Neuroscience

Graduation Requirements

In addition to the requirements listed below, students must satisfy:

1. the University regulations (see the Academic Regulations of the University in this Calendar),
2. the common regulations applying to all B.Sc. students (see the Academic Regulations for the Bachelor of Science Degree).

Students enrolled in the Neuroscience and Mental Health programs should consult with the Department of Neuroscience when planning their program or selecting courses. Those enrolled in the Neuroscience Combined Honours program should consult with either the Department of Biology or the Department of Neuroscience.

Course Categories for B.Sc. Programs

The program descriptions for B.Sc. Combined Honours Neuroscience make use of the course categories defined for all B.Sc. programs (see Academic Regulations for the Bachelor of Science Degree):

- Science Faculty Electives
- Science Continuation Courses
- Free Electives

Program Requirements

Neuroscience and Mental Health B.Sc. Honours (20.0 credits)

A. Credits Included in the Major (9.5 credits)		
1. 4.0 credits in:		4.0
NEUR 1201 [0.5]	Introduction to Mental Health and Disease	
NEUR 2001 [0.5]	Introduction to Research Methods in Neuroscience	
NEUR 2002 [0.5]	Introduction to Statistics in Neuroscience	
NEUR 2200 [0.5]	Biological Foundations of Behaviour	
NEUR 3200 [1.0]	Principles of Neuroscience	
NEUR 3204 [0.5]	Principles of Psychopharmacology: From Drugs to Behaviour	
NEUR 4200 [0.5]	Seminar on Current Research in Neuroscience	
2. 1.0 credit in:		1.0
BIOL 1003 [0.5]	Introductory Biology I	
BIOL 1004 [0.5]	Introductory Biology II	
3. 1.0 credit in:		1.0
PSYC 1001 [0.5]	Introduction to Psychology I	
PSYC 1002 [0.5]	Introduction to Psychology II	
4. 1.0 credit from:		1.0
NEUR 3202 [0.5]	Sensory Processes	
NEUR 3301 [0.5]	Genetics of Mental Health	
NEUR 3302 [0.5]	Sex and the Brain	
NEUR 3303 [0.5]	The Neuroscience of Consciousness	
NEUR 3304 [0.5]	Hormones and Behaviour	
NEUR 3305 [0.5]	Immune-Brain Interactions	
NEUR 3306 [0.5]	The Neural Basis of Addiction	
5. 0.5 credit from:		0.5
NEUR 3401 [0.5]	Environmental Toxins and Mental Health	
NEUR 3402 [0.5]	Impact of Lifestyle and Social Interactions on Mental Health	
NEUR 3403 [0.5]	Stress and Mental Health	
6. 0.5 credit from:		0.5
NEUR 3501 [0.5]	Neurodegeneration and Aging	
NEUR 3502 [0.5]	Neurodevelopmental Determinants of Mental Health	
7. 1.0 credit from:		1.0
NEUR 4907 [1.0]	Honours Essay and Research Proposal	
NEUR 4908 [1.0]	Honours Research Thesis	
8. 0.5 credit in Advanced Science Faculty Electives		0.5
B. Credits Not Included in the Major CGPA (10.5 credits)		
9. 2.0 credits in:		2.0
CHEM 1001 [0.5]	General Chemistry I	
CHEM 1002 [0.5]	General Chemistry II	
PHYS 1007 [0.5]	Elementary University Physics I	
PHYS 1008 [0.5]	Elementary University Physics II	
10. 0.5 credit from:		0.5
MATH 1007 [0.5]	Elementary Calculus I	
MATH 1107 [0.5]	Linear Algebra I	
11. 1.0 credit in:		1.0
BIOL 2201 [0.5]	Cell Biology and Biochemistry	
or BIOL 2200 [0.5]	Cellular Biochemistry	
BIOL 2107 [0.5]	Fundamentals of Genetics	
12. 1.0 credit in:		1.0
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
STAT 2509 [0.5]	Introduction to Statistical Modeling II	
13. 0.5 credit from:		0.5
PSYC 2100 [0.5]	Introduction to Social Psychology	
PSYC 2301 [0.5]	Introduction to Health Psychology	
PSYC 2500 [0.5]	Foundations of Developmental Psychology	
PSYC 2700 [0.5]	Introduction to Cognitive Psychology	
PHIL 2501 [0.5]	Introduction to Philosophy of Mind	
14. 1.0 credit in Science Continuation courses (not in NEUR)		1.0
15. 1.5 credits in Approved Arts or Social Sciences		1.5
16. 0.5 credit in:		0.5
NSCI 1000 [0.5]	Seminar in Science	
or Approved Arts or Social Sciences		
17. 2.5 credits in free electives.		2.5
Total Credits		**20.0**

