2016 Curriculum for the Master of Science programme in Immunology and Inflammation at the Faculty of Medical and Health Sciences, University of Copenhagen

This curriculum comes into force on September 1st 2016 and shall apply in relation to students admitted on or after that date.

The curriculum was approved by the Dean on 17 March 2016 and revisions were approved on 21 March 2017 and the 16th of November 2017.

This subject-specific curriculum, the course or module descriptions in the overall University of Copenhagen course data base, and the general curriculum provisions together comprise the curriculum leading to the degree of Master of Science in Immunology and Inflammation.

Part 1 Objectives and qualification profile

§ 1 Objectives
The objective of the Master of Science programme in Immunology and Inflammation (leading to the degree of Master of Science/MSc in Immunology and Inflammation) is a theoretical and experimental education within the natural and health sciences. It qualifies graduates to find solutions as well as design new therapy strategies to combat human diseases.
1.2. Successful completion of the programme gives the right to use the title of Master of Science (MSc) in Immunology and Inflammation, the Danish title kandidat i immunologi og inflammation, candidatus / candidata scientiarum in Immunology and Inflammation, and cand.scient. in Immunology and Inflammation.
1.3. The degree is worth 120 ECTS credits.
1.4. The programme belongs under the Study Board for Human Biology and Immunology.
1.5 The programme belongs under the Core of Danish Medical Examiners (Censorkorpset for Lægeuddannelsen i Danmark).

§ 2 Admission requirements and qualification profile
A maximum of 30 students may be admitted to the programme annually. 50% of the seats may be reserved for applicants from outside the EU.

2.1 Directly qualifying bachelor’s degrees from Danish universities
Applicants holding one of the following bachelor’s degrees from a Danish university qualify for seeking admission to the programme:
- Biology
- Biochemistry
- Molecular biomedicine/molecular medicine
- Veterinary medicine

2.2. Applicants holding a bachelor’s degree other than the above mentioned from a university in Denmark or abroad may be admitted if it is the assessment of the admissions committee that the Bachelor programme concerned is equivalent in scope and content to one of the Bachelor programmes listed above. The bachelor’s degree concerned must have been gained within the last five years prior to the start of the first semester of the Master’s programme.
2.3. The bachelor’s degree must have been passed with a weighted grade average of 7 or above.
2.4. In exceptional circumstances the admissions committee may waive the requirement stipulated in 2.3 above.

2.5. English language skills
Applicants for whom English is not their first language must submit a document certifying English skills equivalent to Danish high school “Level B” or one of the following language tests: International English Language Testing System (IELTS/Academic) or the Test of English as a Foreign Language (TOEFL). The minimum acceptable score for IELTS is 6.5 and the minimum acceptable score for TOEFL is 560 on the paper test, or 83 on the internet-based test.

2.6. Selection
When selecting students the admissions committee will focus on relevant course work (applicants with a minimum of 15 ECTS course work within immunology will be given priority) as well as documented experience with experimental laboratory work.

§ 3
Programme objectives and competence profile
The MSc in Immunology and Inflammation aims to develop candidates with highly specialized knowledge of immunology, inflammatory diseases, allergy and related topics such as immunopathology, -toxicology, -pharmacology, -therapy, and translational medicine. Moreover, the education will focus on methodologies and newly developed in vitro and in vivo models that will complement the formation of the candidates with practical skills for a better and faster integration in their future employment within immunological research. During the programme students will acquire the knowledge, skills, and competencies listed below enabling the graduates to work in the field of immunology. In addition to this, the students will acquire a number of individual qualifications through taking elective courses, and producing a master’s thesis based on experimental laboratory work.

Knowledge
Masters of Science in Immunology and Inflammation will:
- Possess highly specialized knowledge of immunology, inflammatory diseases, and allergy with emphasis on immune-pathology, -toxicology, -regulation, -pharmacology, -therapy, infectious diseases, microbiota and the immune system, and translational medicine within diverse areas of immunological research, disease prevention, and healthy aging.
- Possess knowledge on methodology and novel models for as well as practical skills, allowing for critical reflections on scientific methods used in the different fields of immunological research.
- Possess insight into the field of innovation and the R&D value chain from an industrial point of view.

