2023-24 Edition

NUM Survival Guide

Your Guide to McGill's Neuroscience Courses

Disclaimer: These course reviews have been written by students in the program. Though we ask our writers to provide a balanced review of the class, these entries are inherently subjective. If you strongly disagree with anything written here or would like to suggest an edit, please write to us at num@susmcgill.ca

For more information on these courses, we direct you to the SUS Science Syllabus Repository or the McGill eCalendar.

Credits

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Introduction

A Guide to this Guide

Introduction

Every year we must make tough decisions on what courses we want to devote our time and attention to, and deciding which ones to take can be tricky. While the official course descriptions can provide you with an idea of what is taught in the class, it tells you little about the actual course experience. To help fill this gap, we have created the NUM Survival Guide. We have recruited actual students of McGill's Neuroscience Program to share their experiences with the courses and to give you some tips for success. Not every course is reviewed here, but we have tried to cover the most important and enjoyable courses within the program.

What this is not

While we have tried to ensure everything in this guide is accurate, it is not and should not be used as a replacement for your advisor or the official program material. Students of the Neuroscience program wrote this guide and the opinions expressed within it are of theirs alone, which are not necessarily reflective of the opinions of McGill University. The opinions may also vary from those of other students who have taken the class, so don't take these reviews as definitive. Before making any important course decisions, please talk to your advisor to ensure you are getting the best advice. That said, we still hope you find it useful.

How to navigate the guide

The entries are listed in alphabetical order. For quick navigation, use command + F (or ctrl + F) and type in the class you're looking for. ***New this year, the date that the entry was last updated is included.*** Please note, however, that course formats sometimes change from year-to-year, and the grading schemes or the professors may be different.

About Textbooks

In this guide, we have tried to indicate how important the textbook is for each course. Often textbooks are useful for contextual information but aren't needed for the actual midterms and final, so we have tried to indicate when that is the case. Buying used textbooks can also save you money, so check out McGill Classifieds or the various used bookstores around McGill—they may not have the latest editions though.

About Prerequisites

If you really want to take a course but you don't have the prerequisites, don't give up! Often professors will let you register for classes if you express enough interest. Many profs know that neuroscience students are willing to put in extra effort to make up for their lack of background knowledge. Just know that you may be behind relative to other students in the class, but that you're keen to put in the effort.

ANAT 321

Circuitry of the Human Brain

Instructor:
Prof. David Ragsdale
Semesters:
Fall

Course Overview

The course focuses on how neuronal systems are designed to subserve specific motor, sensory, and cognitive operations as well as some modern topics in neuroscience like brain imaging and consciousness. With Professor Ragsdale, the class is NSCI200/201 lite, presenting a simplified version of the material covered in these courses. 3 hours of lectures per week.

Method of Evaluation

40% midterm + 60% final. Lecture-based midterm and final are entirely multiple choice, and reflective of the provided practice problems.

The Experience

Dr. Ragsdale teaches ANAT 321 as a conceptual anatomy class. He is an engaging lecturer, and his neuroanatomy explanations are very elegant. The pace of the course can be a bit slow, and Dr. Ragsdale is fine with not being able to cover all the material (you won't be tested on this material). This course is a nice overview of the organization of the nervous system and is taught at a level of detail that is less than what neuroscience students will already know coming into the course. It is still a very interesting class. Evaluations for the class were straightforward; as a result, the class typically has an A- average.

Tips for Success

The midterm and final exams for the course are straightforward multiple choice on concepts about the nervous system, however Professor Ragsdale is under pressure from faculty to lower the class average in future years and in Fall 2017 he did succeed at adding in a few tougher, less fact-based questions. In Fall 2018, he also added in a few harder questions that require deeper understanding of lecture material and less rote memorization than usual. For Fall 2021, all the exams were very straightforward! Understand the overlapping concepts he continually stresses in class as well as the facts and you'll be good to go!

Prerequisites:
ANAT/BIOC 212 or BIOL 201; and one of PHGY 209, NSCI 200 or PSYC 211; or permission of instructor

Class Size: ~280

Textbook:
None.

Lecture Recordings:
Yes! Slides are posted in advance.

Entry Last Updated in October 2023

BIOC 212

Molecular Mechanisms of Cell Function

Course Overview

An introductory course describing the biochemistry and molecular biology in selected key functions of animal cells, including gene expression, mitochondrial production of metabolic energy, cellular communication with the extracellular environment and regulation of cell division.

Method of Evaluation

In-person: Non-cumulative, multiple choice 46% midterm and 54% final.

The Experience

All of the lecturers are quite good. They are experts in their field (ex. Arnim Pause is a cancer researcher and teaches the cancer part of the course) and generally clear with their speaking and slides. This course consists of a lot of work and memorization. The material is completely from lecture, but it is very thorough, especially the material for the first midterm which is quite difficult and detail-oriented while the final is less so.

Tips for Success

Making clear notes is key. This may be true for any course, but BIOC 212 throws a lot of information at you. It is in your best interest to keep that information understandable to you. The professors provide questions during the lecture that you can do after class. These help to prepare for the exam, along with looking over the textbook images with their explanations. The exam is non-cumulative, which really helps with studying and understanding.

BIOC 212 vs. BIOL 201

BIOL 201 seems to have a greater emphasis on cell cycles and specifics of metabolism (glycolysis, citric acid cycle) and BIOC 212 has a greater emphasis on specific proteins and their interactions (heat shock proteins, how cancer affects cell growth) as well as pathways and cascades. Different students have different opinions on both courses, but most agree that both courses are quite challenging. BIOC 212 is non-cumulative. BIOL 201 is cumulative with 2 midterms and a final all with cheat sheets.

Instructors:
Robert Kiss, Thomas Duchaine, Arnim Pause, Dieter Reinhardt, Maria Ugalde

Semester: Winter

Prerequisites:
BIOL 200

Class Size: 250

Textbook:
Molecular Cell Biology, 5e (Lodish)
Supplementary; all testable information is provided in lecture.

Lecture Recordings:
Lectures are live on Zoom and recorded, slides are posted

Entry Last Updated in March 2023

BIOC 311

Metabolic Biochemistry

Course Overview

The course examines the material covered in BIOC 211 and BIOL 201 in greater detail, and with a higher degree of integration. The global goal of the course is to equip students with a thorough understanding of integrated metabolism by focusing on individual systems of catabolism and anabolism for each macromolecule group (carbohydrates, lipids, nucleotides and amino acids) and then by further developing how these networks interact with each other. Topics include glycolysis, gluconeogenesis, the pentose phosphate pathway, glycogen, TCA Cycle, ETC, anaplerotic/ cataplerotic reactions, fatty acid synthesis/degradation, ketogenesis, cholesterol, nitrogen and urea cycles, amino acids, nucleotides as well as the hormonal and allosteric regulation of each of the aforementioned subjects.

Method of Evaluation

In-person: Midterm (40%) and final (60%). Short answer and multiple choice questions.

The Experience

The individual concepts of the course are not overly challenging, however the course requires a very high level of understanding, the ability to synthesize information and the application of your knowledge. There is also a high degree of memorization required as the questions will reference specific enzymes/pathways. The multiple choice questions on the quizzes and exercises are a combination of type A and B as well as some "select all that apply" style questions. The short answers are often application questions which were not gone over in lecture but are within the reach of the information and may resemble the questions found in the module's Sample Problems. They demand critical thinking and the ability to combine concepts, especially the final, which was entirely made of short or long answers with no multiple choice. For the final exam they also provided a sheet with some important pathways (ie: glycolysis and Krebs cycle) however it only had a few important big picture pathways, whereas you are expected to know many more and in more depth.

Tips for Success

Understanding how the various processes and pathways work will be very helpful on the exam. However, also make sure to memorize all of the names or acronyms as it will be nearly impossible to correctly answer the questions without knowing the specific role of the enzymes/proteins referenced even if you have a thorough understanding of the concepts. Everything you need to know is theoretically in the slides, you just need to make sure you understand it and that you can apply it to novel situations. Also be sure to meticulously do the Sample Problems and be sure to understand how to solve them before the quizzes.

