Curriculum for the Master of Science in Neuroscience at the Faculty of Health and Medical Sciences, MedSchool, University of Copenhagen

This curriculum comes into force on September 1, 2020 and shall apply in relation to students admitted on or after this date.

The curriculum was approved by the Dean on March 2020 and changes where approved on 23 March 2021, 8 March 2022, 25 October 2022 and March 2023

The curriculum leading to the degree of Master of Science in Neuroscience is comprised by the subject-specific curriculum, the course and exam descriptions in the course database and the General Programme Regulations.

Part 1 Objectives and competence profile

§1 Objectives

The objective of the Master of Science programme in Neuroscience (leading to the degree of Master of Science/MSc in Neuroscience) is a theoretical and experimental research-based education within the natural and health sciences. It qualifies graduates to find solutions in neuroscience and for patients with brain disorders while working with highly specialized knowledge of the cells of the brain, their circuits, and higher brain functions. The programme qualifies candidates to apply for a PhD-programme.

1.2 Successful completion of the programme gives the right to use the title Master of Science (MSc) in Neuroscience (in Danish: kandidat I neurovidenskab), candidatus/candidata scientiarum in Neuroscience, and cand.scient. in Neuroscience.

1.3 The degree is credited with 120 ECTS-points.

1.4 The programme is affiliated with the Study Board for Human Biology, Immunology and Neuroscience.

1.5 The programme is affiliated with the Core of Danish Medical Examiners (Censorkorpset for Lægeuddannelserne i Danmark).

§2 Admission requirements

A maximum of 30 students are admitted to the programme annually. One third of the seats may be reserved for students from countries outside of the EU/EEA.

Directly qualifying bachelor's degrees from Danish universities

2.2 There are no bachelor's degrees that give legal right of admission to the MSc in Neuroscience. Applicants holding one of the bachelor's degrees listed below from a Danish University are considered to meet all academic admission requirements and have direct access to apply to the MSc in Neuroscience:

- Biology
- Biochemistry
- Biology-Biotechnology
- Biomedicine
- Medicine
- Medicinal Biology
- Molecular Biomedicine

- Molecular Medicine
- Molecular Biology
- Biochemistry and Molecular Biology
- Veterinary Medicine
- Cognitive Data Science with a specialisation in Neuroscience – University of Copenhagen

Other bachelor's degrees from Danish universities
- Medicine with Industrial Specialization
- Pharmaceutical Sciences

Applicants holding one of the two bachelor's degrees listed above must also document a minimum of 30 ECTS-points within three of the following fields: cell biology, biochemistry, genetics and/or molecular biology at university level.

2.3 Applicants with a bachelor's degree other than the above mentioned from a university in Denmark or abroad can be admitted if the degree is within the following areas:
- Health sciences
- Life sciences
- Biological sciences

2.4 The bachelor's degree must be obtained within the last five years prior to the start of the first semester of the Master's programme.

2.5 In exceptional circumstances the admissions committee may waive the requirement stipulated in 2.1 and 2.2 above.

2.6 English language skills

Applicants must submit a certificate documenting one of the following:
- English skills equivalent to Danish secondary school 'English level B' with a weighted average of 3 (Danish grading scale)
- English skills equivalent to Danish secondary school 'English level A" with a weighted average of 2 (Danish grading scale)
- One of the following language tests:
  - IELTS-test (British Council) with a minimum score of 6.5
  - Paper-based TOEFL-test with a minimum score of 560 points
  - Internet-based TOEFL-test with a min score of 83 points
  - Passed Cambridge English Certificate: Advanced (CAE) – level C1

2.7 Applicants with a degree from an English taught qualifying upper secondary school diploma, bachelor's degree or master's degree from USA, Canada, Australia, New Zealand, UK or Ireland are exempted from the language requirement.

§3 Competence profile

The MSc in Neuroscience aims to develop graduates with highly specialized competences that qualifies them to work in interdisciplinary teams and apply research-based knowledge to solve complex problems and challenged to find new applications in the field of neuroscience. Graduates will acquire highly specialized and research-based knowledge and competences within basic neuroscience, experimental neuroscience, translational neuroscience, and to some extent clinical neuroscience. During the programme, students will acquire the knowledge, skills and competencies listed below enabling the graduates to work in neuroscience and beyond. The programme focuses on methodologies and newly developed in vitro and in vivo models. This

will secure practical skills within neuroscience research and applications that enables the students to apply their knowledge to solve complex problems in neuroscience and beyond. In addition, the students will acquire several individual qualifications while taking elective courses in applied neuroscience, and producing a master''s thesis based on own experimental laboratory work.

