on Higher Education of the Land of Baden-Württemberg), and thereby favour students from other states, the rules and regulations in the Equivalency Agreement shall take precedence.

(5)   Examination results are to be graded on the basis of a credit system that allows credits from equivalent or similar degree programmes studied at the same or at a different university to be recognised; this also applies to universities of cooperative education, provided that equivalence is established.

(6)   Knowledge and skills acquired outside of the higher education system are to be recognised for a degree programme at a higher education institution if:
1.   the requirements for university admission are fulfilled at the time of recognition,
2.   the knowledge and skills to be recognised for the university degree programme are equivalent in both content and level to the course credits and examinations which they are to replace, and
3.   the criteria for recognition have been verified in an accreditation.
Knowledge and skills gained outside of the higher education system may not replace more than 50% of the university degree programme. A placement test in line with paragraph 8 will determine the extent to which course credits and examination results are recognised.

(7)   Credits may be awarded for study and examination components completed in the context of refresher courses (Kontaktstudien). When recognising credits from refresher courses for a university degree programme, paragraphs 2 and 5, as well as paragraph 6, clause 1, item 1, apply accordingly. When recognising knowledge and skills gained outside of the higher education system for refresher courses, paragraph 6 applies accordingly.

(8)   If an application for recognition of periods of study, course credits and examinations as defined in paragraph 6 has not been assessed in line with paragraph 5, a placement test, usually in the form of an oral examination, will take place. § 6, § 8, § 10 and § 12 shall apply to this test accordingly.

(9)   Students are to submit their application for recognition of periods of study, course credits, and examinations to the examinations board. The board will subsequently decide whether to approve the application. If it is rejected, the board must inform the student of the reasons for this rejection in writing. In such cases, the student may raise an objection with the examinations board.

§ 8   Unexcused absence, withdrawal, deception and breaches of regulations

(1)   The student must register to sit examinations.

(2)   An examination is graded as "failed" (5.0), if a candidate fails to attend the examination and is unable to provide a valid reason for his or her absence, or if the candidate withdraws after the examination has started. The same applies if a written examination is not completed within the specified time frame, unless the candidate is not responsible for exceeding the time limit.

(3)   The candidate can withdraw from an examination up to three days before it takes place. If the candidate withdraws from an examination less than three days before it takes place, the reasons for this withdrawal must be plausible, and must be immediately submitted in writing to the examinations board. It is not possible to withdraw from an examination once it has started. If a child for whom the candidate is generally the sole carer, is ill, a medical certificate must be provided. In the event of doubt, Heidelberg University or Heilbronn University can request a medical certificate from a designated doctor.

(4)   When deciding whether the candidate is responsible for exceeding a deadline for

registering for or taking an examination, the examinations board must respect the provisions stated in the Maternity Protection Act (Mutterschutzgesetz) and the legal regulations concerning parental leave, and allow candidates to make appropriate use of these provisions. The same applies for students with disabilities or chronic illnesses, or for students with dependent relatives, in accordance with § 7 paragraph 3 of the Home Care Leave Act (Pflegezeitgesetz).

(5) If the candidate tries to influence the examination results through deception or by using unauthorised aids, the examination components concerned will be graded as "failed" (5.0). If the candidate disrupts the proper course of the examination, they may be excluded from continuing the examination by the examiner or examination supervisor, in which case the examination will be graded as "failed" (5.0). In extreme cases, the examinations board may exclude the candidate from all further examinations.

(6) The candidate has a period of seven days during which he or she may request that the examinations board review the decision in accordance with paragraph 5, clauses 1 and 2. The candidate must be informed of negative decisions immediately and in writing; the reasons for the decision must be stipulated and information on the procedure for appeal must be provided.

§ 9   Types of examination component completed during the course of study

(1) Examination components completed during the course of study include:
1. oral examinations
2. written examinations (electronically where applicable).

(2) If the candidate provides a medical certificate that plausibly proves that they are not able to take examinations in the form prescribed, whether completely or partially, due to permanent or chronic health problems, the examinations board may allow them to take an equivalent examination in an alternative form. The same applies for other course requirements.

