# Neuroscience

This section presents the requirements for programs in:
- M.Sc. Neuroscience
- Ph.D. Neuroscience

## Program Requirements

### M.Sc. Neuroscience (5.0 credits)

**Requirements:**

<table>
<thead>
<tr>
<th>Credit Type</th>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 credit in:</td>
<td>NEUR 5100</td>
<td>Fundamentals in Neuroscience</td>
</tr>
<tr>
<td>0.5 credit in:</td>
<td>NEUR 5201</td>
<td>Statistics for Neuroscience I</td>
</tr>
<tr>
<td>0.5 credit from:</td>
<td>NEUR 5202</td>
<td>Statistics for Neuroscience II</td>
</tr>
<tr>
<td></td>
<td>NEUR 5800</td>
<td>Special Topics in Neuroscience</td>
</tr>
<tr>
<td></td>
<td>NEUR 5801</td>
<td>Knowledge Mobilization</td>
</tr>
<tr>
<td></td>
<td>NEUR 5000</td>
<td>Foundations in Neuroscience</td>
</tr>
<tr>
<td>3.0 credits in:</td>
<td>NEUR 5909</td>
<td>M.Sc. Thesis</td>
</tr>
</tbody>
</table>

**Total Credits** 5.0

### Ph.D. Neuroscience (3.0 credits)

**Requirements:**

<table>
<thead>
<tr>
<th>Credit Type</th>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 credit in:</td>
<td>NEUR 6100</td>
<td>Advanced Seminar in Neuroscience</td>
</tr>
<tr>
<td>1.0 credit in:</td>
<td>NEUR 6200</td>
<td>Comprehensive Examination (to be completed within the first two years of PhD study)</td>
</tr>
<tr>
<td>0.5 credit in:</td>
<td>NEUR 5201</td>
<td>Statistics for Neuroscience I</td>
</tr>
<tr>
<td></td>
<td>NEUR 5202</td>
<td>Statistics for Neuroscience II</td>
</tr>
<tr>
<td></td>
<td>NEUR 5909</td>
<td>Ph.D. Thesis (Candidates must successful complete a research thesis on a topic in Neuroscience supervised by a faculty member of the Department of Neuroscience)</td>
</tr>
</tbody>
</table>

**Total Credits** 3.0

### Optional courses

Candidates may choose from the following list of optional courses:

- Up to 1.0 credit from:
  - NEUR 5000 | Foundations in Neuroscience |
  - NEUR 5800 | Special Topics in Neuroscience |
  - NEUR 5801 | Knowledge Mobilization |
- Up to 1.0 credit from:
  - NEUR 6301 | Techniques in Neuroscience I |

### Regulations

See the General Regulations section of this Calendar.

### Admission

The minimum requirement for admission to the Master's program in Neuroscience is either a B.Sc. Honours in Neuroscience, Biology, or related field, or a B.A. Honours in Psychology. Applicants with other bachelor's honours degrees in related disciplines will also be considered provided the applicant can demonstrate a strong background that relates to neuroscience.

In addition to transcripts and letters of reference, application packages must include a statement of interest. Applicants without a background in neuroscience may be required to complete NEUR 5000 as part of their M.Sc. program.

Meeting the minimum requirements does not automatically guarantee acceptance into the program.

### Fast Track Option

Students who enroll in the M.Sc. program, and intend to subsequently continue into a Ph.D., may have the option of being fast-tracked into the Ph.D. program. Eligibility will be determined by recommendation from the M.Sc. thesis committee, the Graduate Chair in Neuroscience, and the Dean of Graduate and Postdoctoral Affairs. Advanced standing will be given for NEUR 5201. The decision and required approvals to fast track must be completed by July 31 of the student's third semester.

Regulations governing requirements for the Master's thesis, including deadlines for submission, are outlined in the General Regulations section of this Calendar.
Neuroscience (NEUR) Courses

NEUR 5000 [0.5 credit]
Foundations in Neuroscience
A comprehensive, lecture-based course which will
cover the foundational principles of neuroscience for
students with a limited background in neuroscience.
Topics include neural signalling, sensation, movement,
neurodevelopment, neuroplasticity, neuroendocrinology,
learning and memory, and other complex brain functions.
Prerequisite(s): permission of the Department.

NEUR 5100 [1.0 credit]
Fundamentals in Neuroscience
A general course covering core neuroscience topics
including organization of the nervous system, sensory and
motor systems, neuroendocrinology, motivation learning
and memory, emotion, attention, and pathology. Course
includes attendance of the neuroscience colloquium
series.
Also listed as BIOL 5304.
Precludes additional credit for PSYC 5200.