Instructors:
Maxime Denis, Lawrence Kazak, Kalle Gehring, Vincent Giguere
Semester: Fall

Prerequisites:
BIOL 200, BIOL 201 or BIOC 212, CHEM 222

Class Size: ~400

Textbook:
"Fundamentals of Biochemistry" 2016 (5th Edition) D. Voet,J. Voet & C. Pratt, Chap. 14 – 23
Recommended; all testable information is provided in lecture.

Lecture Recordings:
Lectures are recorded, and slides are posted.

Entry Last Updated in March 2023

BIOL 200

Molecular Biology

Instructors:
Kenneth Hastings, Paul Lasko, Rodrigo Reyes-Lamoth, Richard Roy

Semesters:
Fall

Course Overview

The physical and chemical properties of the cell and its components in relation to their structure and function. Topics include molecular genetics and genomics, protein structure, enzymes and enzyme kinetics; nucleic acid replication, transcription and translation; the genetic code, mutation, recombination, and regulation of gene expression.

Method of Evaluation

In-person method: 6 Quizzes (lowest score dropped) (10%), Midterm (25%), Final (65%)

The Experience

Professor Hastings is an interesting lecturer and is very passionate about biology. The material will sometimes feel dry but make sure to pay close attention to the points the professors emphasize for these are the ones that come up often on exams. Nevertheless, he is able to explain somewhat difficult concepts very succinctly and clearly. Hastings also responds very enthusiastically to any questions. For his portion, the textbook is not required at all. Lasko's section is only about 3 lectures, but he is truly an engaging lecturer (and his exam questions are straightforward). Reyes comes in for a few more lectures as well (and his exam questions can be a bit confusing), but the bulk of the course is taught by Hastings and Roy. Professor Roy's questions were, for most students, the hardest questions (and use a lot of academic jargon). They require critical thinking skills and are not based on memorization. Make sure to read the lengthy questions thoroughly before answering, because the details could be worth a lot of points. The difficulty of quizzes will depend on which professor writes them.

Tips for Success

The key to success for this class is re-watching the lecture recordings. No matter how minute it is, every detail brought up in lecture might end up on the midterm and/or final. This class definitely requires a lot of memorization, but in order to succeed, try to understand the fundamental processes first, then regurgitate the smaller details. Also, make sure you don't lose the rope connecting material between videos and professors. More clearly, a question on a quiz supposedly covering Professor Roy's material could require you to use something you learned in Professor Hastings' lectures. So make sure you understand the link between different topics, because a question could need you to put things together!

Prerequisites:
BIOL 112 or equivalent

Class Size: ~600

Textbook:
Molecular Cell Biology 8e (Lodish) Used Textbook may be purchased for ~60$ and might also be found online. Not necessary for success in the class but can aid learning.

Lecture Recordings:
Lectures are recorded and slides are posted.

Entry Last Updated in October 2023

BIOL 201

Cell Biology and Metabolism

Instructors:
Gary Brouhard
Semester:
Winter

Prerequisites:
BIOL 200

Class Size: 600+

Textbook:
Molecular Cell Biology, 8e (Lodish) – not required, but the professor recommends these readings because they are more challenging than the lectures.

Lecture Recordings:
Lectures are recorded and slides are posted

Entry Last Updated in October 2023

Course Overview

This course introduces the student to our modern understanding of cells and how they work. Major topics to be covered include: photosynthesis, energy metabolism and metabolic integration; plasma membrane including secretion, endocytosis and contact mediated interactions between cells; the cytoskeleton, including cell and organelle movement; the nervous system; hormone signaling; the cell cycle; biomolecular condensates.

Method of Evaluation

2 Midterms (25% each), 15% Quizzes and Activities (Students can choose from a piece of art, baking, and 3-D printing workshops), Final exam (35%). Evaluations are all in short answer format (1 word-4/5 sentences). Midterms and Finals are allowed cheat sheets! **Important note:** Gary Brouhard is on sabbatical in the 2023-2024 year, so the instructor and methods of evaluation are subject to change!

The Experience

BIOL 201 is a very interesting course that is quite a bit different from the experience in BIOL 200. Dr. Brouhard is engaging and inspiring and emphasizes application of concepts; he doesn't focus heavily on the proteins and complex names that the processes he discusses rely on. He is an amazing lecturer that goes over concepts at a reasonable rate, has obvious passion for the subject that he teaches, and is interested in the success of his students. All slides and lectures are posted online if you can't make it to class. The final section of the class overlaps quite a bit with NSCI 200/201, which can prove helpful. Also, Dr. Brouhard will curve the final grades if needed (sometimes the first midterm comes as a bit of a shock).

Tips for Success

Brouhard claims that any exam question that can be answered by Google is a bad question. He focuses on the concepts discussed in class and pushes you to think about how the components of the cellular system interact. Many of the questions require consideration of what might happen if the cellular systems are perturbed. Knowing the facts does serve as a tool for understanding how different cellular processes fit together. The best approach is to focus on understanding the problems that the cell is trying to solve. Learning the concepts takes time and the crib sheet, though helpful in reminding you about a protein name when trying to answer a short-answer question, will not be sufficient to answer the complicated conceptual questions he will inevitably ask. You will come out of this course having learnt a lot about how to think critically and apply knowledge in order to make conclusions given limited information.

BIOL 202

Basic Genetics

Instructors: Paul Lasko, Daniel Schoen, Laura Nilson, David Hipfner, Nam Sung Moon (Winter); David Dankort, (Summer)
Semesters: Winter and Summer

Course Overview

This course is an applied approach to learning about the genetics of organisms. How are traits inherited? What regulates gene expression? How do genes interact within the organism? How are genetics analyzed at the population and ecological level? How can genetics help us understand cancer, its inheritance, and its pathogenesis? Finally, how does gene expression change through organismal development and how does the environment influence this? The first half of the course is taught by Dr. Lasko and Dr. Schoen and is assessed by a problem-solving-based midterm exam. The second half of the course is taught by Dr. Nilson, Dr. Hipfner and Dr. Moon and ends with a final exam that includes pre-midterm material.

Method of Evaluation

Self-assessment exercises (10%, 2% each), short answer midterm (30%) and a cumulative final (60%).

The Experience

BIOL 202 is not all about memorization; it requires you to memorize a few details, but the application of knowledge to actual problems and experiments is more important. While the lectures present key examples and basic concepts, solving problems often requires an extrapolation of what was covered in lecture. This course can be challenging, as it involves a lot of thinking and problem solving, but it is also a refreshing break from pure memorization classes. While the midterm material is more straightforward application of probability and Mendelian genetics, the final brings in the added complexity of molecular genetic concepts and cancer genetics, which can prove to be quite tricky.

Tips for Success

Do all the assigned practice problems, even the ones you think are easy. You can find practice material in the textbook, conferences, and in lecture slides. Often, it is only through doing the practice questions that you realize you do not truly understand a concept. In addition, the practice problems cover intricacies of the concepts that are not clearly focused on during lectures. Aim for a high mark on the midterm; it provides a cushion for the tougher final. The final exam is a little bit more similar to BIOL 200 in how it tests a lot of molecular concepts and requires more memorization than seen in the midterm exam. A more strategic approach to memorizing that synthesizes small details with larger concepts will lend well to preparing for the final.

Prerequisites:
BIOL 200

Class Size: 600

Textbook:
Introduction to Genetic Analysis, 11th edition (Griffiths et al.) + Solution Guide (Also available as a e-book)
Highly recommended. The problems provide a lot of the practice that is necessary to develop a familiarity with genetic analysis and the chapters assigned as readings help clarify material.

Lecture Recordings:
Lectures are on zoom, recorded and slides are posted.

Entry Last Updated in March 2023

BIOL 306

Neural Basis of Behaviour

Instructors:
Joseph Dent, Jon Sakata

Semesters:
Fall

Course Overview

The first part of the course, taught by Professor Dent, covers cellular neurophysiology very similar to Professor Ruthazer's section of NSCI 200 (but make sure you focus in class, as his content is not easy). Keep your NSCI 200 notes – they may prove useful in this course! Professor Sakata focuses primarily on the sensory (auditory, visual, multimodal, etc.) and motor systems, how they translate into behaviour, and their neural bases. The last part of the course, taught by Professor Dent, is about genes and behaviours such as language, circadian rhythms, sleep, aggression, and sexual behaviour.