§ 10   Oral examination components completed during the course of study

(1) In oral examination components, candidates are required to demonstrate that they are able to identify interconnections within the examined subject matter, and that they are able to relate specific problems to these interconnections. In addition, candidates should demonstrate that they have acquired adequate fundamental knowledge relating to their academic programme.

(2) An oral examination has a duration of between 15 and 45 minutes.

§ 11   Written examination components completed during the course of study

(1) In written examination components, candidates should demonstrate that they are able to recognise problems relating to their subject and find solutions for them using subject-specific methods, within a limited period of time and using limited resources.

(2)   A written examination has a duration of between 60 and 180 minutes. Multiple choice questions are permitted.

(3)   They are generally set by the lecturer responsible for a lecture or course, as determined by the examinations board. The examination questions must correspond to the knowledge imparted in the lecture or course, and must provide reliable examination results. Before assessing the examination results, the person responsible, as determined in clause 1, must ensure that the examination questions adhere to paragraph 4, clause 2. If the examiner finds that individual examination questions are incorrect, these questions are to be disregarded in the determination of examination results. In such cases, the total number of questions is reduced accordingly, and assessment of the examination must be based on this reduced number. Reducing the number of examination questions must not have negative consequences for the candidate.

If an examination consists of multiple choice questions, it is considered passed when at least 50% of the questions have been answered correctly, or when the number of questions correctly answered by the candidate is no less than 22% of the average number of questions answered correctly by all examination candidates (norm-referenced grading).

If a candidate has correctly answered the number of questions required to pass the examination, the multiple choice examination must be assessed as follows. If norm-referenced grading is used, the scale for assessment is moved linearly by the difference between the absolute and relative thresholds for passing.

% corresponds to grade:

%	Grade
≥ 50 – 55	4.0
> 55 – 60	3.7
> 60 – 65	3.3
> 65 – 70	3.0
> 70 – 75	2.7
> 75 – 80	2.3
> 80 – 85	2.0
> 85 – 90	1.7
> 90 – 95	1.3
> 95 – 100	1.0

(4)   If a written examination component is taken as a term paper, the candidate must assure that they are the author of their own work and that no sources or aids other than those indicated were used.

(5)   The assessment period for written examinations should not exceed four weeks.

§ 12   Assessment of examinations, and examination prerequisites

(1)   Grades for the individual examination components are determined by the respective

examiners. The following grades must be used for assessment of examinations:

1 = very good	=	an outstanding performance;
2 = good	=	a performance which lies substantially above average requirements;
3 = satisfactory	=	a performance which fulfils average requirements;
4 = sufficient	=	a performance which, despite deficiencies, still meets the requirements;
5 = failed	=	a performance which, due to considerable deficiencies, does not meet the requirements.

For more detailed assessment of examination performance, grades may be further differentiated by increasing or decreasing the individual grades by 0.3; however, the grade 0.7 and incremental grades above 4.0 may not be used.

(2) Final module grades are calculated using the unrounded grades achieved in the module's examination components, which are weighted according to the number of credits they are worth. If a final examination is to be taken as part of a module, the grade from this final module examination constitutes the overall grade for the module. If an examination is a prerequisite for a subsequent examination, the credits gained for completing this prerequisite are counted in the total number of credits gained for the subsequent examination.

(3) Final module grades and the overall grade for the Bachelor's examination are as follows:

for an average up to and including 1.5	very good
for an average of between 1.6 and up to/including 2.5	good
for an average of between 2.6 and up to/including 3.5	satisfactory
for an average of between 3.6 and up to/including 4.0	sufficient

(4) To determine final module grades and the overall grade of the Bachelor's examination pursuant to paragraph 3, only the first digit after the decimal is taken into account; all other digits are dropped without rounding.

(5) The Bachelor's examination is passed when all examination components have been graded as "sufficient" (4.0) or better. The overall grade for the Bachelor's examination will be calculated in accordance with § 18, paragraph 2.

(6) Examination prerequisites are assessed by an examiner, who determines whether the prerequisites have been "passed" or "failed". Students can request that an examination prerequisite is graded according to the regulations set forth in paragraphs 1 and 2. This request must be made to the examiner before the examination prerequisite is started.

