2013 Curriculum for the Master of Science in Human Biology at the Faculty of Health and Medical Sciences, University of Copenhagen

This curriculum is effective from September 1st 2013 and will apply in relation to students admitted on or after this date.

This curriculum was approved by the Dean on 10 April 2013 and revisions on 21 March 2017, 20 March 2018 and 12 March 2019.

This subject-specific curriculum, the course or module descriptions in the overall University of Copenhagen course database, and the general curriculum provisions together comprise the curriculum leading to the degree of Master of Science in Human Biology.

Part 1 Objectives and qualification profile

§ 1 Objectives
The objective of the Master of Science in Human Biology (leading to the degree of Master of Science in Human Biology (MSc in Human Biology) is to qualify graduates within the field of research at the highest international scientific level and to enable them to critically apply existing knowledge within the field of biomedicine.

1.2. Successful completion of the programme gives the graduate the right to use the title of Master of Science (MSc) in Human Biology. The corresponding title in Danish is Cand.scient. i Humanbiologi.

1.3. The degree is credited 120 ECTS points.

1.4. The MSc’s programme is affiliated with the Study Board for Human Biology and Immunology.

1.5 The MSc’s programme is affiliated with the Core of Danish Medical Examiners (Censorkorpset for Lægeuddannelsen).

§ 2 Admission requirements and qualification profile
A total of 40 students are annually admitted to the MSc's programme. To be admitted to the programme applicants must hold a bachelor’s degree in medicine, odontology, biochemistry, biology, pharmaceutics, exercise and sport sciences or a corresponding bachelor’s degree within the fields of health science or natural science. The bachelor’s degree must have been passed with a weighted grade average of 7 or above. Furthermore, admission will be limited to applicants with English language skills corresponding to B level knowledge from a Danish high school (gymnasium) or an international TOEFL-score of minimum of 560 on the paper-based test, or 83 on the internet-based test, or an IELTS test score above 6.5.

2.2. Applications will be assessed by an admission committee. Selection of the admitted students will be made on the basis of an overall evaluation including bachelor’s degree grade average, CV, research experience, any professionally relevant stays abroad and a letter of motivation.

2.3. The bachelor’s degree must have been obtained within the last 5 years prior to the start of the 1st semester of the MSc’s programme.

2.4. Under special circumstances the admissions committee may waive the requirement stipulated in 2.3 above.

2.5. One third of the spots may be reserved for students from countries outside of the EU/EEA.
§ 3 Competence profile
As a minimum, the general competence profile of a Master of Science in Human Biology includes:

Knowledge
• Comprehensive factual and intuitive understanding of how the human organism functions in health and in disease. Such understanding is based on an ability to critically discuss, assess and put into perspective physiological, pathophysiological and pharmacological mechanisms of adjustment and action at various levels that include the molecular, cell, organ and the integrative system level
• Comprehensive knowledge of the original literature of their selected speciality and considerable overall knowledge of the original literature of other sub-fields within biomedical research
• Broad knowledge of research methods and approaches used in the field of biomedical research
• Knowledge of relevant bioinformatic tools and methods
• Knowledge of the clinical everyday life in the hospital sector
• Knowledge of relevant statistical theories and methods
• Knowledge related to the use of laboratory animals
• Comprehensive knowledge of biomedical scientific project design, execution, interpretation, dissemination and presentation, and the ability to put such knowledge into perspective

Skills
• Have the capacity to design, execute, interpret and present experimental studies in the field of biomedicine at a high international scientific level
• Have the ability to critically assess the research results of their peers in the biomedical research field
• Hold a license to work with laboratory animals in accordance with current legislation
• Have the capacity to independently initiate and perform intra- and interdisciplinary cooperative projects and to assume professional responsibilities
• Be able to convey research-based knowledge and to communicate at a high academic level with peers and non-specialists in the fields of biomedicine and health science

Competencies
• Has achieved considerable competence in the use of analytical skills, critical thinking and the ability to collect/find, compound and present information
• Has achieved considerable competence with regard to the retrieval, evaluation and summarizing of new knowledge in the fields of biomedicine and health science
• Has achieved competence with regard to controlling complex work and development situations that are not known in advance and therefore require new solutions
• Has achieved great competence with regard to taking responsibility of continued professional self-development and specialization
Part 2 Modules, instruction, maximum duration of study

§ 4 Modules, instruction
The programme is comprised of modules divided into 3 categories: Natural Science, Health Science and Clinical Subjects.
4.2. Training consists of a combination of lectures and laboratory exercises, and a clinical rotation at a hospital ward or department.
4.3. On the 3rd and 4th semester of the MSc's programme, an experimental thesis project must be completed. The master’s thesis is credited 50 ECTS points.