Method of Evaluation

Online exercises covering the neurophysiology section (2%), online quizzes covering the neurophysiology section (12%; 6% each), 3-2-1 assignments (10%), midterm (28%), final exam (33%), term paper (15%). Note: On the quizzes if you receive a passing grade of ≥ 70%, you will not be able to retake the quiz.

The Experience

This course presents a unique perspective in the neuroscience degree. It focuses on animal physiology to study animal physiology – rather than to primarily explain human physiology, although this is touched on in the genes and behaviours sections at the end of the course. Dr. Dent's neurophysiology quizzes are mainly calculation- and graph-based and on the electrophysiological properties of neurons. The exams are more memorization/evidence-based. A lot of the exam questions emphasize what experiments/evidence led to certain conclusions. Compared to PHGY 314, there is much less information to memorize. There is a lot of overlap between BIOL 306 and NSCI 201, and some overlap with PHGY 311 (with Dent's first section).

Tips for Success

For the electrophysiology section, practice questions Prof. Dent gives in class are very different from his quizzes, but they are good practice for understanding the concepts. Dent's content is challenging and may require watching the lecture recordings after attending the in-person class. For the neuroethology and genes and behaviour material, Q-and-A-style study notes are very helpful. The professors do a good job of citing the research they cover in class, so if there's an important experiment you don't understand, look it up! Make sure you thoroughly understand the purpose and associated concepts for each animal model. Go over lectures shortly after they've been given. For Sakata's section,

Prerequisites:
PHYS 102 or PHYS 142 or CEGEP Physics and one of the following: BIOL 201, ANAT 212, BIOC 212 or NSCI 200

Restrictions:
BIOL 306 and PHGY 314 cannot be both taken for credit.

Class Size: ~200

Textbook:
N/A, but extra resource links as well as practice questions are provided.

Lecture Recordings:
Pre-lecture videos for Sakata's section are posted; lecture recordings are uploaded; slides are posted.

Entry Last Updated in October 2023

BIOL 309

Mathematical Models in Biology

Course Overview

Application of finite difference and differential equations to problems in cell and developmental biology, ecology and physiology. Qualitative, quantitative, and graphical techniques are used to analyze mathematical models and to compare theoretical predictions with experimental data. Topics include chaos and bifurcations, Boolean networks, cellular automata, fractals, and more.

Method of Evaluation

Assignments (20%), midterm exam (20%), term project (20%), final exam (40%).

The Experience

BIOL 309 is a very interesting course with fascinating mathematics. Though the material may at first seem confusing and somewhat daunting, the pace moves relatively slowly and there are many resources (textbook, tutorials, office hours) to help you better understand the material. Professor Bub can be slightly disorganized at times, but he keeps class interesting and is extremely knowledgeable on the subject. The computer simulations shared in class also offer insight as to how complicated mathematical formulas relate to common biological systems. After COVID, the course uses a semi-flipped classroom approach—class time is usually reserved for problem solving.

Tips for Success

Taking the course as a U1 student can be helpful, as calculus will be fresh in your mind. Do assignments and practice with previous exams. Go to tutorials, they are very helpful. Find a study/assignment group to tackle tougher problems! Students are encouraged to work together on the assigned homework problems as they are very challenging. Try to do as many practice problems as you can. Pay attention to the models and simulations presented in class; the exams may require you to explain them!

BIOL 309 vs MATH 222

Many students may find this to be a more relaxed and more neuroscience-relevant alternative to Calculus 3. You'll leave the course with a different perspective on mathematics and computation in neuroscience. In addition, many of the concepts are related to biological and ecological systems, which may interest neuroscience students more as opposed to pure mathematics. MATH 222 is a direct continuation of MATH 141 whereas BIOL 309 is a far more unique course. Each class is challenging in its own way with heavy workloads, but BIOL 309 has a more diverse grading scheme that allows for more opportunities to show your learning beyond a midterm and an exam. A major difference between these two courses (beyond the math content itself) is the written component of BIOL 309 where students can choose to critique a paper on a mathematical model or create a model of their own.

Instructor:
Professor Gil Bub
Semesters:
Fall

Prerequisites:
BIOL 200, BIOL 201 (or ANAT 212/BIOC 212); or BIOL 219
One year of calculus

Class Size: ~50

Textbook:
Understanding Nonlinear Dynamics (Daniel Kaplan and Leon Glass)
$50 used and available for free as a PDF. Absolutely essential and very helpful. The concepts covered in class follow the textbook very closely.

Lecture Recordings:
No lecture recordings. Lecture slides are posted, and most of the models shown in class are on Dr. Bub's lab site.

Entry Last Updated in October 2023

BIOL 506

Neurobiology of Learning

Course Overview

This course explores the neurobiological basis of learning and memory, from molecules to circuits. The focus of BIOL 506 is on the synaptic, cellular, and circuit-level processes that support learning, in the context of different brain regions and forms of learning. The course is divided into three sections. The first section is lecture-based, providing a framework of the current state of knowledge in the field and ongoing research at McGill. The second section involves critical analysis and presentation of recent literature by students. In the third section, students identify gaps in current knowledge and propose research to address them. The first section of the course comprises traditional lectures while the following two sections consist of student presentations. Examples of lecture topics include mechanisms of plasticity (hippocampus, amygdala, cerebellum); adaptive developmental plasticity; maintenance of synaptic changes underlying memory; unconventional NMDA receptor signaling; structural plasticity in the developing visual system; neuron-glia interactions in developing brain circuits; and homeostatic plasticity.

Method of Evaluation

Midterm exam after the lecture section (20%); presentation on a selected research paper (30%); research proposal (40% with 15% presentation and 25% written proposal); participation (10%)

The Experience

Dr. Suvrathan organized and taught this course with enthusiasm and expertise that made the class experience very rewarding. BIOL 506 is an enjoyable course in terms of both structure and content. The aims of the course are to enable students to understand key concepts in the field of learning (from a historical perspective to recent discoveries and current theories); to know how different circuits within the brain implement learning; to think about learning with a broad perspective; to critically evaluate current literature; and to design research addressing an open question in the field of learning. The course is successful at achieving these aims while promoting concept-based learning, independent thought, and teamwork among students.

Tips for Success

For the lecture section, taking notes and understanding the conceptual and mechanistic aspects of the class material are helpful in preparing for the midterm (in Fall 2020, available for 24 hours with a 3-hour time limit once opened). The midterm is graded very fairly and encourages students to think critically and creatively about the material. For the presentations, take advantage of the opportunity to select a paper and topic that interests you!

Instructor:
Dr. Suvrathan; several guest lecturers

Semesters:
Fall

Prerequisites:
BIOL 306 or NEUR 310 or NSCI 200 and NSCI 201 or PHGY 311 or PHGY 311, or permission of instructor

Class Size: 18

Textbook:
There is no textbook. Optional reading materials are provided.

Lecture Recordings:
Lectures are recorded and posted on MyCourses.

Entry Last Updated in March 2023

BIOL 588

Advances in Molecular/Cellular Neurobiology

Instructors:
Kenneth Hastings & Yang Zhou
Semesters:
Fall

Course Overview

This course discusses fundamental molecular mechanisms underlying the general features of cellular neurobiology. Discussed topics include genetic models and methods, vesicle trafficking, neuronal differentiation, and neural circuits. Weekly seminars facilitate critical discussions on recent literature in the field.

Method of Evaluation

In-class Participation (75%), Final Test (25%).

The Experience

While Dr. Hastings and Dr. Zhou lead the class, they are joined by the phenomenal Dr. Arjun Krishnaswamy, Dr. Peter McPherson, and Dr. Jean-Francois Poulin for 2 week sections on their areas of expertise. You'll have a 1.5 hour lecture each week followed by a 1.5 hour seminar a few days later where you'll discuss a recent paper related to the lecture. Not only will you learn a great deal during these seminars; they are also incredibly fun and engaging. This class has been both the most enjoyable course I've taken in my undergrad and the one where I developed my skills the most. It was a great introduction to graduate-level courses as Dr. Hastings and Dr. Zhou teach you how to excel in a seminar/discussion format and provide a lot of constructive feedback. Even if the covered topics aren't of interest to you, you can still benefit greatly from taking BIOL 588. The prerequisites are completely unnecessary, as I did just fine without having either of them (though, I had taken NSCI 200 and NEUR 310 instead).