§ 12a Assessment of examinations using the European Credit Transfer System

The following scheme must be used to assess examinations according to the grading scale of the European Credit Transfer System (ECTS grades).

(1)   ECTS grades are calculated on two dates: on 1 May for the previous winter semester, and on 1 November for the previous summer semester. Any subsequent changes made to grades are not taken into account in the allocation of ECTS grades.

(2)   ECTS grades are determined for examination components and for overall degree grades only.

(3)   A minimum of 30 grades must be available in order for ECTS grades to be determined.

(4)   ECTS grades are calculated on the basis of those performances that meet the requirements. Grade "A" is awarded to the top 10% of students who achieve grades in the highest bracket of the grading scheme, as stated in § 12, paragraph 1.
Grade "B" is awarded to the subsequent 25% of students, who achieve grades in the second highest bracket of the grading scheme, as stated in § 12, paragraph 1. The subsequent 30% of students in the next grade bracket are awarded grade "C", and the following 25% of students in the bracket that follows are awarded grade "D". Up to 10% of students who achieve grades in the lowest bracket of the grading scale, as outlined in § 12, paragraph 1, are awarded grade "E".

(5)   The ranking:
   a) for an examination component, the ranking is based on the grades achieved in the same examination in the current semester and in the six preceding semesters;
   b) for a degree, the ranking is based on the final grades achieved for the same degree programme in the current semester and the six preceding semesters.

Section II: Bachelor's examination

§ 13   Bachelor's examination admission requirements

(1)   Admission to the Bachelor's examination for Medical Informatics will only be authorised for students who:
   1. are enrolled in the Bachelor's degree programme in Medical Informatics at Heidelberg University and Heilbronn University,
   2. have not lost their entitlement to take final examinations in a Bachelor's programme in Medical Informatics or another Computer Science degree programme.

(2)   Certificates proving the following must also be provided for admission to the Bachelor's thesis:
   1. successful completion of the orientation examination,
   2. successful completion of the courses and lectures listed in Appendix 1, equating to 140 credits.

§ 14   Admission procedure

(1)   The application for admission to the examination must be made in writing, and

addressed to the acting chairperson of the examinations board. The following must be included in the application:

1. evidence of fulfilment of the admission requirements outlined in § 13, paragraph 1, point 1,

2. a declaration from the candidate confirming whether they have previously failed a Bachelor's examination in a Bachelor's degree programme in Medical Informatics or Computer Science, or whether they are currently involved in an examination procedure in such a programme.

(2) If the candidate is unable to provide evidence in the prescribed form, the examinations board may accept alternative documents as proof.

(3) The examinations board will decide whether to admit the candidate on the basis of the application. Rejections must be substantiated and notified in writing along with instructions for appeal.

(4) The application for admission to the examination may only be rejected if:

1. conditions are not fulfilled in accordance with § 13, or

2. the documents set forth in paragraph 1 are incomplete, and have not been completed upon request, or

3. the candidate has failed their final attempt at the Bachelor's examination in Medical Informatics or another Computer Science degree programme, or has lost their entitlement to take the final examinations, or

4. the candidate is currently involved in an examination procedure in such a degree programme.

§ 15   Scope and nature of the examination

(1) The Bachelor's examination consists of:

1. successful completion of the modules listed in Appendix 1,

2. the Bachelor's thesis

(2) The examinations referred to in paragraph 1, item 1 are taken as an integrated part of the respective courses or lectures. They may be in written, oral or practical form. The type and duration of each examination is stated in Appendix 1.

§ 16   Bachelor's thesis

(1) The Bachelor's thesis serves to demonstrate that the candidate is able to work independently on a problem from the field of Medical Informatics, within a given period of time and using academic methods.

(2) The Bachelor's thesis may be assigned and supervised by any authorised examiner as stated in § 6, paragraph 1, clause 1.