Notes:

1. Co-Operative Education is available for this program. Click here to go to the Co-Op section of the calendar.

2. For item 9 above, CHEM 1001 and CHEM 1002 are strongly recommended for this program. Students may

substitute CHEM 1001 and CHEM 1002 with CHEM 1005 and CHEM 1006, respectively. Students choosing CHEM 1005 and CHEM 1006 will be required to obtain a grade of B- or higher in CHEM 1006 to take BIOL 2200 and more advanced electives in BIOC and CHEM. Students completing CHEM 1005 with a grade of B- or higher are encouraged to register in CHEM 1002.

Neuroscience and Mental Health B.Sc. Major (20.0 credits)

A. Credits Included in the Major CGPA (9.5 credits)		
1. 4.0 credits in:		4.0
NEUR 1201 [0.5]	Introduction to Mental Health and Disease	
NEUR 2001 [0.5]	Introduction to Research Methods in Neuroscience	
NEUR 2002 [0.5]	Introduction to Statistics in Neuroscience	
NEUR 2200 [0.5]	Biological Foundations of Behaviour	
NEUR 3200 [1.0]	Principles of Neuroscience	
NEUR 3204 [0.5]	Principles of Psychopharmacology: From Drugs to Behaviour	
NEUR 4200 [0.5]	Seminar on Current Research in Neuroscience	
2. 1.0 credit in:		1.0
BIOL 1003 [0.5]	Introductory Biology I	
BIOL 1004 [0.5]	Introductory Biology II	
3. 1.0 credit in:		1.0
PSYC 1001 [0.5]	Introduction to Psychology I	
PSYC 1002 [0.5]	Introduction to Psychology II	
4. 1.0 credit from:		1.0
NEUR 3202 [0.5]	Sensory Processes	
NEUR 3301 [0.5]	Genetics of Mental Health	
NEUR 3302 [0.5]	Sex and the Brain	
NEUR 3303 [0.5]	The Neuroscience of Consciousness	
NEUR 3304 [0.5]	Hormones and Behaviour	
NEUR 3305 [0.5]	Immune-Brain Interactions	
NEUR 3306 [0.5]	The Neural Basis of Addiction	
5. 0.5 credit from:		0.5
NEUR 3401 [0.5]	Environmental Toxins and Mental Health	
NEUR 3402 [0.5]	Impact of Lifestyle and Social Interactions on Mental Health	
NEUR 3403 [0.5]	Stress and Mental Health	
6. 0.5 credit from:		0.5
NEUR 3501 [0.5]	Neurodegeneration and Aging	
NEUR 3502 [0.5]	Neurodevelopmental Determinants of Mental Health	
7. 1.0 credit in NEUR courses at the 2000-level or above		1.0
8. 0.5 credit in Advanced Science Faculty Electives		0.5
B. Credits Not Included in the Major CGPA (10.5 credits)		
9. 2.0 credits in:		2.0
CHEM 1001 [0.5]	General Chemistry I	
CHEM 1002 [0.5]	General Chemistry II	
PHYS 1007 [0.5]	Elementary University Physics I	
PHYS 1008 [0.5]	Elementary University Physics II	
10. 0.5 credit from:		0.5
MATH 1007 [0.5]	Elementary Calculus I	
MATH 1107 [0.5]	Linear Algebra I	
11. 1.0 credit in:		1.0
BIOL 2201 [0.5]	Cell Biology and Biochemistry	
or BIOL 2200 [0.5]	Cellular Biochemistry	
BIOL 2107 [0.5]	Fundamentals of Genetics	
12. 1.0 credit in:		1.0
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
STAT 2509 [0.5]	Introduction to Statistical Modeling II	
13. 0.5 credit from:		0.5
PSYC 2100 [0.5]	Introduction to Social Psychology	
PSYC 2301 [0.5]	Introduction to Health Psychology	
PSYC 2500 [0.5]	Foundations of Developmental Psychology	
PSYC 2700 [0.5]	Introduction to Cognitive Psychology	
PHIL 2501 [0.5]	Introduction to Philosophy of Mind	
14. 1.0 credit in Science Continuation courses (not in NEUR)		1.0
15. 1.5 credits in Approved Arts or Social Sciences		1.5
16. 0.5 credit in NSCI 1000 or Approved Arts or Social Sciences		0.5
17. 2.5 credits in free electives		2.5
Total Credits		**20.0**