Skills
Masters of Science in Immunology and Inflammation will be able to:
- Demonstrate ability to critically evaluate the established knowledge within immunology.
- Demonstrate ability to plan, perform, analyze, and critically evaluate own, and others immunological research.
- Critically evaluate, discuss and prioritise among scientific literature and key methodologies in the field of immunology, with regard to validity, reliability, and applicability.
• Apply biological models and methods to quantify complex immunological processes from molecular- to whole body level, considering the impact of genetic, physiological and environmental factors.
• Communicate and discuss evidence-based immunological knowledge with researchers (specialists, and non-specialists) or lay-persons within or outside the employing organization.
• Achieve a personal license to independently plan, implement and take responsibility for the design and performance of animal experimentation within the European Union according to EU Directives and the Danish law.

Competencies
Masters of Science in Immunology and Inflammation will have the competences to:
• Identify, and handle complex issues of immunology research, interpreting information in a systematic and competent way to make informed judgment and design programs and solutions to problems that arise, based on the best international research, of theories and methods.
• Evaluate, validate and disseminate existing data and design, carry out and co-ordinate scientifically valid and focused research, to advance knowledge in a particular problem area or issue of immunology.
• Perform research and develop and disseminate knowledge at various levels based on broad academic knowledge of immunology, and immune-related topics.
• Advise on, and formulate effective responses to complex practical immunological issues.
• Work effectively with cross-disciplinary problems on an individual basis as well as in teams, and be able to provide evidence-based solutions to immunological based pathologies.
• Independently assess and organize their own learning process and assume responsibility for continuous professional development with a view to life-long learning.
• Identify potential candidates for novel targets for future immuno-modulatory-, or immune-based therapies.

Part 2 Modules, instruction, maximum duration of study

§ 4 Modules, instruction
The programme consists of five compulsory modules (including the master’s thesis) and three elective courses, of which students must choose two.
4.2. Instruction and training consists of dialogue-based classroom sessions and laboratory exercises augmented by lectures.
4.3 On the third and fourth semesters of the master's programme, an experimental thesis project must be completed. The scope of the thesis project is 60 ECTS points.

§ 5 Maximum duration of study
Students must complete the programme no more than three years following commencement.
5.2. In exceptional circumstances the Study Board may waive the deadlines in 5.1 above.
Part 3 Study and exam activities

§ 6
The Master’s programme in Immunology and Inflammation comprises the following courses and exams:

<table>
<thead>
<tr>
<th>1st semester</th>
<th>2nd semester</th>
<th>3rd semester</th>
<th>4th semester</th>
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<tbody>
<tr>
<td><strong>Bloc 1</strong></td>
<td><strong>Bloc 2</strong></td>
<td><strong>Bloc 3</strong></td>
<td><strong>Bloc 4</strong></td>
</tr>
<tr>
<td>Advanced Basic Immunology</td>
<td>The Immune Response to Infection</td>
<td>Allergy, Autoimmunity and inflammation</td>
<td>Electives:</td>
</tr>
<tr>
<td>7.5 ECTS</td>
<td>7.5 ECTS</td>
<td>15 ECTS</td>
<td>Total 15 ECTS:</td>
</tr>
<tr>
<td>Oral examination based on synopsis</td>
<td>Written 3-hour examination</td>
<td>Written 2-hour examination</td>
<td>Immune Pharmacology</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>Laboratory Animal Science</td>
<td>The Immune Defence and Cancer</td>
<td>Electives:</td>
<td>3-hour written examination</td>
</tr>
<tr>
<td>7.5 ECTS</td>
<td>7.5 ECTS</td>
<td>Total 15 ECTS:</td>
<td>Neuroimmunology</td>
</tr>
<tr>
<td>Written 2-hour examination</td>
<td>Oral examination</td>
<td>Total 15 ECTS:</td>
<td>7.5 ECTS</td>
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<td></td>
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<td></td>
<td>2-hour written examination</td>
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**Second year:**

<table>
<thead>
<tr>
<th>3rd semester</th>
<th>4th semester</th>
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<tbody>
<tr>
<td><strong>Bloc 5 and 6</strong></td>
<td><strong>Bloc 7 and 8</strong></td>
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<tr>
<td>Master’s thesis</td>
<td>Master’s thesis</td>
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<tr>
<td>30 ECTS</td>
<td>30 ECTS</td>
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<td></td>
<td>Written paper with 60 min. oral exam (presentation and discussion)</td>
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6.2 Electives
In bloc 4 of the second semester students must complete a compulsory element of electives worth a total of 15 ECTS credits. Alternatively, students may complete similar courses at other universities or institutes of higher education depending on individual approval of the study plan by the Study Board.