(3) The candidate must begin work on the Bachelor's thesis no later than in the semester following that in which they successfully obtained 140 credits, or the candidate must have by that time submitted an application for assignment of a topic, or a request for an extension, to the acting chairperson of the examinations board. If the candidate fails to

observe this deadline, the Bachelor's thesis will be graded as "failed" (5.0), unless the candidate is not responsible for exceeding the time limit.

(4) The topic of the Bachelor's thesis will be determined by the thesis supervisor in consultation with the candidate. If an application for assignment of a topic is submitted, the acting chair of the examinations board will ensure that the candidate receives a topic for the Bachelor's thesis in due time. The candidate is permitted to make topic suggestions; however, this does not constitute a legal entitlement to a particular topic. The examinations board assigns the thesis topic; the date of assignment must be recorded.

(5) The deadline for submission of the thesis is 16 weeks following the date on which the topic was assigned. In exceptional cases, the examinations board may extend this deadline by up to four weeks. If the deadline is exceeded, the Bachelor's thesis will be graded as "failed", unless the candidate is not responsible for missing the deadline. The topic may only be rejected once, and only within the first two weeks following its assignment.

(6) The topic, task and scope of the Bachelor's thesis must be limited in such a way that the candidate is able to complete the thesis within the given period.

(7) The Bachelor's thesis may be written in German or English. Upon approval from the supervisor and the examinations board, the thesis may also be written in other languages.

§ 17 Submission and assessment of the Bachelor's thesis

(1) The Bachelor's thesis must be submitted to the examinations board by the deadline; the date of submission must be recorded. The thesis must contain a summary.

(2) When submitting their Bachelor's thesis, the candidate must assure in writing that they are the author of their own work and that they have used no sources or aids other than those indicated.

(3) The Bachelor's thesis is assessed by two examiners, one of whom must be a professor. The first examiner should be the supervisor of the thesis. The second examiner is appointed by the examinations board. The candidate is permitted to propose a second examiner. This does not, however, constitute legal entitlement to examination by a particular examiner. The assessment period should not exceed six weeks.

(4) The grade is calculated as the average of the two assessments; § 12 applies accordingly. If the grades differ by more than one grade, the examinations board will determine the final grade for the Bachelor's thesis after consulting both examiners. In such cases, a third examiner may be consulted.

§ 18 Passing the examination and overall grade

(1) The Bachelor's examination is passed when all examination components according to § 15, paragraph 1, have been graded as "sufficient" (4.0) or better.

(2) When calculating the overall grade for the Bachelor's examination in accordance with § 12, paragraph 3, the module grades are weighted according to the number of credits they are worth. In accordance with § 12, paragraph 3, the numerical values of all module grades are considered before rounding in the calculation of the overall grade.

§ 19 Retaking an examination component and deadlines

(1) Failed examinations, or examinations deemed failed may be retaken once. A second retake is only permitted for a maximum of five examination components completed during the course of study. A second retake of the Bachelor's thesis is not permitted.

(2) Examination components which have been successfully passed may not be retaken.

(3) Failed written examinations must be retaken no later than during the following semester. All other examination components must be retaken as soon as possible. If the candidate fails to meet this deadline, they will lose their entitlement to take the examination, unless they are not responsible for the deadline being exceeded.

(4) If a compulsory module examination is failed on the final attempt, the candidate will be excluded from the academic programme. Failure of compulsory elective modules and elective modules may be offset by the successful completion of a different module.

§ 20 Bachelor's diploma and certificate

(1) Upon successful completion of the Bachelor's examination, a diploma will be issued within four weeks. This will list all individual modules with their respective grades (graded in accordance with § 12, paragraph 3, and numerical value) as well as the grade and topic of the Bachelor's thesis, and the overall grade achieved in the Bachelor's examination. The diploma bears the date on which the final examination component was completed, and must be signed by the chair and the acting chair of the examinations board.

(2) A "Diploma Supplement" in German and English is also provided, containing additional information about the course content and period of study. The content complies with the "European Diploma Supplement Model".

(3) A bilingual Bachelor's certificate in German and English will be issued with the diploma, bearing the same date as the diploma. It certifies the conferment of the academic degree, "Bachelor of Science". The certificate is signed by the dean of the Medical Faculty, Heidelberg, and by the dean of the Faculty of Computer Science at Heilbronn University, and bears the seal of the Medical Faculty Heidelberg.