Tips for Success

While the class content is very manageable, it requires you to constantly be on-top of your lectures and readings. Make sure you leave adequate time to read and understand each paper. Take notes while you do so about what you'd like to discuss! Professor Hastings and Zhou make their expectations very clear for the paper discussions and meeting those will yield a good grade. While it may be challenging at first, try to think critically about the paper and come to class with some limitations of the paper to discuss. It will show you have a good understanding of the paper presented and the field. Also, don't be scared to ask questions!You'll learn so much from both your professors and peers (especially the grad students) by asking questions about things you don't understand or haven't seen before. The final test was very fair and similar to what you'd see in other neuroscience courses you've likely already taken like NSCI 200 and NEUR 310. Study well, but there's no need to stress.

Prerequisites:
BIOL 300 and BIOL 306 or permission of instructors.

Class Size: 10-20

Textbook: None

Lecture Recordings:
Professors recorded lectures on their own laptops and uploaded them. As such, not all lectures were recorded properly, but most were.

Entry Last Updated in March 2023

CHEM 212

Organic Chemistry 1

Instructor:
Danielle Vlaho, Pallavi Sirjoosingh, Laura Pavelka
Semesters:
Fall/Winter/Summer

Prerequisites:
CHEM 110 and 120

Class Size: 550

Textbook:
N/A – lots of practice provided (Profs are passionate about making materials accessible to all)

Lecture Recordings:
Lectures are recorded and slides are posted. Everything is on myCourses.

Entry Last Updated in March 2023

Course Overview

The main focus of the course is understanding how chemicals behave in order to predict reactivity as well as how chemicals transform Properties, Reactivity and application of hydrocarbon and hydrocarbon derivatives (i.e alkyl halides) are studied as well as nomenclature, stereochemistry and modern concepts of bonding. Multiple different mechanism pathways are learnt including radical halogenation, substitution, elimination and aromatic reactions.

Method of Evaluation

2 x 15% online Midterms via Crowdmark; 30% Final; 20% Laboratory; 5% Tutorial participation (attend ⅝ and peer feedback); 5% Tutorial presentation (twice), 10% quizzes (11 quizzes, drop worst). 4 Bonus surveys for 1%. The grading scheme is flexible – you can choose not to do Tutorials, in which case the 5% moves to your quizzes. This is the evaluation scheme for online Fall 2022 – this scheme may change in the winter and summer semesters. The grading scheme really allows for the success of students in the class.

The Experience

All professors are extremely organized and dedicated to the success of their students. The class uses a flipped-classroom approach with concept videos preceding the week's in-class practice and tutorial. The professors thoroughly explain concepts in class, provide useful flowcharts/summaries and tools for problem solving, and allow time for guided practice in class. They all are very clear and passionate about chemistry. They go above and beyond in providing resources which will help students excel such as tutorials, an online discussion board, practice problems, and organic bytes (pre-lecture learning modules). Note that the lab has its own syllabus!

Tips for Success

This course is challenging but very rewarding if you dedicate time to doing many practice problems. With the resources available it is very possible to excel in the course. The key to success is to practice often and seek out help if needed. Watch the concept videos, do all the problem sets, attend lectures, and do the practice finals. The labs take a significant amount of time but are marked fairly and tend to help students understand (and the experiments are fun in the super state-of-the-art lab facility). The midterms and final are reflective of the example problems (and practice midterms). Overall, organic chemistry is about solving puzzles and following patterns. By doing lots of example problems you can become familiar with the different mechanisms so the exams won't come as a surprise.

CHEM 222

Organic Chemistry 2

Course Overview

The course begins with an overview of the structure of organic molecules. Mass spectrometry, infrared spectroscopy, and nuclear magnetic resonance are covered. The course then moves on to explore the chemical properties of various functional groups like alcohols, ethers, aldehydes, ketones, carboxylic acids, amines and more.

Method of Evaluation

2 Midterm/Assessments (20% each), Final Exam (25%), Lab Component (20%), Quizzes (5%, 12 with the lowest dropped), Tutorial Attendance 5%, Presentation during tutorials 5%. These grading schemes are flexible, which means you can change these during the first weeks of the course. Breakdown of the lab (20% in total): Assignment (1%), 4 Lab reports (12%), pre-lab quizzes (2%), final quiz (3%), prep & performance (2%) (pre-lab quizzes must be completed before lab).

The Experience

The course focuses on creating a practical understanding of the chemistry covered. Almost all questions are based on problem solving and mechanisms. Dr. Pavelka's questions are all long answers on midterms and exams and MCs on the quizzes. All questions on the exams ask to design a reaction mechanism to generate the final product from a given reactant. Lab hours usually take 2-3 hours, but the preparation and lab reports can take up to 10 hours in total for each.

Tips for Success

Practice is key! Many previous exams and practice questions are posted; do them until you understand the material. For the weekly quizzes, try to do all the problems posted on myCourses. Organic chemistry requires both memorization and problem solving so make sure to study the class notes but don't forget to do lots of practice problems. Keep up with the material during the semester so that you have enough time to prepare for the weekly quizzes, and make sure you understand every question you get wrong. Also, pay attention to the examples that the TAs present during the tutorials, they could be very similar to the ones on exams! Also, lab reports could take a lot of time to complete, so do them right after the lab when you have the best memory of the process and mechanisms. I also suggest reading and doing the problems provided in the textbook to get a more thorough understanding.

Instructor:
Laura Pavelka (Lecture) Dr.Vlaho (Lab)
Semesters:
Fall, Winter, Summer

Prerequisites:
CHEM 212 or equivalent

Class Size: 600

Textbook:
Organic Chemistry (Solomon and Fryhe)
Supplementary, but useful for practice questions and if you want more a theoretical understanding of the material covered in class.

Lecture Recordings:
Yes. Slides are also posted online

Entry Last Updated in March 2023

COMP 202

Foundations of Programming

Course Overview

In COMP 202, you learn how to program using Python as your first programming language. The basics of creating loops, setting variables, and being introduced to object oriented programming are covered.

Method of Evaluation

3 assignments (30%), a midterm (15%), 2 presentations (8%), feedback (5%), survey participation (2%), a team project (5%) and a final exam (35%). The team project is done with your regular assigned group members (due on the last day of classes) and is about the same difficulty as the assignments. The feedback is for your peers' presentations on weeks when you are not presenting and should take about 15 minutes to complete. Both the midterm and final exam take place in person.

The Experience

Because there are so many sections for this course, it is difficult to generalize about the in-class experience. Generally, the pace is quite relaxed, and there is lots of example code written and explained during class which prepares you well for assignments. If it is your first time programming the assignments can take a long time, but in retrospect they are really quite simple. However, the class material builds very quickly and if you fall behind at the beginning of the class when the simple (but fundamental) topics are being explained, it will be very difficult to catch up. The weekly live sessions can be really helpful to stay on top of the material and the presentations are very relaxed (5 minutes) where you present one of the 8 “recommended exercises.” The exercises should take about 20 minutes to prepare, so they aren’t complicated, but keep you on track with the concepts covered in the week's recordings. The instructor also posts several practice quizzes and past exams that are great preparation for the midterm and final.

Tips for Success

It cannot be stressed enough that you need to try everything yourself first. If you need help the TAs for the course are very knowledgeable and VERY accessible (Ed Discussion + slack channel). PRACTICE PRACTICE PRACTICE!!!! Do not cram for this class as it requires a comprehensive understanding of fundamentals before applying them to more difficult concepts. Go to office hours if you are struggling and frequently check Ed (easy to search up keywords and usually many students already have the same problem as you). Do the practice quizzes and complete them WITHOUT the IDE to really get a feel for WHY a program behaves a certain way.

Instructor:
Giulia Alberini, Jonathan Campbell

Semesters:
Fall/Winter

Prerequisites:
None

Class Size: 400-600

Textbook:
How to Think Like a Computer Scientist (PDF provided on MyCourses) – not required.