Note: for item 9 above, CHEM 1001 and CHEM 1002 are strongly recommended for this program. Students may substitute CHEM 1001 and CHEM 1002 with CHEM 1005 and CHEM 1006, respectively. Students choosing CHEM 1005 and CHEM 1006 will be required to obtain a grade of B- or higher in CHEM 1006 to take BIOL 2200 and more advanced electives in BIOC and CHEM. Students completing CHEM 1005 with a grade of B- or higher are encouraged to register in CHEM 1002.

Neuroscience and Mental Health B.Sc. General (15.0 credits)

A. Credits Included in the Major CGPA (7.5 credits)		
1. 3.5 credits in:		3.5
NEUR 1201 [0.5]	Introduction to Mental Health and Disease	
NEUR 2001 [0.5]	Introduction to Research Methods in Neuroscience	
NEUR 2002 [0.5]	Introduction to Statistics in Neuroscience	
NEUR 2200 [0.5]	Biological Foundations of Behaviour	
NEUR 3200 [1.0]	Principles of Neuroscience	
NEUR 3204 [0.5]	Principles of Psychopharmacology: From Drugs to Behaviour	
2. 1.0 credit in:		1.0
BIOL 1003 [0.5]	Introductory Biology I	
BIOL 1004 [0.5]	Introductory Biology II	
3. 1.0 credit in:		1.0
PSYC 1001 [0.5]	Introduction to Psychology I	
PSYC 1002 [0.5]	Introduction to Psychology II	
4. 1.0 credit from:		1.0

NEUR 3202 [0.5]	Sensory Processes	
NEUR 3301 [0.5]	Genetics of Mental Health	
NEUR 3302 [0.5]	Sex and the Brain	
NEUR 3303 [0.5]	The Neuroscience of Consciousness	
NEUR 3304 [0.5]	Hormones and Behaviour	
NEUR 3305 [0.5]	Immune-Brain Interactions	
NEUR 3306 [0.5]	The Neural Basis of Addiction	
5. 0.5 credit from:		0.5
NEUR 3401 [0.5]	Environmental Toxins and Mental Health	
NEUR 3402 [0.5]	Impact of Lifestyle and Social Interactions on Mental Health	
NEUR 3403 [0.5]	Stress and Mental Health	
NEUR 3501 [0.5]	Neurodegeneration and Aging	
NEUR 3502 [0.5]	Neurodevelopmental Determinants of Mental Health	
6. 0.5 credit in Advanced Science Faculty Electives		0.5
B. Credits Not Included in the Major CGPA (7.5 credits)		
7. 2.0 credits in:		2.0
CHEM 1001 [0.5]	General Chemistry I	
CHEM 1002 [0.5]	General Chemistry II	
PHYS 1007 [0.5]	Elementary University Physics I	
PHYS 1008 [0.5]	Elementary University Physics II	
8. 0.5 credit from:		0.5
MATH 1007 [0.5]	Elementary Calculus I	
MATH 1107 [0.5]	Linear Algebra I	
9. 1.0 credit in:		1.0
BIOL 2201 [0.5]	Cell Biology and Biochemistry	
BIOL 2107 [0.5]	Fundamentals of Genetics	
10. 1.0 credit in Science Continuation courses (not in NEUR)		1.0
11. 1.5 credits in Approved Arts or Social Sciences		1.5
12. 0.5 credit in NSCI 1000 or Approved Arts or Social Sciences		0.5
13. 1.0 credit in free electives		1.0
Total Credits		**15.0**

Note: for item 7 above, CHEM 1001 and CHEM 1002 are strongly recommended for this program. Students may substitute CHEM 1001 and CHEM 1002 with CHEM 1005 and CHEM 1006 respectively. Students choosing CHEM 1005 and CHEM 1006 will be required to obtain a grade of B- or higher in CHEM 1006 to take BIOL 2200 and more advanced electives in BIOC and CHEM. Students completing CHEM 1005 with a grade of B- or higher are encouraged to register in CHEM 1002.

