A Student’s Guide to Neuroscience at Dalhousie University

In this guide, you will find information about:

- University Requirements
- First-Year Requirements
- Major in Neuroscience (120-credit hour)
- Double-Major with Neuroscience
- Honours in Neuroscience
- Combined Honours in Neuroscience
- Major in Neuroscience (90-credit hour)
- Minor in Neuroscience
- Certificates
University Requirements

General Degree Requirements
The University mandates that students in a BA or BSc program must meet specific requirements to complete their degree. In addition to degree requirements, each Program (e.g., Neuroscience) has a set of requirements necessary to complete the program. It is important to know both the degree and program requirements to ensure successful completion of a degree. For a full list of University requirements, please check the Academic Calendar.

Subject Groupings
Course offerings within the College of Arts and Science are placed into three subject groupings: (1) Languages and Humanities, (2) Social Sciences, and (3) Life and Physical Sciences. All BA and BSc programs must include a minimum of 6-credit hours from each of the three subject groupings.

Writing Course Requirements
An approved writing course or set of courses is required for all BA (6-credit hours) and BSc (3-credit hours) degrees. It is recommended that students complete the writing requirement early in their programs, preferably in their first year of study.

Math Requirements (BSc)
A minimum of 6-credit hours in mathematics or statistics are required for all BSc programs. See Academic Calendar for list of approved courses.

Language Requirements (BA)
BA students are required to obtain 6-credit hours in a language course or set of courses. See Academic Calendar for list of approved courses.

Pro Tip:
Use the Degree Audit Reporting System (DARS) on DalOnline, to ensure you’re on track for graduation. DARS will show you all the requirements you need for your degree; identifying those you’ve met and those you have yet to complete.
First-Year Requirements

All Neuroscience programs (e.g., BSc, Honours, Double-Major, etc.) have the same program requirements for the first-year. Remember to check the Academic Calendar for University requirements for all BA and BSc degrees.

1000-level Program Requirements

- Introduction to Psychology I (PSYO1011, 1021, or 1031)*
- Introduction to Psychology II (PSYO1012, 1022, or 1032)*
- Biology I (BIOL1010 or 1020)*
- Biology II (BIOL1011 or 1021)*
- Chemistry I (CHEM1011)
- Chemistry II (CHEM1012)
- MATH1215 (recommended) or MATH1000
- One other half credit in Math or Statistics (STAT1060 recommended)
- Note: the Dalhousie Integrated Science Program (DISP) is considered equivalent to all of the above (SCIE1505X/Y)

* Final grade of B- or better is required

Pro Tip:
We recommend students declare their major in the early winter (Jan-Feb) of their first year. Head to DalOnline to easily declare your major and update it at any point throughout your degree.
Major in Neuroscience (120-credit hour)

For 1000-level program requirements, see page 2. For all other University degree requirements, see the current Academic Calendar.

**2000-level Program Requirements**
- NESC2007 – Neuroscience Principles and Methods
- NESC2470 – Systems Neuroscience (or equivalent)
- NESC2570 – Cellular Neuroscience
- PSYO2501 – Statistical Methods (recommended to be taken concurrently with NESC2007)
- BIOL2020 – Cell Biology
- Two selections from: NESC2130, NESC2140, NESC2150, NESC2160, BIOC2300, BIOL2030, PHYC2250

**3000/4000-level Program Requirements**
- **Two lab classes (6-credit hours total),** selected from:
  - NESC 3044, 3051, 3137, 3161, 3165, 3370, 3371, 3440, 3775
- **Two classes (6-credit hours total),** selected from:
  - NESC 3043, 3052, 3131, 3132, 3133, 3134, 3162, 3165, 3170, 3180, 3190, 3227, 3237, 3260, 3264, 3270, 3670, 3770, 3790, 3970, PHYL3420, PHAC3001, PHAC4001
- Additional **12-credit hours** of 3000/4000-level Neuroscience courses

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**Pro Tip:**
Look ahead to 3rd and 4th year courses to see what prerequisites you may need, use that info to help you choose your 2nd year classes.
Double-Major in Neuroscience (120-credit hour)

Students may take a degree that combines a Major in Neuroscience with another subject, such as Biochemistry or Biology. Students cannot take Psychology as their other subject. If electing to complete a Double-Major, students must select one subject as the primary and one as the secondary. Requirements for the 3000/4000-level differ depending on whether Neuroscience is selected as the primary or secondary subject.