Lecture Recordings:
Recorded slides are provided

Entry Last Updated in March 2023

COMP 204

Computer Programming for Life Sciences

Course Overview

The goal of this course is to provide an introduction to computer programming and a solid foundation in Python. The basics of creating loops, setting variables, using object oriented programming, and other transferable skills are covered.

Method of Evaluation

12 Lecture Quizzes (with lowest one dropped) = 11%
10 Mini-assignments (with lowest one dropped) = 45%
2 surveys = 1% + 1% bonus
12 In-class exercises (only need to attend 10) = 5%
Final exam = 38%
Flexible grading scheme available (no need to do in-class exercises)

The Experience

Dr. Becerra (David) fosters a very friendly environment to support the learning of the language – which can be a difficult task! The course is formatted like a flipped-classroom, so you watch the lectures on the weekend and then come to class and do a "lab" session with a TA (optional), a "live coding" session with David, and exercises on Fridays. Assignments provide a good chance to stay up to date with the material. Some assignments are quite difficult and time-consuming, while others are a few lines of code (but of course, the experience varies based on your strengths and if you have prior knowledge of computer programming). There is lots of support available through office hours every day of the week. This course allows you to understand the benefits and applications of computer science in the life sciences, with interesting examples like the diagnosis of patients or the sequencing of DNA.

Tips for Success

- Get started on assignments early so you can get help if needed
- Make use of office hours
- Stay up to date with activities to prepare for the final
- Practice often and treat it like learning a new language!
- Try the quizzes without the IDE
- Understand the behaviour of the code
- Code on paper first, then on your computer (to get your ideas down). Hand coding will also help you practice for the in-person final.
- Do things that are optional for extra practice
- Ask questions in person or on the edStem discussion board

Instructor:
David Becerra
Semesters:
Fall, Winter

Prerequisites and corequisites:
BIOL 112

Class Size: ~170

Textbook:
N/A, Just need to download the IDE (free) and use edStem

Lecture Recordings:
Slides are posted online, and lectures are recorded. Everything is posted on myCourses and edStem.

Entry Last Updated in March 2023

COMP 206

Introduction to Software Systems

Course Overview

Introduction to the Unix Environment, various commonly used Unix tools and utilities, shell scripting. Comprehensive overview of programming in C, use of system calls and libraries, debugging and testing of code; use of development tools like make and version control systems.

Method of Evaluation

5 Assignments (10% each + 2% for the best of the last 3 - 52% total), 3 midterms (20%, 20%, 8% - 48% total). The midterm consisted of multiple-choice and multi-select questions.

The Experience

In contrast to COMP 202, COMP 206 is far more technical. Concepts are covered at a much greater pace, and they often aren't covered in as much detail as one would desire. Due to the nature of the material, much of it ends up being self-taught. Assignments can be long and challenging, but are ultimately the best way of learning and reinforcing concepts taught in class. The multiple-choice questions in the midterms are challenging and can be very specific (particularly for multi-select), so it's important to have a good understanding of the logic and practice trick cases.

Tips for Success

Make use of internet resources! Not surprisingly, there are many programmers on the internet, and they can offer all kinds of help from answering specific questions to explaining concepts in an accessible manner. The Ed discussion board is constantly active with students asking questions; and professors, TA's, and other students, answering questions. Ed is especially helpful when you need clarifications on the assignments. The professor sometimes posts trick cases and exercises to try on your own in Ed, and these tend to resemble what the midterm questions are looking for. For the midterm, be sure to study the different components of Unix computers and have a good understanding of different commands. Ensure that you practice your programming. You may conceptually understand the material, but you must be able to use it to solve practical problems. It can often help to complete the assignment before doing the associated midterm so you have a good understanding of the methods you need to learn.

Instructor:
Joseph Vybihal, Joseph D'Silva

Semesters:
Fall and Winter

Prerequisites:
COMP 202, COMP 204 or COMP 250

Class Size: 383

Textbook:
(Not required)
Software Systems ed3; Vybihal & Azar; Kendall/Hunt; ISBN 978-0-7575-9514-1.

Lecture Recordings:
Lectures are recorded and slides are posted online (on his GitHub repository).

Entry Last Updated in March 2023

COMP 250

Introduction to Computer Science

Instructor:
Michael Langer, Giulia Alberini (Fall)
Semesters:
Fall & Winter

Course Overview

This course introduces you to two core topics in computer science: data structures and algorithms. For the data structures, you will learn about various types of lists (arrays, linked lists, stacks, queues), trees, and graphs, and you will also learn the basic algorithms that use these data structures. You will also learn how to analyze such algorithms in terms of the amount of computation they use. These analysis tools will be used heavily in many subsequent courses, in particular, COMP 251. The course uses Java which is an object-oriented programming language. As such, the course will also teach you some of the basic ideas of object-oriented design. You will learn how classes can be organized into hierarchies, and how variables and methods defined in the classes of the hierarchy are related to each other. These relationships will be developed more fully in subsequent software courses.

Method of Evaluation

Alberini: 3 assignments (27%, 9% each), 2 midterms (40%, 20% each), a final project (25%) which is basically a longer, more comprehensive assignment, and the option of a final quiz or presentation (8%). Spots are limited for the presentation option, and it is meant to act as a mini mock coding interview. The final quiz is administered through myCourses with a mix of MCQ, T/F and fill-in-the-blank type questions. No final exam.

Langer: 6 quizzes (10%), 4 assignments (40%, 10% each), and a multiple choice final examination (50%). Option to shift quiz weight onto the final (i.e. 60%). Final accounted for guessing: final score = raw score – 0.2*mistakes (eg. raw score of 40/50 with 6 mistakes and 4 questions left blank yields a final score of 38.8/50)

The Experience

Professor Langer is an extremely organized lecturer, and he generally approaches topics in a linear and structured fashion. Most of the coding he does in class is in pseudo-code as his lectures focus more on algorithms and theory. Professor Alberini was incredibly organized and detailed in her lectures with what we needed to know and provided countless examples with Java code instead of pseudo-code which helps with understanding the concepts better, especially coming out of COMP202 where pseudo-code is not used. The information given in her slides/lecture is sufficient to successfully complete assignments. Both professors were very available outside of class to help. Being able to do the assignments on your own will really help for the exams.

Prerequisites:
Familiarity with a high-level programming language and CEGEP level math.

COMP 202 or COMP 204 for those with limited programming experience.

Class Size: 600 (flexible)

Textbook:
N/A.
Lecture notes available online.

Lecture Recordings:
Yes

Tips for Success

This class does not focus on teaching you how to code; it will provide the theory behind the code, but you will have to translate this into real code more independently. Start the assignments early because they generally have multiple parts and can be quite time consuming to finesse. Practice problem sets are posted which are very good practice for the exams as there is **minimal coding** (1-2 lines max) on the exams. Try to talk through difficulties with peers!

Entry Last Updated in March 2023

MATH 223

Linear Algebra

Instructor:
Djivede Kelome, Henri Darmon
Semesters:
Fall/Winter

Prerequisites:
MATH 133

Pre/Corequisite:
N/A

Class Size: ~400

Textbook:
Linear Algebra (6th Edition) by Lipshutz and Lipson, Schaums Outlines

Lecture Recordings:
Lectures were recorded by Kelome only due to online format. Unsure of Darmon

Entry Last Updated in March 2023

Course Overview

This course teaches the fundamentals of linear algebra. The first half of the course is a review of the concepts taught in MATH 133 such as matrix algebra, eigenvectors/eigenvalues, spans, dimensions, etc. However, MATH 223 goes into more depth of the theory behind the math. The second half of the course dives deep into matrix representation, orthogonality, and projections. Overall, this course is designed to give students a better understanding of the fundamental concepts in linear algebra.

Method of Evaluation

4 20% Assignments + 30% Midterm + 50 % Final OR
4 20% Assignments + 80% Final

Midterm was dropped if grades improved on final. There was no curve with Kelome, and he makes it very clear that he does not like to implement one.