Neuroscience
B.Sc. Combined Honours (20.0 credits)

A. Credits Included in the Major CGPA (12.5 credits)		
1. 3.0 credits in:		3.0
BIOL 1103 [0.5]	Foundations of Biology I	
BIOL 1104 [0.5]	Foundations of Biology II	
BIOL 2001 [0.5]	Animals: Form and Function	
BIOL 2200 [0.5]	Cellular Biochemistry	
BIOL 2104 [0.5]	Introductory Genetics	
BIOL 3305 [0.5]	Human and Comparative Physiology	
2. 1.0 credit in BIOL, BIOC, or CHEM		1.0
3. 1.5 credits in BIOL, BIOC, or CHEM at the 3000-level or above		1.5
4. 4.5 credits in:		4.5
PSYC 1001 [0.5]	Introduction to Psychology I	
PSYC 1002 [0.5]	Introduction to Psychology II	
NEUR 2001 [0.5]	Introduction to Research Methods in Neuroscience	
NEUR 2002 [0.5]	Introduction to Statistics in Neuroscience	
NEUR 2200 [0.5]	Biological Foundations of Behaviour	
PSYC 2700 [0.5]	Introduction to Cognitive Psychology	
NEUR 3200 [1.0]	Principles of Neuroscience	
NEUR 4200 [0.5]	Seminar on Current Research in Neuroscience	
5. 1.0 credit from:		1.0
NEUR 3202 [0.5]	Sensory Processes	
NEUR 3203 [0.5]	Field Course in Animal Behaviour	
or BIOL 3605 [0.5]	Field Course I	
NEUR 3204 [0.5]	Principles of Psychopharmacology: From Drugs to Behaviour	
PSYC 3307 [0.5]	Human Neuropsychology II	
PSYC 3700 [1.0]	Cognition (Honours Seminar)	
NEUR 4001 [0.5]	Special Topics in Neuroscience (with permission)	
6. 0.5 credit from:		0.5
BIOL 3802 [0.5]	Animal Behaviour	
BIOL 4317 [0.5]	Neuroethology: The Neural Basis of Animal Behaviour	
BIOC 4007 [0.5]	Membrane Biochemistry	
7. 1.0 credit from:		1.0
NEUR 4907 [1.0]	Honours Essay and Research Proposal	
NEUR 4908 [1.0]	Honours Research Thesis	
BIOL 4907 [1.0]	Honours Essay and Research Proposal	
BIOL 4908 [1.0]	Honours Research Thesis	
B. Credits Not Included in the Major CGPA (7.5 credits)		
8. 1.0 credit in:		1.0
MATH 1007 [0.5]	Elementary Calculus I	
or MATH 1004 [0.5]	Calculus for Engineering or Physics	
MATH 1107 [0.5]	Linear Algebra I	
9. 1.0 credit in:		1.0
PSYC 3000 [1.0]	Design and Analysis in Psychological Research	
10. 1.5 credits in:		1.5
CHEM 1001 [0.5] & CHEM 1002 [0.5]	General Chemistry I and General Chemistry II	
CHEM 2203 [0.5]	Organic Chemistry I (See Note 2, below)	
11. 1.0 credit from:		1.0
PHYS 1007 [0.5] & PHYS 1008 [0.5]	Elementary University Physics I and Elementary University Physics II	
or PHYS 1001 & PHYS 1002 [1.0]	Foundations of Physics I and Foundations of Physics II	