§ 7
The programme consists of 105 ECTS credits from compulsory study and exam activity of which the master’s thesis is worth 60 ECTS credits.

7.2. The programme consists of 15 ECTS credits from elective study and exam activity.
§ 8
The programme includes the following courses and exams:

1st semester, bloc 1
Course in Advanced Basic Immunology
SIIK17001U
ECTS: 0

Exam in Advanced Basic Immunology
SIIK17001E
ECTS: 7.5

Course in Laboratory Animal Science
SIIK17002U
ECTS: 0

Exam in Laboratory Animal Science
SIIK17002E
ECTS: 7.5

1st semester, bloc 2
Course in The Immune Response to Infection
SIIK16002U
ECTS: 0

Exam in The Immune Response to Infection
SIIK16002E
ECTS: 7.5

Course in The Immune Defence and Cancer
SIIK16003U
ECTS: 0

Exam in The Immune Defence and Cancer
SIIK16003E
ECTS: 7.5

2nd semester, bloc 1
Course in Allergy, Autoimmunity and Inflammation
SIIK16004U
ECTS: 0

Exam in Allergy, Autoimmunity and Inflammation
SIIK16004E
ECTS: 15

2nd semester, bloc 2
Two elective courses:

Course in Immune Pharmacology
SIIK17003U
ECTS: 0

Exam in Immune Pharmacology
SIIK17003E
ECTS: 7.5

Course in Neuro Immunology
SIIK16006U
ECTS: 0

Exam in Neuro Immunology
SIIK16006E
ECTS: 7.5

3rd semester
Master’s Thesis
SIIK16007U
ECTS: 0

4th semester
Master’s Thesis
SIIK16007U
ECTS: 0

Exam in Master’s Thesis
SIIK16007E
ECTS: 60

§ 9 Group exams
There are no group exams in this programme.

§ 10 Instruction and exam languages
The programme is conducted in English.

§ 11 Electives
The master’s programme includes a compulsory element of electives worth a total of 15 ECTS credits taken in the second semester, bloc 4.
11. 2. The Study Board must ensure that students have access to at least 2 elective courses, each worth 7.5 ECTS credits. These elective courses are described in the course database and announced no later than May 1st in the preceding semester.
11. 3. The Study Board must approve the descriptions of the electives no later than a year prior to the start of the course concerned.
11. 4. The Study Board offers electives in keeping with the objective of the Master programme, see 1.1 above.

§ 12 Master’s thesis
During semester three and four of the programme students must complete a master’s thesis. The thesis must demonstrate the student’s ability to formulate, analyse and process issues within a relevant, limited subject in the medicine and health sciences in a qualified way.
12.2. The master’s thesis must be executed alone and be completed in accordance with the approved contract and comprise the equivalent of c. 60-70 A4 pages in 12 point Times New Roman. The thesis must be furnished with an abstract in English of no more than one A4 page. The abstract must summarize the research question, the methods used, important findings, a discussion if relevant, and a conclusion. The abstract will be included in the overall assessment of the master’s thesis.

12.3. Assessment will be based on the student’s spelling and writing skills as well as the scientific content of the thesis. The scientific content will carry most weight.

12.4. The thesis may also comprise a published or unpublished scientific article in the field of immunology and inflammation, written or co-written by the student. If there is more than one author, each must submit a signed co-writer statement specifying the part or parts of the article for which he or she is responsible. The co-writer statement must reflect the relative contributions at the time of submission as a Master’s project. The student will be examined on the article in accordance with the rules applying to the Master’s thesis exam in general.

12.5. The master’s thesis is worth 60 ECTS credits.

Part 5 Concluding remarks

§ 13 Special provisions only affecting this particular programme
None

§ 14 Transitional arrangements
Changes to § 2.3 will come into force for the admission year 2018 and after.
Changes to § 6 will come into force for students admitted to the programme in September 2017 and after: The new course and exam in Laboratory Animal Science (SIIK17002U/E) will be offered for the first time in the fall of 2017. The reduction in ECTS-credits for the course and exam in Advanced Basic Immunology (SIIK16001U/E) will come into effect from the fall of 2017.

§ 15 Exemptions from these provisions
In exceptional circumstances, the study board may grant exemptions from any curriculum provisions within the sole remit of the Study Board.

§ 16 Date of commencement
September 1st 2017