The Experience

The professors teach this class in a very straightforward manner. Examples of theorems and concepts are given during lectures. The course was fairly fast paced and many new ideas were thrown at you in class. Explanations and solutions to questions may sometimes be vague, but professors and TAs are more than happy to clear up any confusion. The assignments are very doable if started early, and many of the questions are similar to the ones shown in class. Midterm and final questions were fair and not too hard if you studied and prepared properly. Overall, the content is very interesting and fun to learn, but may be overwhelming if you don’t stay consistently on top of the coursework.

Tips for Success

Do all of the recommended exercises from the textbook and more. The exams are fairly straightforward if you understand the course material. Don’t hesitate to ask questions to the professors and TAs . Make sure to review and properly learn all concepts taught in class, even things that may seem minor. The textbook is your best friend. Don’t fall behind as this class builds on material seen on day one. Remember not to stress yourself out too much, and remember to enjoy the class.

MATH 323

Probability

Instructor:
Alia Sajjad
Semesters:
Fall, Winter (different instructors)

Course Overview

This course includes sample spaces, events, probability and conditional probability, independence; discrete and continuous random variables, multivariate distributions; expectation and conditional expectation, and different distributions such as normal, beta, Poisson, binomial, hypergeometric, etc. It is a good overview of probability systems.

Method of Evaluation

Alia Sajjad: + 20%Assignments (4 Assignments, takes best 3)+ 25% Online Midterm + 55% Online Final

The Experience

Dr. Sajjad is a good professor, and the skills build on each-other throughout the semester. It is not a good idea to fall behind. In general, the first few months are easier than the later half of the course.

Tips for Success

Keep up to date with the lectures and ask early if you are not understanding a concept, you will most likely use that concept for the rest of the semester. Start on the assignments early, they are usually posted a week and a half in advance so you can compare your answers with classmates before you submit.

Prerequisites:
MATH 140/139 & MATH 141

Pre/Corequisite:
MATH 133

Class Size: ~150 / section

Textbook:
Multivariable Calculus, 9th Edition, James Stewart (older versions compatible)

Lecture Recordings:
Lectures were recorded.

Entry Last Updated in October 2023

MIMM 214

Introductory Immunology: Elements of Immunity

Course Overview

An introduction to molecular and cellular players of the immune system that act to maintain human defenses against pathogens. The course first covers different aspects of the innate and adaptive immune responses, which cells are responsible for them, and then transitions into application of this knowledge to clinical cases and to pathologies.

Method of Evaluation

Quiz (10%), midterm (30%) and final (45%) exams. Students can choose to do an optional creative assignment (5%) if they'd like their midterm to count for 25%. Formative assignments (10%) are released weekly, which are either cartoon diagrams, concept map diagrams or launchpad multiple choice exercises. There are a total of 10 assignments, each scored 0, 1 or 2. You can complete however many assignments you want to achieve these 10 points.

The Experience

While the course requires memorization of specific proteins, cell types, and immune response profiles, the key material is clearly indicated by the "Take-away Messages" boxes on most slides. Many of the details are mentioned just as examples; the main focus on exams is on big-picture concepts. The in-class multiple-choice exercises are good practices for the midterm.

Tips for Success

The textbook readings (indicated for each lecture) are helpful for understanding the course content; however, the level of detail in the text goes far beyond examinable material. The evaluations are fairly straightforward with regard to the lecture content. If you pay attention to the points that are emphasized in class and study the content presented, you'll do well.

Instructor:
Jasmin Chahal

Semesters:
Winter

Prerequisites:
BIOL 200

Corequisites:
BIOL 201 or BIOC 212

Class Size: ~200

Textbook:
Janeway's Immunobiology, 9e (Murphy)
Kuby Immunology by Punt, Stranford, Jones and Owen, 8e (Punt et al.)

Recommended but not required for exams. Online versions can be found.

Lecture Recordings:
Lectures are recorded. Slides are also posted.

Entry Last Updated in March 2023

MIMM 314

Intermediate Immunology

Instructor:
Ciriaco Piccirillo (coordinator) and Irah King

Semesters:
Winter

Course Overview

MIMM314 is the next stepping stone in the immunology pipeline of classes. Developing upon what you learned in MIMM214, this course discusses the innate and inflammatory processes of the immune system, molecular basis of immune responses, and regulation of immune responses in health and disease. While the course is interactive, the large size of the class may make it challenging for everyone to get involved.

Method of Evaluation

Midterm (30%), Group Case Study Presentation (10%), Online Quizzes (15%), Class Participation (5%) Final Exam (40%).

The Experience

The class is fairly interactive and offers many opportunities for critical thinking and problem solving. Readings may be challenging, but become more clear once discussed in class. Details from the readings are not tested on the exam, and are there to improve your understanding of class material. While the prerequisite MIMM214 is far more general and approachable for someone outside the field/major (like a neuroscience student), MIMM314 is more in-depth. While many neuroscience students will enjoy the class, it is not for everyone.

Tips for Success

Succeeding will be slightly different for each professor and will depend on the evaluation methods. Try to score high grades on the case study and quizzes as they are more reasonable than the midterm and final. Purchase NTCs from MISA if you think it will help you study better!

Prerequisites:
MIMM 214

Class Size: 100-200

Textbook:
None
Assigned Readings (on average 1 per lecture). Janeway's Immunology can be used to refresh basic knowledge or for clarification if you did not take MIMM 214

Lecture Recordings:
Lectures are recorded, and slides are posted

Entry Last Updated in March 2023

NEUR 502

Basic and Clinical Aspects of Neuroimmunology

Instructors:
Dr. Ji Zhang, Dr. Jo Stratton (+ a bunch of guest lecturers)

Semesters:
Winter

Course Overview

The role of inflammation in physiological function of the nervous system, as well as in a broad range of neurological diseases where inflammation can act as a contributing factor to the development of pathology or promote recovery, including fundamentals of neuroimmunology to molecular/cellular aspects of neuroinflammation underlying the pathology seen in clinical conditions.

Method of Evaluation

50% (5% per class) class discussion and paper discussion, 50% mock grant (30% written, 20% from peer feedback and oral presentations)

The Experience

This class is definitely challenging, but I would highly recommend it to anyone who is looking to gain skills to read and analyze papers. This class usually has a significant proportion of graduate students and requires an understanding of wet lab techniques. If you do not have any experience with wet lab techniques, be prepared to spend extra time understanding the papers. Each class is three hours, where the first half is a guest lecturer and the second half is a paper discussion. You need to be prepared to present any of the figure panels in detail and to lead discussion. This can be daunting, especially if it's your first graduate level class, but it really pushes you to critically analyze these papers. A 3 hour class requiring active engagement and participation can be tiring, so come prepared with coffee! The grant proposal is done in groups of three which are assigned by the instructors. The grant proposal definitely requires a lot of literature review and methods understanding.

Tips for Success

Attending every class is required, as each class counts for 5% of your total grade. Read each paper carefully and make detailed notes on the figure panels. Search up labeling proteins you don't know, and try to understand the reason behind each experiment/ how it ties into the hypothesis. Also jot down ideas that you have along the way (what you find weird, interesting, disagreements etc.) It's really helpful to have all of these ideas written down so that you can bring them during the class and add onto other peoples ideas. The class discussion can be really valuable and can help you develop your ideas! For the mock grant, I would meet with your group and start discussing ideas as soon as possible. There are multiple grant workshops throughout the term where you will receive feedback from your professors and peers. Make good use of these, as your professors and (more experienced) peers will likely have valuable contributions and suggestions you hadn't thought of. Overall, the class does require a fair amount of preparation each week, but if you are willing to put in the work it will pay off.

Prerequisites:
MIMM 214 or MIMM 314 or MIMM 314 or PHGY 313 and NSCI 200 or NSCI 201 or PHGY 314 or PHGY 209 or ANAT 321 or ANAT 314 or NEUR 310. (The MIMM prerequisites are not mandatory, but be prepared to watch a couple videos to learn what a T-cell is)

Class Size: ~12 students

Lecture Recordings:
No lectures are recorded and attendance is mandatory. There is a new guest lecturer every week.