12. 0.5 credit in:		0.5
NSCI 1000 [0.5]	Seminar in Science	
or in the Faculty of Arts and Social Sciences or Faculty of Public Affairs, not in Psychology		
13. 1.5 credits in Approved Arts or Social Sciences, not in PSYC or BIOL		1.5
14. 1.0 credits in free electives.		1.0
Total Credits		**20.0**

Notes:

1. Co-Operative Education is available for this program. Click here to go to the Co-Op section of the calendar.
2. The topic for Item 7 above must be in neurophysiology, animal behaviour, neuropsychology or a related topic.
3. For item 10 above, CHEM 1001 and CHEM 1002 are strongly recommended for this program. Students may substitute CHEM 1001 and CHEM 1002 with CHEM 1005 and CHEM 1006, respectively. Students choosing CHEM 1005 and CHEM 1006 will be required to obtain a grade of B- or higher inCHEM 1006 to take BIOL 2200 and more advanced courses in BIOC and CHEM. Students completing CHEM 1005 with a grade of B- or higher are encouraged to register in CHEM 1002.
4. For Item 11 above, students who enrol in PHYS 1001/PHYS 1002 must have completed MATH 1004 for Item 8.

Minor in Neuroscience and Mental Health (4.0 credits)

The Minor in Neuroscience is available to students registered in degree programs other than those offered by the Department of Neuroscience.

Requirements (4.0 credits):

1. 1.0 credit in:		1.0
NEUR 1201 [0.5]	Introduction to Mental Health and Disease	
NEUR 2200 [0.5]	Biological Foundations of Behaviour	
2. 1.5 credit from:		1.5
NEUR 3202 [0.5]	Sensory Processes	
NEUR 3204 [0.5]	Principles of Psychopharmacology: From Drugs to Behaviour	
NEUR 3301 [0.5]	Genetics of Mental Health	
NEUR 3302 [0.5]	Sex and the Brain	
NEUR 3303 [0.5]	The Neuroscience of Consciousness	
NEUR 3304 [0.5]	Hormones and Behaviour	
NEUR 3305 [0.5]	Immune-Brain Interactions	
NEUR 3306 [0.5]	The Neural Basis of Addiction	
3. 0.5 credit from:		0.5
NEUR 3401 [0.5]	Environmental Toxins and Mental Health	
NEUR 3402 [0.5]	Impact of Lifestyle and Social Interactions on Mental Health	
NEUR 3403 [0.5]	Stress and Mental Health	
NEUR 3501 [0.5]	Neurodegeneration and Aging	
NEUR 3502 [0.5]	Neurodevelopmental Determinants of Mental Health	
4. 1.0 credit in any 2000-level or higher NEUR course		1.0
Total Credits		**4.0**

Department of Neuroscience

Faculty of Science

NEUR 1201 [0.5 credit]
Introduction to Mental Health and Disease
Common mental health diseases; clinical symptoms of disease, genetic, developmental, experiential and environmental risk factors contributing to disease; the neurobiological basis of disease. Topics may include depression, Alzheimer's Disease, schizophrenia and ADHD.
Lecture three hours a week.

NEUR 2001 [0.5 credit]
Introduction to Research Methods in Neuroscience
A general introduction to research methodologies employed within neuroscience. Topics covered include research designs and techniques, basic descriptive statistics, and how to interpret and report research findings.
Precludes additional credit for PSYC 2000 and PSYC 2001.
Lecture three hours a week.

NEUR 2002 [0.5 credit]
Introduction to Statistics in Neuroscience
A general introduction to statistical techniques employed within contemporary neuroscience. Topics covered include basic data analysis using descriptive and inferential statistics (t-tests, ANOVA, correlation, chi-square).
Precludes additional credit for ENST 2006, GEOG 2006, PSYC 2002.
Prerequisite(s): PSYC 2001 or NEUR 2001.
Lectures three hours a week.

NEUR 2003 [0.5 credit]
Introduction to Techniques in Neuroscience
Introduction to common techniques used in neuroscience research. Brain imaging, animal behaviour, electrophysiology, immunohistochemistry and microscopy, genomics, transgenics, cell culture, and DSM-IV-based clinical assessment.
Lectures three hours a week.