NEUR 5201 [0.5 credit]
Statistics for Neuroscience I
Concepts and applications of basic statistical methods.
Power determinations, t-tests, analysis of variance
designs, including factorial, within groups, and hierarchical
designs, analysis of covariance, and follow-up tests.
Extensive use of statistical software.
Precludes additional credit for PSYC 5410.

NEUR 5202 [0.5 credit]
Statistics for Neuroscience II
Concepts and applications of advanced regression
analyses, including multiple regression, hierarchical
and polynomial techniques, factor analysis and cluster
analysis. Extensive use of statistical software.
Precludes additional credit for PSYC 5411.

NEUR 5203 [0.5 credit]
Systematic Reviews and Meta-Analysis
Introduces the methodology for conducting systematic
reviews and meta-analysis. Topics include: conducting
literature searches, extracting relevant literature,
assessing quality of studies, and synthesizing findings
across studies. Students will be expected to identify a
research question, identify relevant literature, and carry
out the statistical software.
Prerequisite(s): NEUR 5201.

NEUR 5800 [0.5 credit]
Special Topics in Neuroscience
An in depth study of current topics in neuroscience and
health. Course content varies yearly and has recently
included cognitive neuroscience, neuropharmacology,
neurodegeneration, neuroimmunology, behavioural
medicine, neurobiology of learning and memory, brain
mechanisms of ingestive behaviour and energy balance,
and molecular neuroscience.
Also listed as BIOL 6203.

NEUR 5801 [0.5 credit]
Knowledge Mobilization
Knowledge mobilization concepts, tools, and frameworks,
the challenges and value of translational research, and
processes involved in integrated knowledge mobilization.
Skills to maximize research impacts will be developed.
Includes: Experiential Learning Activity
Precludes additional credit for HLTH 5300.

NEUR 5909 [3.0 credits]
M.Sc. Thesis
Includes: Experiential Learning Activity

NEUR 6100 [1.0 credit]
Advanced Seminar in Neuroscience
A comprehensive pro-seminar series, covering
issues ranging from cellular and molecular processes
through to neural systems and behaviours as well as
psychopathology. Students will also be required to attend
the Neuroscience colloquia series as part of this course.
Also listed as BIOL 6305.
Precludes additional credit for PSYC 6200, PSYC 6202,
PSYC 6203, BIOL 6303, BIOL 6306.
Prerequisite(s): NEUR5100 or equivalent.

NEUR 6200 [1.0 credit]
Comprehensive Examination
The comprehensive examination will consist of either a
grant proposal or a review paper, to be decided by the
student in consultation with their supervisor.
The topic of the comprehensive examination must be
outside of the candidate’s primary area of specialization
and must be completed within the first two years of PhD
study.

NEUR 6301 [0.5 credit]
Techniques in Neuroscience I
Completion of a research project carried out under the
supervision of a neuroscience faculty member, normally
not the current supervisor. The student will learn a
new neuroscience technique and apply it to a research
objective. Students must obtain prior approval from the
graduate committee.
Precludes additional credit for PSYC 6204.

NEUR 6302 [0.5 credit]
Techniques in Neuroscience II
Completion of a research project carried out under the
supervision of a neuroscience faculty member, normally
not the current supervisor. The student will learn a
new neuroscience technique and apply it to a research
objective. Students must obtain prior approval from the
graduate committee.
Precludes additional credit for PSYC 6204.
NEUR 6401 [0.5 credit]
Independent Research in Neuroscience I
Permission to register and approval of research plan must be obtained from the graduate committee. A final research report must be filed in the departmental office prior to submission of course grade.
Includes: Experiential Learning Activity
Precludes additional credit for PSYC 5901 and PSYC 6901.

NEUR 6402 [0.5 credit]
Independent Research in Neuroscience II
Permission to register and approval of research plan must be obtained from the graduate committee. A final research report must be filed in the departmental office prior to submission of course grade.
Includes: Experiential Learning Activity
Precludes additional credit for PSYC 5901 and PSYC 6901.

NEUR 6501 [0.5 credit]
Directed Studies in Neuroscience I
In-depth investigation of selected topics in neuroscience by means of directed library research. Registration is restricted, permission to register being granted only by the graduate committee. A final report must be filed in the departmental office prior to submission of course grade.
Precludes additional credit for PSYC 5900 and PSYC 6900.

NEUR 6502 [0.5 credit]
Directed Studies in Neuroscience II
In-depth investigation of selected topics in neuroscience by means of directed library research. Registration is restricted, permission to register being granted only by the graduate committee. A final report must be filed in the departmental office prior to submission of course grade.
Precludes additional credit for PSYC 5900 or PSYC 6900.

NEUR 6909 [0.0 credit]
Ph.D. Thesis
Includes: Experiential Learning Activity