Entry Last Updated in March 2023

NEUR 503

Computational Neuroscience

Instructors:
Dr. Pack (course coordinator), multiple guest lecturers

Semesters:
Winter

Course Overview

A survey of computational methods commonly used to model brain function, including mathematical modeling to describe the relationship between neuronal activity and perception, action, and cognition. Mathematical basis for vision, motor control and attention. Data relevant to brain processes and models explaining these data, using engineering, statistics and artificial intelligence.

Method of Evaluation

50% weekly homework assignments (12 total but the worst 2 are dropped), 50% final project (10% oral presentation, 40% term paper)

The Experience

This class is definitely challenging, but I would recommend it to anyone who wants to learn about computational neuroscience in depth. This is a graduate-level class and many people tend to drop out before the add/drop date since the assignments can be very difficult. While there are no official prerequisites, it's definitely recommended to have some programming skills since all the assignments are done in Matlab (similar to Python) and can be even more difficult to understand if you also have to learn to code. The class is doable for those with limited math prerequisites, but it will be more difficult to understand the mathematical/computational models presented in the lectures. Each class has a 3-hour slot, though most presenters only lecture for 1-2 hours and the rest of class time is dedicated to working on the assignment and gives you an opportunity to ask questions to the lecturer or TA. The assignments vary in difficulty, with some being very difficult to understand due to unrelatedness to lecture content while others are much easier and have clearer instructions. Overall, a challenging but interesting class that provides a great overview of important topics in computational neuroscience!

Tips for Success

While attendance is not mandatory, it does help a lot to understand the assignments and to ask questions during class time. Do the readings before the lectures so that you can better understand the lecture. It helps to get started early on the assignments so you have better chances of getting a response if you do ask questions, and make friends in the class since group work is allowed and it helps to share ideas. The final paper is a literature review of a computational neuroscience topic of your choosing and can seem daunting (20-25 pages double-spaced), but you have a lot of flexibility with it and it's not too bad if you get started early. Overall, don't be afraid to ask questions because the assignments can be difficult to understand but the course is doable if you put in the work.

Prerequisites:
None but recommended to have some basic neuroanatomy/neurophysiology, some mathematics (linear algebra, calculus, probability/statistics), some programming

Class Size: ~17 students

Lecture Recordings:
No lectures are recorded. There is a new guest lecturer every week.

Entry Last Updated in March 2023

NSCI 200

Introduction to Neuroscience I

Course Overview

The course provides an introduction to how nerve cells generate action potentials, communicate with one another at synapses, develop synaptic connections, early brain development, and the construction of specific neural circuits.

Method of Evaluation

2 Midterms (20% each), and a final exam (60% of grade). Combination of multiple choice and short answer questions.

The Experience

The course is 50% memorization and 50% application. All three professors were excellent lecturers and had concise lecture notes. The professors are all researchers, so they use experimental examples to explain concepts, getting you used to dealing with data and charts. The most challenging part is the memorization of small details for the midterms and exam, but if you start studying early enough you're gonna do great!

Tips for Success

This is not a course you can cram for. Since the material is cumulative, stay on top of your readings, do the online practice questions which come with your textbook, and **go to tutorials**. If you find you need more concise notes, consider buying the NTCs for this course. Though it is not a transcript of the class, the notes are organized in a logical manner and highlight key points. Remember a lot of this course is application, so memorizing everything will not ensure you do well. Ask yourself questions while you're studying such as, "what will happen if this channel closes?", "what does an overabundance of this neurotransmitter do?". Also remember to read the textbook (it really helps)!

Instructor:
Professors Ruthazer, Stellwagen, and Suvrathan

Semesters:
Fall

Prerequisites:
BIOL 112, CHEM 110, CHEM 120, PHYS 101 or PHYS 131, and PHYS 102 or PHYS 142.

Pre/Corequisites:
BIOL 200, CHEM 212 or permission of instructor

Class Size: ~150 Students

Textbook:
Neuroscience, 6e (Purves)
Not absolutely required, but highly recommended as lecture material is largely derived from textbook content.

Lecture Recordings:
Lectures are in person, recorded and slides are posted

Entry Last Updated in March 2023

NSCI 201

Introduction to Neuroscience II

Instructor: Dr Mohammad Darainy, Dr Stuart Trenholm, Dr Fernanda Pérez Gay Juarez
Semesters:
Winter

Course Overview

The course covers how the nervous system collects and integrates information from the environment, and how that information is processed and used to shape behavior. The course is split into two general sections: inputs to the nervous system (MT1 and MT2) and processing, integration, and outputs (Final Exam).

Method of Evaluation

1 Midterm (25%), 1 scientific report (25%), 1 Final exam (50%). The midterm and final are in person, they are both a mix of MC and short answer questions.

The Experience

NSCI 201 is intense. Each lecture covers many slides of material. Though seemingly overwhelming, this material can be understood if enough time is dedicated to this course. Prof. Trenholm teaches 4 lectures on the visual system, and the rest of the class is taught by Drs Darainy and Gay Juárez. It is highly recommended to follow the textbook to both understand the material better and be prepared for exams as testable material is covered in the textbook. Overall, the class is highly relevant to the major, and will leave you feeling more prepared for the years to come.

Tips for Success

Do not fall behind. This course moves at an incredible rate so do everything you can to stay on top of it. The TAs for this course run terrific tutorials that help you look at the material in a different way. A lot of the information presented may seem like tangents or side notes, but do not be fooled: if it has been brought up in class, it will be tested. When starting to study a section, make sure you nail down the anatomy before moving into the physiology or psychology because it'll make things a lot easier later on. The textbook is also a great source of information. NUM offers NTCs each year that contain things brought up in class and can be a helpful study aid when organizing all of the information before the midterm & final. Use the guiding questions as a study guide for the exams.

Prerequisites:
NSCI 200, PSYC 211 or permission of instructor

Class Size: ~150 Students

Textbook:
Neuroscience (Purves)
Highly recommended as there will be questions from the appendix that are not covered in lecture—but not necessary.

Lecture Recordings:
Lectures are recorded and slides are posted.

Entry Last Updated in March 2023

NSCI 300

Neuroethics

Course Overview

This course provides an introduction to ethical issues arising from basic and clinical neuroscience. Topics include an overview of therapeutic, diagnostic, and research interventions in healthy individuals and those with mental and neurological disorders, and the implications of these interventions on society. Certain lectures discuss the legal and philosophical aspects of these topics, while others work from an ethical framework.

Method of Evaluation

4 lecture commentaries (5% each for 20%, you can write 5 and have your lowest mark dropped), take-home midterm (30%), final paper abstract (10%) and final paper (40%). The lecture commentaries (two pages double-spaced) are worth 5% each and due 1 week after the lecture. They require critical reflection on lecture and reading material. You are given 1 week for the midterm. The midterm consists of answering 2 out of 3 essay questions (6 pages total) dealing with the topics discussed over various lectures and readings. Unlike the midterm, the final paper is research-based and requires the student to make a clear argument. It is 10-12 pages double-spaced, written on a topic of the student's choice, and due at the end of the semester.

The Experience

Neuroethics presents a variety of interesting topics in neuroscience that can lead to very meaningful class discussions. The quality of the class is very dependent on who is presenting, with certain presenters being better than others. There is no memorization in this course, as all of the evaluation is based on critical thinking and effective communication of ideas. There are 2-3 readings for each lecturer that are necessary to do if you want to do a lecture commentary on that lecture, so readings can pile up if not done on time.

Tips for Success

Go to class and get involved in the class discussions. Be familiar with what is expected from you, as that will help a lot. Keeping the 4 principles of neuroethics in mind while writing will help your mark greatly. The TAs are an exceptional resource, so don't be afraid to approach them with any of your questions, especially when you are forming the thesis or outline of your final paper. Moreover, it is recommended that you follow the exact structure of the written commentaries (as shown in samples) to ensure you receive the grade you want. For the midterm and final, pick one or two ethical frameworks and go into detail - depth > breadth. The final is graded by the TAs, who tend to be more lenient in their grading than are the TEAM mentors who grade the commentaires, so do not fear!

Instructor:
Armin Yazdani and guest speakers

Semesters:
Winter

Prerequisites:
NSCI 200, NSCI 201 or permission of instructor

Class Size: ~75 Students

Textbook:
Pragmatic Neuroethics (Racine)
Neuroethics: An Introduction with Readings (Martha J Farah)
These are not required although interesting reads. Required readings are posted on myCourses each week by the lecturers. Also highly recommended to check out other Racine papers/textbook excerpts.