§ 5 Maximum duration of study
Students must complete the programme no more than 3 years following commencement.
5.2. Under special circumstances the study board may waive the deadlines set out in subsection 5.1.

Part 3 Course and exam activities

§ 6
The MSc’s programme in Human Biology comprises the following courses and exams:

<table>
<thead>
<tr>
<th>1st semester</th>
<th>Bloc 1</th>
<th>Bloc 2</th>
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<tbody>
<tr>
<td></td>
<td>Molecular Biology and Genetics</td>
<td>Human Anatomy and Physiology</td>
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<tr>
<td></td>
<td>2.5 ECTS</td>
<td>7.5 ECTS</td>
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<tr>
<td></td>
<td>Advanced Cell Biology</td>
<td>Oral examination, 20 minutes</td>
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<td></td>
<td>2.5 ECTS</td>
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<tr>
<td></td>
<td>Bioinformatics and Systems Biology</td>
<td>7.5 ECTS</td>
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<td></td>
<td>2.5 ECTS</td>
<td>Written examination, 2 hours</td>
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<tr>
<td></td>
<td>Exam in Molecular Biology and Genetics, Bioinformatics and Systems Biology and Advanced Cell Biology</td>
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<tr>
<td></td>
<td>7.5 ECTS</td>
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<tr>
<td></td>
<td>Oral examination based on written project, 1 hour</td>
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<tr>
<th>2nd semester</th>
<th>Bloc 3</th>
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<tbody>
<tr>
<td></td>
<td>Pharmacology and Toxicology</td>
<td>Laboratory Animal Science</td>
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<tr>
<td></td>
<td>2.5 ECTS</td>
<td>2.5 ECTS</td>
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<tr>
<td></td>
<td>Exam in Pharmacology and Toxicology</td>
<td>Exam in Laboratory Animal Science</td>
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<tr>
<td></td>
<td>5 ECTS</td>
<td>2.5 ECTS</td>
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<tr>
<td></td>
<td>Written examination, 4 hours</td>
<td>Written examination, 2 hours</td>
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<tr>
<td>3rd semester</td>
<td>Bloc 1</td>
<td>Bloc 2</td>
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<tr>
<td><strong>Electives</strong></td>
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<tr>
<td>- Bacterial Biofilm and Their Role in Chronic Infections - 5 ECTS</td>
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<tr>
<td>- Translational Pharmacology - 5 ECTS</td>
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<td>- Grant Application Writing - 5 ECTS</td>
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<tr>
<td>- Introduction to Molecular Bioscience - 5 ECTS</td>
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<tr>
<td><strong>Master's Thesis</strong></td>
<td></td>
<td>25 ECTS</td>
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<table>
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<tr>
<th>4th semester</th>
<th>Bloc 3</th>
<th>Bloc 4</th>
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<tbody>
<tr>
<td><strong>Electives</strong></td>
<td></td>
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<tr>
<td>- Neuronal Signaling - 5 ECTS</td>
<td></td>
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<tr>
<td><strong>Master's Thesis</strong></td>
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<td>25 ECTS</td>
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<tr>
<td></td>
<td></td>
<td>Oral examination</td>
</tr>
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**International Summer Courses:**
- Advanced Methods for the Analysis of Protein Disease Mechanisms – 5 ECTS
- Forensic Genetics and Massively Parallel Sequencing – 5 ECTS

*Students must select elective courses equivalent to a total of 10 ECTS.

§ 7
The programme’s constituent subject elements are:
- All compulsory study and examination activities
- The Master’s thesis
- Elective subjects
The MSc’s programme includes 110 ECTS points of compulsory study and exam activity.
7.2. The MSc’s programme includes 10 ECTS points of elective study and exam activity.
7.3. The MSc’s programme includes a Master’s thesis equivalent to 50 ECTS points.