2000-level Program Requirements (Primary or Secondary)
- NESC2007 – Neuroscience Principles and Methods
- NESC2470 – Systems Neuroscience
- NESC2570 – Cellular Neuroscience
- PSYO2501 – Statistical Methods
- BIOL2020 – Cell Biology*

3000/4000-level Program Requirements (Primary)
- **Two lab classes (6-credit hours total),** selected from:
  - NESC 3044, 3051, 3137, 3161, 3165, 3370, 3371, 3440, 3775
- **Two classes (6-credit hours total),** selected from:
  - NESC 3043, 3052, 3131, 3132, 3133, 3134, 3162, 3165, 3170, 3180, 3190, 3227, 3237, 3260, 3264, 3270, 3670, 3770, 3790, 3970, BIOL3020, PHYL3420, PHAC3001, PHAC4001
- **Additional 6-credit hours** of 3000/4000-level Neuroscience courses

3000/4000-level Program Requirements (Secondary)
- **Two lab classes (6-credit hours total),** selected from:
  - NESC 3044, 3051, 3137, 3161, 3165, 3370, 3371, 3440, 3775
- **Additional 9-credit hours** of 3000/4000-level Neuroscience courses
  *(includes BIOL3020, PHYL3420, PHAC3001 & 4001)*

Pro Tip:
If you’re **passionate about two topics** and can’t decide, a double-major might be the option for you! But don’t forget, you can also minor in a subject – an option that is more flexible for scheduling.

*If primary or secondary degree also requires BIOL2020, students must take an additional 2000-level NESC credit*
Honours in Neuroscience (120-credit hour)

Admission to the Honours program requires the approval of both the Department and the Registrar. Typically, students apply in January of their 3rd year (after fall grades have been released).

**Requirements for admission:**
- Grade of B (or higher) in NESC2007
- Average of A- (or higher) in the last six (6) completed NESC courses
- If admission is delayed until the end of 3rd year, an average of A- (or higher) in the last nine (9) completed NESC courses is required

**2000-level Program Requirements**
- Identical to 120-credit hour Major in Neuroscience (see page 3)

**3000-level Program Requirements**
- PSYO3502 – Statistical Methods II (prerequisite for Honours)
- **Two lab** classes (6-credit hours total), selected from:
  - NESC 3044, 3051, 3137, 3161, 3165, 3370, 3371, 3440, 3775
- **Two classes** (6-credit hours total), selected from:
  - NESC 3043, 3052, 3131, 3132, 3133, 3134, 3162, 3165, 3170, 3180, 3190, 3227, 3237, 3260, 3264, 3270, 3670, 3770, 3790, 3970, BIOL3020, PHAC3001, PHYL3420

**4000-level Program Requirements**
- NESC4500 X/Y – Honours Thesis (full year)
- **Two classes** (6-credit hours total), selected from:
  - NESC4000, 4007, 4050, 4070, 4130, 4140, 4160, 4170, 4177, 4185, 4230, 4740
- Additional 6-credit hours of 3000/4000-level Neuroscience courses
- Honours Qualifying Exam (Thesis Defense)

**Important Note**
- University policy stipulates that Honours students must receive a grade of C or better in all program-related courses

**Pro Tip:**
If you’re interested in pursuing an Honours degree, you may want to gain **hands-on research experience** in your 3rd year, by completing an Independent Research Project (NESC3000 or 3001).
Combined Honours in Neuroscience

Students may elect to complete a Combined Honours, combining Neuroscience with another subject. **Departmental requirements for admission are identical to those for an Honours program** (see page 5). For a full list of University requirements for a Combined Honours degree, please see the Academic Calendar. If electing to complete a Combined Honours, students must select one subject as the primary and one as the secondary*. Requirements differ depending on whether Neuroscience is selected as the primary or secondary subject.