(4) Upon request, and on presentation of supporting documents and the certificate of exmatriculation, a certificate will be issued listing any completed examination components and their respective grades, and the missing examination components. The certificate indicates that the Bachelor's examination has been failed.

Section III: Final provisions

§ 21   Invalidity of examinations

(1)   If a candidate has cheated on an examination and this is not discovered until after the diploma has been issued, the examinations board may correct the examination results for the affected examination components accordingly, and may declare the examination to be partially or completely failed.

(2)   If the requirements for admission to the examination were not fulfilled, but without any intent on the candidate's part to deceive, and this is not discovered until after the diploma has been issued, the passed examination will be considered to compensate for this shortcoming. If the candidate intentionally gained admission to the examination through deceit, the examinations board will make a decision on the matter.

(3)   The candidate will be given the opportunity to provide an explanation before the decision is made.

(4)   The incorrect examination certificate must be confiscated, and, where applicable, a new certificate must be issued. If the examination was graded as "failed" due to deception, the Bachelor's certificate must also be confiscated along with the incorrect examination certificate. Decisions made in accordance with paragraph 1 and paragraph 2, clause 2, may not be made more than five years after the date indicated on the examination certificate.

§ 22   Access to examination documents

After the examination procedure has been completed, the candidate has the right to request access to examination documents within a reasonable period of time. Requests must be made in writing. The request must be submitted within one year of conclusion of the examination procedure. The acting chairperson of the examinations board will decide when and where such access will be given.

§ 23   Coming into force, transitional provisions

(1)   These examination rules and regulations come into force on 1 September 2016. At this point, they supersede the examination rules and regulations dated 12 October 2006 (President's bulletin dated 31 October 2006, p. 1045), last amended on 11 December 2012 (President's bulletin dated 28 February 2013, p. 91).

(2)   Students who, at the point at which these examination rules and regulations become effective, are already enrolled in the Bachelor's programme in Medical Informatics at Heidelberg University and Heilbronn University, may request that their outstanding examination components be completed in accordance with these examination rules and regulations. This request must at the latest be submitted during the semester following the date on which these examination rules and regulations become effective. The previous version of the examination rules and regulations will cease to be valid nine

semesters after these examination rules and regulations come into force. Students will then automatically transfer to these examination rules and regulations.

Heidelberg, 23 May 2016   Heilbronn, 23 May 2016

Prof. Bernhard Eitel   Prof. Jürgen Schröder

Appendix 1: Modules, lectures and courses for the Bachelor's degree programme

Examination type:

CWE = written examination integrated into the course
CPW = practical work integrated into the course
CLW = lab work integrated into the course
CPR = presentation integrated into the course
IWE = interdisciplinary written examination
BT = Bachelor's thesis

Examination prerequisites

PR = project work

Modules B1 - B19 and B21 are compulsory modules. One of the three compulsory elective modules available (20A, 20B, 20C) must be chosen.