§ 8
The MSc’s programme includes the following courses and exams:

**First semester, bloc 1**
Course in Molecular Biology and Genetics  
SHUA13027U  
2.5 ECTS

Course in Bioinformatics and Systems Biology  
SHUA13028U  
2.5 ECTS

Course in Advanced Cell Biology  
SHUA13029U  
2.5 ECTS

Exam in Molecular Biology and Genetics, Bioinformatics and Systems Biology, and Advanced Cell Biology  
SHUA13027E  
7.5 ECTS

**First semester, bloc 2**
Course in Human Anatomy and Systems Physiology  
SHUA13004U  
0 ECTS

Exam in Human Anatomy and Systems Physiology  
SHUA13004E  
7.5 ECTS

Course in Immunology and Microbiology  
SHUA13026U  
0 ECTS

Exam in Immunology and Microbiology  
SHUA13026E  
7.5 ECTS

**Second semester, bloc 3**
Course in Human Pathophysiology  
SHUA13031U  
2.5 ECTS
Clinical Rotation
SHUA13032U
2.5 ECTS

Exam in Human Pathophysiology
SHUA13031E
10 ECTS

Course in Pharmacology and Toxicology
SHUA13033U
2.5 ECTS

Exam in Pharmacology and Toxicology
SHUA13033E
5 ECTS

**Second semester, bloc 4**
Course in Laboratory Animal Science
SHUA13030U
2.5 ECTS

Exam in Laboratory Animal Science
SHUA13030E
2.5 ECTS

Course in Statistics and Data Analysis for Human Biologists
SHUA13011U
2.5 ECTS

**Third semester, bloc 1**
Bacterial Biofilms and Their Role in Chronic Infections – elective
SHUA13013U
5 ECTS

Translational Pharmacology – elective
SHUA13014U
5 ECTS

Grant Application Writing – elective
SHUA13022U
5 ECTS

Introduction to Molecular Bioscience – elective
SHUA13023U
5 ECTS

**Third semester, bloc 2**
Neuronal Signaling – elective
SHUA11018U
5 ECTS

Third and fourth semester, bloc 1, 2, 3, 4
Master’s Thesis
SHUA13012U/E
50 ECTS

Fourth semester, Summer
International Summer Course in Advanced Methods for the Analysis of Protein Disease Mechanisms
SHUA13021U
5 ECTS

International Summer Course in Forensic Genetics and Massively Parallel Sequencing
SHUA13025U
5 ECTS

§ 9 Group exams
The MSc’s programme offers no group exams.

§ 10 Instruction and exam languages
The MSc’s programme is conducted in English. The clinical rotation will be in English where possible and otherwise in Danish.
10.2. The Study board may decide that one or more elective courses are conducted in Danish.

§ 11 Elective elements
The MSc’s programme includes an element of elective courses of a total of 10 ECTS points. This element may be scheduled as a Bloc prior to or concurrently with the master’s thesis.
11.2. The study board ensures a number of elective courses, each credited 5 ECTS points. These elective courses are described in the course database and published no later than May 1st.
11.3. The study board must approve the elective course descriptions no later than March prior to the start of the course concerned.
11.4. The study board offers elective courses that are aligned with the objective of the MSc’s programme, see 1.1 above.
11.5. Assessment of elective courses will be done in accordance with the exam types presented in Clause 16 of the Joint Study Programme Provisions (Studieordningernes Fællesdel) of the Faculty of Health and Medical Sciences.

§ 12 Master’s Thesis
During the 3rd and 4th semester of the programme students must complete an experimental master’s thesis. The thesis must demonstrate the student’s ability to formulate, analyse and process issues within a relevant, limited subject in the health sciences in a qualified way.
12.2. The master’s thesis is compiled by each student alone.
12.3. The thesis must be completed in accordance with the approved contract and comprise the equivalent of minimum 50 and maximum 70 A4 pages written in point 12, Times New Roman, line spacing 1.5 and excluding references and optional appendixes. The thesis must include an abstract in English or Danish of no more than one A4 page. The abstract must summarize the problem
formulations, the methods used, significant results/findings, a discussion if relevant, and a conclusion. The abstract will be included in the overall assessment of the master’s thesis.

12.4. When assessing bachelor projects, master’s (candidatus) theses, master’s project and other major written assignments, emphasis must, in addition to the academic content, also be placed on the student’s spelling and writing skills.

12.5. The master’s thesis is credited 50 ECTS points.

12.6. The master’s thesis concludes the master’s programme

Part 5 Concluding remarks

§ 13 Exemptions from these provisions
Under special circumstances, the study board may grant exemptions from any curriculum provisions within the sole remit of the study board.

§ 14 Transitional arrangements
Changes to the curriculum will come into effect from the study year 2019/20. Find details in the document Transitional Arrangements Study Year 2019/20.

§ 15 Date of commencement
This curriculum is effective from September 1st 2013 and will apply in relation to students admitted on or after this date.