NEUR 2200 [0.5 credit]
Biological Foundations of Behaviour
How molecular, cellular, and systems-level processes primarily within the brain underlie sensation, movement, motivation, emotion, learning and cognition.
Precludes additional credit for PSYC 2200.
Prerequisite(s): PSYC 1001 or NEUR 1201, or permission of the Department.
Lectures three hours a week.

NEUR 2801 [0.5 credit]
Neuroscience and Creativity
Abnormal brain function, associated with mental illness or substance abuse, has been commonly depicted in, or been the inspiration for important cultural works including movies, music, paintings and literature. The neurobiological basis of creativity in individuals with and without mental illness.
Prerequisite(s): PSYC 1001 or NEUR 1201.
Lectures and seminars three hours a week.

NEUR 3200 [1.0 credit]
Principles of Neuroscience
Core principles of neuroscience, including neural signaling, sensation, movement, neurodevelopment, neuroplasticity, neuroendocrinology, learning and memory, and other complex brain functions.
Precludes additional credit for PSYC 3200.
Prerequisite(s): Neuroscience Major or Cognitive Science Biological Foundations of Behaviour stream, and NEUR 2200 or permission of the Department.
Lectures, colloquia and seminars, three to six hours a week.

NEUR 3202 [0.5 credit]
Sensory Processes
The physiological basis of sensation. Topics include sensory mechanisms, neuropsychological bases of perception and psychological phenomena encountered in the various senses.
Precludes additional credit for PSYC 3202 and PSYC 3702.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3203 [0.5 credit]
Field Course in Animal Behaviour
Offered in the Department of Biology as BIOL 3605. Only those modules dealing with animal behaviour topics may be offered for Neuroscience credit.
Also listed as BIOL 3605.
Precludes additional credit for PSYC 3203.
Prerequisite(s): permission of the department.

NEUR 3204 [0.5 credit]
Principles of Psychopharmacology: From Drugs to Behaviour
Introduction to synaptic mechanisms and the arrangements of the transmitter-specific brain systems, followed by a discussion of neuro-pharmacological bases of normal and abnormal behaviour and of the behavioural effects of various classes of psychoactive drugs such as stimulants, tranquilizers, opiates.
Precludes additional credit for PSYC 3204.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3301 [0.5 credit]
Genetics of Mental Health
Most common mental health diseases have a genetic component. By focusing on specific diseases, this course will discuss how disease susceptibility genes are identified, and describe the genetic, genomic and epigenetic mechanisms through which DNA alterations can predispose to disease.
Prerequisite(s): BIOL 2104 and NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3302 [0.5 credit]
Sex and the Brain
Neurobiological processes behind reproductive behaviours in various animal species including humans. Evaluation of data concerning neurobiological differences between sexes, biological determinants of sexual orientation, and relating to neurobiology of sex disorders.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3303 [0.5 credit]
The Neuroscience of Consciousness
Consciousness remains one of the least understood aspects of the nervous system. This course explores neural mechanisms underlying consciousness, changes in consciousness associated with sleep, coma, vegetative states, drugs, and other stimuli, and considers the evolutionary basis of consciousness, and its relationship with awareness.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3304 [0.5 credit]
Hormones and Behaviour
The effects of hormones throughout life at all levels of the nervous system. The role of hormones in mediating behaviours that are both basic (feeding, reproduction and social interactions) and complex (motivation, emotion, learning and memory).
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3305 [0.5 credit]
Immune-Brain Interactions
This course will discuss growing evidence of communication between the brain and the immune system, and of the messengers mediating the interaction. We will discuss how disturbances of immune-brain signaling can lead to disease (multiple sclerosis, Parkinson's) and to changes in mood and cognition.
Prerequisite(s): NEUR 3200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3306 [0.5 credit]
The Neural Basis of Addiction
How substance and behavioural addictions impact neural function to ultimately lead to the neuropathology of addiction in vulnerable populations. The neurobiological mechanism of action of each drug class; contemporary neurobiological theories of addiction.
Prerequisite(s): NEUR 2200 and third-year standing.
Lecture and seminar three hours a week.