			Sem.	WCH	Type	Min.	ECTS	Assessment
171200	B1	**Practical Informatics**	Sem.	WCH	Type	Min.	ECTS	Assessment
171201	B1.1	Fundamentals of Practical Informatics 1	1	4	CWE	90	7	
171202	B1.2	Fundamentals of Practical Informatics 2	2	4	CWE	90	6	
171203	B2	**Medicine**	Sem.	WCH	Type	Min.	ECTS	Assessment
171204	B2.1	Introduction to Biomedical Informatics	1	1	PR		1	
171205	B2.2	Medicine 1	1	4			4	for B2.4
171206	B2.3	Practical Course: Health Care Institutions	1	1	PR		1	
171207	B2.4	Medicine 2	1	2	IWE	120	2	B2.2, B2.4
171208	B3	**Mathematics 1**	Sem.	WCH	Type	Min.	ECTS	Assessment
171209	B3.1	Mathematical Analysis 1	1	8	CWE	90	10	
171210	B4	**Algorithms and Data Structures**	Sem.	WCH	Type	Min.	ECTS	Assessment
171211	B4.1	Algorithms and Data Structures 1	1	2			2	for B4.2
171212	B4.2	Discrete Mathematics	1	2	IWE	90	2	B4.1, B4.2
171213	B4.3	Algorithms and Data Structures 2	2	2	CWE	60	3	
171214	B5	**Theoretical Informatics**	Sem.	WCH	Type	Min.	ECTS	Assessment
171215	B5.1	Logic and Semantics	1	1	CWE	60	1	
171216	B5.2	Theoretical Informatics 1	5	2			2	for B5.3
171217	B5.3	Theoretical Informatics 2	5	2	IWE	90	3	B5.2, B5.3
171218	B6	**Mathematics 2**	Sem.	WCH	Type	Min.	ECTS	Assessment
171219	B6.1	Mathematical Analysis 2	2	6	CWE	90	6	
171220	B7	**Electrical Engineering and Physics**	Sem.	WCH	Type	Min.	ECTS	Assessment
171221	B7.1	Medical Physics	2	2	CWE	60	3	
171222	B7.2	Electrical Engineering	3	4			6	for B7.3
171223	B7.3	Measurement Analysis	3	1	IWE	90	2	B7.2, B7.3
171224	B8	**Mathematics 3**	Sem.	WCH	Type	Min.	ECTS	Assessment
171225	B8.1	Linear Algebra	2	7	CWE	90	7	
171226	B8.2	Fundamentals of Cryptography	3	1	CWE	60	1	
171227	B9	**Software Engineering 1**	Sem.	WCH	Type	Min.	ECTS	Assessment
171228	B9.1	Software Engineering 1	3	4	CWE	90	4	
171229	B9.2	Practical Course: Software Engineering 1	3	3	PR		4	
171230	B10	**Database and Information Systems**	Sem.	WCH	Type	Min.	ECTS	Assessment
171231	B10.1	Database and Information Systems	3	4	CWE	90	6	
171232	B10.2	Knowledge-based Systems	4	2	CWE	60	2	
171233	B10.3	Lab Course: Databases and Information Systems in Health Care	4	2	PR		3	
171234	B11	**Foundations of Medical Informatics**	Sem.	WCH	Type	Min.	ECTS	Assessment
171235	B11.1	Medical Methodology	3	1			1	for B11.2
171236	B11.2	Introduction to Medical Data Management	3	1	IWE	60	1	B11.1, B11.2
171237	B11.3	Fundamentals of Information Systems in Health Care	4	1			1	for B11.4