Knowledge

Masters of Science in Neuroscience will possess:

- Knowledge of neurological and psychiatric diseases
- Knowledge of pathology, mechanisms, diagnostics and treatments of CNS disorders
- Broad knowledge of the understanding of the brain and its structure and function
- Understanding of the function of neurons and glia cells
- Understanding of the mechanisms of perception, locomotion, vascularization, homeostasis, and inflammation of the brain.
- Detailed knowledge of higher brain functions, such as emotions, memory, attention, language and executive functions, and their definitions,
- Knowledge of the underlying mechanisms behind higher brain functions
- Knowledge of methods, definitions and tools in neuroscience.
- Knowledge of the role of gene variations in populations and their transcripts in cells
- Detailed knowledge in relation to the function of the brain in health and disease
- Detailed knowledge of technologies used to determine various measures in the brain such as drugs, medico-technology, as well as digital solutions
- Ability to reflect upon and discuss the contribution of neuroscience to other disciplines and fields

Skills

Masters of Science in Neuroscience will be able to:

- Correlate cellular and molecular mechanisms to brain function on a circuit or structural level
- Master neuroscientific tools, as well as more general tools relevant in neuroscience
- Evaluate relevance and ability of neuroscientific methods and theories for their use in practice
- Understand and combine scientific methods and tools, in order to evaluate hypotheses and theories in neuroscience
- Communicate and discuss research-based knowledge in a context both with neuroscientist and people with less background knowledge in the field

Competences

Masters of Science in Neuroscience will have the competences to:

- Independently plan and execute neuroscientific experiments and interpret neuroscience data and literature.
- Independently develop and evaluate solutions to scientific problems within neuroscience.
- Work independently as well as in teams.
- Independently initiate work and development processes within the neurosciences
- Systematically and independently be critical to literature in neuroscience
- Organize own career and development

Part 2 Modules, instruction, maximum duration of study

§4 Modules and methods of instruction
The programme consists of four compulsory courses (including the master's thesis) and three elective courses.
4.2. Instruction and training consists of dialogue-based and classroom sessions e.g. journal clubs, data analysis and laboratory exercises augmented by lectures.
4.3 An experimental master's thesis must be completed on the third and fourth semester of the programme. The master's thesis is credited with 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 Compulsory, constituent subject elements and elective elements
6.1. The programme's constituent subject elements are:

- Compulsory study and examination activities 45 ECTS
- The Master's Thesis 60 ECTS
- Elective subjects 15 ECTS

§ 7 Study and exam activities

7.1 Table of courses and exams

First semester, Outline of courses, exams and ECTS-points

Courses and ECTS-points	**Course attestation code**	**ECTS**	**Exam registration code**	**ECTS**
Neuroscience I: Cells and Circuits SNEU21001U	Neuroscience I: Cells and Circuits SNEU21001E	2,5	Exam in Neuroscience I: Cells and Circuits SNEU21002E	17,5
Experimental design in Neuroscience SNEU23005U			Exam in Experimental design in Neuroscience: SNEU23005U	10

Second semester, Outline of courses, exams and ECTS-credits

Courses and total ECTS-points	Course attestation code	ECTS	Exam registration code	ECTS
Neuroscience II: Higher brain function SNEU20004U	SNEU20004E	2,5	Exam in Neuroscience II: Higher brain function SNEU20005E	12.5
Drug discovery and development in Neuroscience - elective SNEU20006U			Exam in Drug discovery and development in Neuroscience SNEU20006E	7.5
Computational Neurosciences - elective SNEU20007U			Exam in Computational Neurosciences SNEU20007E	7.5
Laboratory Animal Neuroscience and Neurosurgery SNEU23004U			Exam in Laboratory Animal Neuroscience and Neurosurgery SNEU23004E	7.5

Third and fourth semester, Outline of courses, exams and ECTS-points

Title, course registration code	Course attestation code	ECTS	Exam registration code	ECTS
Master's Thesis in Neuroscience SNEU20009U			Exam in Master's Thesis in Neuroscience SNEU20009E	60

7.2 Electives
In the second semester, students must complete a compulsory element of electives worth 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.

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

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

§10 Elective courses

The master's programme includes a compulsory module of elective courses on the second semester.
10. 2. The Study Board must ensure that students can select two out of three 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 study year.
10. 3. The Study Board offers electives that are aligned with the objective of the Master programme, see 1.1 above.

§11 Master's thesis

During the third and fourth semester of the programme students must complete a master's thesis. The thesis must demonstrate the student's ability to competently formulate, analyse, process, discuss and assess problems and to undertake experimental scientific work on a relevant, limited neurological topic. The thesis will equip students to communicate research-based knowledge, and to discuss matters of scientific research with fellow professionals and non-specialists.
11.2. The master's thesis must be prepared individually 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 accompanied by an abstract in English 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.
11.3 Assessment of the master's thesis will, in addition to the academic content, also be placed on the student's spelling and writing skills.

11.4. The master's thesis is credited with 60 ECTS-points.

Part 4: Specific provisions

§12 Transitional arrangements

By the academic year 2023/24 the exam in Experimental Design in Neuroscience SNEU20002U will change from written to oral examination.

By the academic year 2023/34 a new elective course will be added: Laboratory Animal Neuroscience and Neurosurgery NYKODE and replace previous elective course in Novel Technologies and Laboratory Animal Sciences in Neurosciences SNEU22001U.
For students that have participated in the course SNEU22001U before September 1st 2023 but not passed the exams for 7,5 ECTS (SNEU22001E and SNEU22002E), will have to take the exams in the following periods:

- Summer examination 2024
- Summer reexamination 2024
- Summer examination 2025

By the academic year 2021/22, the exam in *Novel technologies and Laboratory Animal Sciences in Neurosciences* (elective) will change from written to oral examination.

By the academic year 2021/22 a new written exam is introduced to the course Neuroscience I: Cells and Circuits.

Part 5: Concluding remarks

§13 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.

§14 Date of commencement

This Study Curriculum takes effect on September 1st, 2023.