NEUR 3401 [0.5 credit]
Environmental Toxins and Mental Health
Exposure to environmental toxins from the air, water or food can interfere with neuronal function, alter neurodevelopment, and damage the brain. This course will explore associations between toxins and diseases such as Parkinson's disease, multiple sclerosis and depression, focusing on mechanisms underlying development of pathology.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3402 [0.5 credit]
Impact of Lifestyle and Social Interactions on Mental Health
Healthy lifestyle choices and positive social interactions can reduce the incidence of pathological conditions such as depression, obesity, cardiovascular disease and impaired immunity. This course focuses on psychosocial and neurobiological mechanisms that underlie the relationship between lifestyle, social interactions and health.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3403 [0.5 credit]
Stress and Mental Health
Stressful events can have profound repercussions on physical and psychological well-being. This course examines the psychosocial and biological processes by which stressors predispose to both physical (immune-related disorders, diabetes, heart disease) and psychological (acute stress disorder, posttraumatic stress disorder, depression, anxiety) pathologies.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3501 [0.5 credit]
Neurodegeneration and Aging
Neurodegeneration is particularly acute in the aging population, and is characteristic of diseases such as Alzheimer's, Parkinson's, multiple sclerosis and Huntington's disease. This course will explore mechanisms underlying neurodegeneration, plus recent advances aimed at the restoration of nervous tissue, potentially curing these pathologies.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3502 [0.5 credit]
Neurodevelopmental Determinants of Mental Health
Development of the human brain, the generation and differentiation of the various cell types, and the formation of the vast network of neural connections. How neurodevelopmental dysregulation can result in pathologies including dyslexia, ADHD, schizophrenia and autism.
Prerequisite(s): NEUR 2200 and third-year standing.
Lectures and seminars three hours a week.

NEUR 3999 [0.0 credit]
Co-operative Work Term

NEUR 4001 [0.5 credit]
Special Topics in Neuroscience
Each section of NEUR 4001 deals with a different topic. Topics change yearly. Students may register in more than one section of NEUR 4001 but can register in each section only once.
Prerequisite(s): NEUR 3200 and fourth year standing, or permission of the Department.
Lectures three hours a week.

NEUR 4200 [0.5 credit]
Seminar on Current Research in Neuroscience
A seminar discussing how research on brain structure and function can lead to development of novel pharmacological, surgical and behavioral therapies of mental health diseases. Students will gain insight into the relationship between clinical observations and hypothesis-driven research into the biological basis of disease.
Precludes additional credit for PSYC 4200.
Prerequisite(s): NEUR 3200.
Seminar three hours a week.

NEUR 4801 [0.5 credit]
Neuroethics
Ethical issues of key importance to current neurobiological research. Topics may include the use of animals in research, stem cell research, genetic diagnosis and gene therapy, neuroimaging, and the effect on identity and autonomy of manipulations such as psychopharmaceuticals and psychosurgery.
Prerequisite(s): NEUR 3200.
Lectures and seminars three hours a week.

NEUR 4900 [0.5 credit]
Independent Study
A reading or research course for selected students who wish to investigate a particular topic of interest. Normally students may not offer more than one credit of independent study in their total program.
Prerequisite(s): third- or fourth- year standing and permission of the Department.

NEUR 4907 [1.0 credit]
Honours Essay and Research Proposal
An independent essay based critical review and research proposal on a topic in neuroscience, using library resources, under the direct supervision of a Faculty advisor. Evaluation is based on a written report.
Precludes additional credit for NEUR 4908.
Prerequisite(s): fourth-year standing in an Honours Neuroscience program and permission of the Department.

NEUR 4908 [1.0 credit]
Honours Research Thesis
An independent research project undertaken under the direct supervision of a faculty advisor typically from the Department of Neuroscience. Evaluation is based on a written report and poster.
Precludes additional credit for NEUR 4907.
Prerequisite(s): fourth-year standing in an Honours Neuroscience program, minimum CGPA of 9.0 and permission of the Department.

Summer session: some of the courses listed in this Calendar are offered during the summer. Hours and scheduling for summer session courses will differ significantly from those reported in the fall/winter Calendar. To determine the scheduling and hours for summer session classes, consult the class schedule at central.carleton.ca

Not all courses listed are offered in a given year. For an up-to-date statement of course offerings for the current session and to determine the term of offering, consult the class schedule at central.carleton.ca