171238	B11.4	Introduction and Operation of Information Systems in Health Care	4	1	IWE	60	1	B11.3, B11.4
171239	**B12**	**Economics and Law**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171240	B12.1	Hospital Business Studies	4	2			2	for B12.3
171241	B12.2	Structure of the Health Care System	4	1			1	for B12.3
171242	B12.3	Fundamentals of Law	4	2	IWE	120	2	B12.1, B12.2, B12.3
171243	B12.4	Team Management	4	1	CPR		1	
171244	B12.5	Ethics	4	1	CPR		1	
171245	**B13**	**Software Engineering 2**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171246	B13.1	Advance Programming Techniques	4	2	CWE	60	2	
171247	B13.2	Lab Course: Software Engineering 2	4	2	PR		3	
171248	B13.3	Fundamentals of Software Project Management	3	2	CWE	60	2	
171249	B13.4	Lab Course: Software Engineering 3	5	1	PR		3	
171250	**B14**	**Information Security**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171251	B14.1	Coding Theory	5	2			2	for B14.2
171252	B14.2	Information Security	5	2	IWE	90	2	B14.1, B14.2
171253	B14.3	Fundamentals of Distributed Systems	4	2			2	for B14.4
171254	B14.4	Data Protection	4	1	IWE	90	1	B14.3, B14.4
171255	**B15**	**System Informatics**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171256	B15.1	Technical Informatics	2	3			3	for B15.5
171257	B15.2	Lab Course: Technical Foundations of Computer Science	3	2	PR		3	
171258	B15.3	System Programming and Operating Systems	5	3	CWE	60	3	
171259	B15.4	Computer Architecture	4	2	CWE	60	2	
171260	B15.5	Data Transmission	2	2	IWE	90	2	B15.1, B15.5
171261	**B16**	**Stochastics and Biometry**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171262	B16.1	Stochastics	4	4	CWE	90	6	
171263	B16.2	Biometry and Epidemiology	5	2	CWE	60	3	
171264	**B17**	**Medical Informatics**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171265	B17.1	Practical Course: Medical Informatics	5	2	PR		4	
171266	B17.2	Seminar	5	1	CPR		2	
171267	B17.3	Tactical Management of Information Systems in Health Care	5	2	CWE	60	2	
171268	**B18**	**Medical Signal and Image Processing**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171269	B18.1	Fundamentals of Medical Signal Processing	5	2			2	for B18.2
171270	B18.2	Fundamentals of Medical Image Processing	5	2	IWE	90	2	B18.1, B18.2
171271	**B19**	**Foundations of Bioinformatics**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171272	B19.1	Introduction to Bioinformatics	6	2			3	for B19.2
171273	B19.2	Biological and Chemical Methods in Bioinformatics	6	2	IWE	90	3	B19.1, B19.2
171274	**B20A**	**Compulsory Elective Module: Systems for Diagnosis and Therapy**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171275	B20A.1	Diagnosis Systems	6	3			4	for B20A.2
171276	B20A.2	Therapy Systems	6	3	IWE	120	4	B20A.1, B20A.2
171277	B20A.3	Lab Course: Systems for Diagnosis and Therapy	6	2	CLW		4	
171278	**B20B**	**Compulsory Elective Module: Information System Management in Health Care**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171279	B20B.1	Information Management	6	2	IWE	120	3	B20B.1, B20B.2, B20B.3
171280	B20B.2	Hospital Information Systems	6	2			3	for B20B.1
171281	B20B.3	Running a Hospital IT Department	6	2			3	for B20B.1

171282	B20B.4	Lab Course: Management of Hospital Information Systems	6	2	CPW		3	
171283	**B20C**	**Compulsory Elective Module: Telemedicine and Software Development for Information Systems**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171284	B20C.1	Software Engineering 2	6	2			3	for B20C.3
171285	B20C.2	Component-based Software Development	6	2			3	for B20C.3
171286	B20C.3	Telemedicine	6	2	IWE	120	3	B20C.1, B20C.2, B20C.3
171287	B20C.4	Lab Course: Information Systems / Telemedicine	6	2	CPW		3	
171288	**B21**	**Bachelor's thesis**	**Sem.**	**WCH**	**Type**	**Min.**	**ECTS**	**Assessment**
171289	B21.1	Bachelor's thesis	6		BT		12	

The following courses are classified as cross-disciplinary skills as defined in §4:
1. Ethics (4th semester, 1 ECTS)
2. Fundamentals of Law (4th semester, 2 ECTS)
3. Team Management (4th semester, 1 ECTS)
4. Data Protection (4th semester, 1 ECTS)
5. Practical Course: Health Care Institutions (1st semester, 1 ECTS)

Cross-disciplinary skills are integrated into the following courses and modules:

1. Fundamentals of Practical Informatics 1, 2 (team work; 1 ECTS for each)
2. Mathematical Analysis 1 / Linear Algebra (learning and working methods, 1st/2nd semester, 2/1 ECTS)
3. Stochastics and Biometry (academic working methods, 2 ECTS)
4. Practical Course: Software Engineering 1, 2, 3 (project management; 1 ECTS for each)
5. Lab Course:
   a. Systems for Diagnosis and Therapy or
   b. Information Systems
   c. Telemedicine (team work, presentation techniques; 1 ECTS)
6. Lab Course: Management of Hospital Information Systems (team work, presentation techniques; 1 ECTS)
7. Practical Course: Medical Informatics (team work, presentation techniques; 1 ECTS)
8. Lab Course: Technical Foundations of Computer Science (team work, presentation techniques; 1 ECTS)

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