**2000-level Program Requirements** (Primary)
- NESC2007 – Neuroscience Principles and Methods
- NESC2470 – Systems Neuroscience
- NESC2570 – Cellular Neuroscience
- PSYO2501 – Statistical Methods
- BIOL2020 – Cell Biology**
- One selection from: NESC2130, NESC2140, NESC2150, NESC2160, BIOC2300, BIOL2030, PHYC2250

**3000-level Program Requirements** (Primary)
- PSYO3502 – Statistical Methods II (*prerequisite for Honours*)
- **Two lab** classes (6-credit hours total), selected from:
  - NESC 3044, 3051, 3137, 3161, 3165, 3370, 3371, 3440, 3775
- **Additional 3-credit hours** selected from:
  - NESC 3043, 3052, 3131, 3132, 3133, 3134, 3162, 3165, 3170, 3180, 3190, 3227, 3237, 3260, 3264, 3270, 3670, 3770, 3790, 3970, BIOL3020, PHAC3001, PHYL3420

**4000-level Program Requirements** (Primary)
- Identical to Honours in Neuroscience (see page 5)

**2000-level Program Requirements** (Secondary)
- If Neuroscience is the Secondary subject, students are only required to take the core 2nd-year courses (NESC2007, 2470, 2570, PSYO2501, BIOL2020)

**3000-level Program Requirements** (Secondary)
- **Two lab** classes (6-credit hours total), selected from:
  - NESC 3044, 3051, 3137, 3161, 3165, 3370, 3371, 3440, 3775
- **Additional 6-credit hours** of 3000/4000-level Neuroscience courses

* Students cannot take Psychology as their other subject.
**If primary or secondary degree also required BIOL2020, students must take additional 2000-lvl NESC credit
Minor in Neuroscience

Students majoring in a subject other than Neuroscience (with the exception of Psychology) may choose to complete a minor in Neuroscience.

To complete a minor, students must complete 18-credit hours in the subject, above the 1000-level.

Due to the restrictive prerequisites of 3rd and 4th year Neuroscience courses, many students take six 2000-level Neuroscience courses to complete their minor (excludes NESC2007, PSYO2501)

Certificates (Additional to Program)

Animal Behaviour*

The Animal Behaviour certificate is a collaborative effort between the Biology and Neuroscience/Psychology departments. Completion of the certificate will be noted at convocation and shown on a student's transcript.

Students must receive a grade of B- or higher in all courses counting towards their certificate.

Mandatory Courses
- PSYO2160 – Animal Behaviour
- PSYO2501 – Statistical Methods I (or STAT2080)
- BIOL3062 – Behavioural Ecology (or PSYO3162)
- BIOL3630 – Field Methods (or PSYO3161)
- Additional 3-credit hours of independent research

Selectives
Choose 12-credit hours from the following (6 must be at the 3000-level or above):

- ANSC2003: Companion Animal Behaviour
- PSYO2140: Learning
- PSYO2470: Systems Neuroscience
- BIOL3067: Ecology and Evolution of Fishes
- BIOL3327: Entomology
- BIOL3622: Ornithology
- BIOL/MARI3626: Field Studies in Marine Mammals
- PSYO3000/3001: Independent Research Project (Animal Behaviour topic)
- PSYO3043: Neurobiology of Learning
- PSYO3044: Lab Methods of Learning
- PSYO3162: Advanced Animal Behaviour
- PSYO3165: Neuroethology
- PSYO3170: Hormones & Behaviour
- PSYO3180: Psychoneuroimmunology
- NESC3670: Genes, Brain, Behaviour
- NESC4160: Topics in Behavioural Biology
- BIOL4060: Marine Mammalogy
- BIOL4323: Biologging & Biotelemetry
- BIOL4800/4806/4807: Special Topics (Animal Behaviour)
Certificates (Additional to Program)

**Neurotechnology**

The undergraduate certificate in neurotechnology is designed to provide foundational knowledge of this interdisciplinary area, of research and application. Including relevant topics in neuroscience, computer science, and business. The certificate will provide an understanding of how neurotechnologies can be translated into applications through training in innovation, design, and commercialization.

**Mandatory Courses**
- CSCI1100 – Computer Science I (or equivalent)
- NESC2470 – Systems Neuroscience (or equivalent)
- NESC4705 – Neurotechnology, Innovation, Commercialization, and Entrepreneurship

**Selectives**

Students must complete *at least* one course from each of the three categories (9-credit hours total):

**Neuroscience/Neurotechnology**
- PHYC2250 – Physics of Biological and Medical Technology
- NESC3137 – Research Methods in Cognitive Neuroscience
- NESC3227 – Principles of Neuropsychology
- NESC3237 – Drugs and Behaviour
- NESC4070 – Chemical Neuroanatomy
- NESC4177 – Theoretical Neuroscience
- NESC4185 – Current Advancements in Synaptic Function
- NESC4374 – Intro to Pharmacology I

**Computer Science/Informatics**
- INFX1690 – Project Management
- CSCI1101 – Computer Science II
- CSCI1106 – Animated Computing
- CSCI1107 – Social Computing
- CSCI2132 – Software Development
- CSCI4177 – Theoretical Neuroscience
- CSCI4185 – Current Advancements in Synaptic Function
- CSCI4374 – Intro to Pharmacology I

**Entrepreneurship/Innovation**
- MGMT2902 – Innovation: Design Thinking
- MGMT3620 – Used Centre Design
- MGMT3902 – Starting Lean
- MGMT3907 – New Venture Creation
- CSCI4190 – Innovation
- MGMT4901 – Managing the Venture Process

**Pro Tip:**
Although students enroll in the certificate programs in their 3rd or 4th year, it’s a good idea to think about these in your 2nd year to ensure you’ve completed any necessary 2000-level courses.

*It is the responsibility of the student to complete the required courses and notify the certificate coordinator of completion of all requirements, prior to the end of the exam period in the final year of study.*
The majority of our students tend to complete either the **Major in Neuroscience** (120-credit hour) or the **Honours in Neuroscience** program. Below is a visual representation of the required courses for both programs.

### Year 1

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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Years 3 &amp; 4 (120-credit hour major)</th>
<th>Years 3 &amp; 4 (Honours)</th>
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* Or equivalent

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<th>Years 3 &amp; 4 (120-credit hour major)</th>
<th>Years 3 &amp; 4 (Honours)</th>
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1Selected from: NESC2130, 2140, 2150, 2160, BIOC2300, BIOL2030, or PHYC2250

### Years 3 & 4 (120-credit hour major)

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2Selected from: NESC3044, 3051, 3137, 3161, 3165, 3370, 3371, 3440, 3775

### Years 3 & 4 (Honours)

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<th>Years 3 &amp; 4 (120-credit hour major)</th>
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4Selected from: NESC3044, 3051, 3137, 3161, 3165, 3370, 3371, 3440, 3775

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6Selected from: NESC4000, 4007, 4050, 4070, 4130, 4160, 4170, 4177, 4185, 4230, 4740, PHAC4001
My Plan

Year: __________
Fall term

Winter term

Year: __________
Fall term

Winter term

Year: __________
Fall term

Winter term

Year: __________
Fall term

Winter term

Notes: ____________________________________________
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Who do I speak to about...?

- General degree (e.g., BA, BSc, etc.) requirements?
  - Academic Advising (dal.ca/advising)

- Program requirements (e.g., Major, minor, etc.)?
  - Faculty Advisor (dal.ca/psychandneuro)

- Courses required to graduate?
  - Consult the Degree Audit Report System (DARS) through DalOnline and/or speak to an advisor (dalonline.dal.ca)

- Class offerings?
  - Consult the Academic Calendar (academiccalendar.dal.ca), speak to an advisor, or seek advice from other students (e.g., Undergraduate Neuroscience Society)

- Getting more involved?
  - Check out all our resources posted on our departmental website: dal.ca/psychandneuro