Lecture Recordings:
Lectures are not recorded, slides are usually posted.

Entry Last Updated in March 2023

NSCI 396

Undergraduate Research Project

Course Overview

The goal of the course is to familiarize students with laboratory skills, data collection and interpretation, and communication skills. Students must find a supervisor and submit a Research Project Registration Form before the end of add/drop. The minimum work consists of submitting a final report as well as the required laboratory hours. On top of that, students may have to attend lab meetings, journal clubs, and regular check-ins with your supervisor, depending on the lab. It would be wise to check up on what your responsibilities would be with the supervisor prior to registering for the course.

Method of Evaluation

The course is graded by the supervisor, and is divided into lab performance (50%) and final written report (50%). The final written report is at least 5 pages. Dr. Joseph Dent provides instructions for the final report as well as a mark sheet that the student can pass on to the supervisor for grading.

The Experience

This course varies widely based on the supervisor whose lab you choose to do your project in. Some supervisors may be very hands-on with the project, while others may delegate the supervision of the project to a post-doc or graduate student. As a result, experiences vary. Make sure to speak with your potential supervisor beforehand to ensure you understand what their particular requirements will be for the project. This course is a great way to gain experience in a lab, and more often than not the supervisor would be more than willing to let you continue on in the long term with them.

Tips for Success

Even though this course is very variable, it is pretty straightforward to do well in it once you and your supervisor are on the same page in terms of the work to be conducted. If you don't get regular feedback from your supervisor, it would be a good idea to discuss your performance with them mid-semester to ensure you are on the right track. Also, a semester goes by quickly. Try to maintain regular hours at the lab to not have to rush to produce results in the last few weeks! Writing the report is usually pretty easy once you have been working on your project all semester, but you can ask for feedback from your supervisor or other students in your lab before submitting it if possible.

Instructor:
Course coordinator: Dr. Joseph Dent

Semesters:
Fall, Winter, Summer

Prerequisites:
At least one term of undergraduate studies, a CGPA of at least 3.0, or permission of instructor to waive these requirements. A project proposal form must be completed by the student and supervisor and approved by the unit head (Dr. Joseph Dent for NSCI) before the start of the term.

Class Size: N/A

Textbook: N/A

Lecture Recordings: N/A

Note: A 396 course can be taken in other departments, such as PSYC, BIOL, PHGY, etc.

Entry Last Updated in March 2023

NSCI 410 & 420

Independent Research 1 & 2 (6 & 9 credits respectively)

Instructor:
Course Coordinator: Joseph Dent
Semesters:
Split over Fall/Winter semesters

Course Overview

The goal of the course is to familiarize students with laboratory skills, data collection and interpretation, and communication skills. Students must find a supervisor and submit a Research Project Registration Form before the end of add/drop. The minimum work consists of submitting two abstracts and a final report as well as the required laboratory hours. On top of that, students may have to attend lab meetings, journal clubs, and regular check-ins with your supervisor, depending on the lab. It would be wise to check up on what your responsibilities would be with the supervisor prior to registering for the course.

Method of Evaluation

Proposal Abstract (5%), Progress Abstract (5%), Final Written Report (40%), Laboratory Performance (50%). The student's supervisor evaluates the student. The abstracts are one page double-spaced explaining the rationale, hypothesis, methods, results, and future experiments. The final written report is 15 (NSCI 410) or 20 (NSCI 420) pages double-spaced in a manuscript format.

The Experience

The experience can vary wildly depending on the supervisor, lab environment, and project. Although the minimum laboratory requirements are 9 hours/week (NSCI 410) or 16 hours/week (NSCI 420), this may vary depending on the project. Don't expect regular hours - sometimes projects must be carried out during the night or early mornings (e.g. due to animal sleep cycles, culture incubation periods) or squeezed in between your classes. This course tends to be a fantastic learning experience and very important for students considering graduate school.

Tips for Success

Read up on supervisors whose work interests you. Send them a personalized email explicitly stating why you are interested in their lab and try to sound genuinely enthusiastic! Communicate with your supervisor and fellow lab members! Keep your supervisor updated on progress and mistakes. Don't be afraid to ask them questions to clarify your project. Posters/publications require that extra pinch of luck but go for it if you have a chance! It may be wise to discuss such possibilities with your supervisor ahead of time.

Prerequisites:
NSCI 200 and 201.
Only open to Neuroscience Major U2 or U3 student. Students cannot take both NSCI 410 and NSCI 420.

Class Size: N/A

Textbook:
N/A

Lecture Recordings:
N/A

Note:
NSCI 430 is the Honours Research Project, which is essentially the same as NSCI 420 but only open to Honours Students in U3.

Entry Last Updated in March 2023

PHAR 300

Drug Action

Course Overview

Principles of pharmacology and toxicology. Frequently encountered drugs will be used as a focus to illustrate sites and mechanisms of action, distribution, metabolism, elimination and adverse side effects. Dr. Zorychta teaches the majority of the course while Dr. Hales and Dr. Thanabalasuriar teach a few lectures that are focused on their areas of research and expertise. This course is a standard 300-level biological science course in that it requires a lot of work but, once the work is put in, is very reasonable to do well in.

Method of Evaluation

In-Person: 35% Midterm (~50 questions) + 65% Final (~100 questions), both entirely multiple choice.

The Experience

This course provides a solid background in two important aspects of drug action: drug distribution (pharmacokinetics) and drug mechanism (pharmacodynamics). The lectures cover specific drugs (opioids, stimulants, depressants, anaesthetics, NSAIDs etc.) and discuss their effects on the body and the body's effects on them. Overall, the course was helpful in preparation for more advanced courses (such as PHAR 562) that assume you understand how drugs work and/or how different organ systems work. Overall, this was a challenging experience but nothing drastically harder than the level of difficulty seen in courses such as BIOL 200 and NSCI 201.

Tips for Success

This course is VERY memorization heavy and the lecture slides DO NOT include most of the important information and are not available. Make sure you spend time carefully reviewing each lecture recording and the small details that are given in class. Having a way to organize all of the drugs discussed in class and their various aspects will be critical. Prof Zorychta is notorious for her three types of exam questions: (type A) standard multiple choice, (type B) choosing all of the correct multiple choice options, and (type C) choosing the correct relationship between two given statements. NTCs are offered by the pharmacology student society and are comprehensive notes for each lecture and are extremely useful if you are not comfortable taking very thorough notes, especially since lecture slides contain minimal information. Prof Zorychta herself edits them to make sure they are accurate. Working with a group of people to generate flashcards and practice problems may be a good strategy to make sure you do well!

Instructor:
Professors Edith Zorychta and Barbara Hales

Semesters:
Fall

Prerequisites:
BIOL 200, PHGY 209 (or NSCI 200), PHGY210, and one of BIOL 201 or BIOC 212 (if you took NSCI 200 instead of PHGY 209 or are missing only **ONE** prerequisite, you just need to submit a form before the end of add-drop to be able to take the class).

Class Size: 500

Textbook:
The 6th ed of *Human Pharmacology: Molecular to Clinical*. Brody et al. 2018 is recommended.
Required according to the course instructors but it was not very useful outside of clarifying concepts.

Lecture Recordings:
Yes. Slides are not posted.

Entry Last Updated in March 2023

PHAR 562

Neuropharmacology

Instructor:
D. Bowie, J-F. Trempe, M. Leyton, R. A. McKinney, D. Stellwagen, A. Khoutorsky, G Multhaup, L. Munter

Semesters:
Fall

Course Overview

Varied topics in pharmacology with an emphasis on molecular mechanisms of drug-action as well as cellular targets in the nervous system. Dr. Bowie teaches a third of the course and his section focuses more on the molecular basis of receptors, ion channels and the different types of synapses. The other two thirds of the course are taught by the other instructors that teach their own area of expertise in different neurological diseases or pathologies. This course is a standard 500-level biological science course that requires a fair amount of studying but that may be easier for those with a neuroscience background.

Method of Evaluation

Hybrid: 25% for each online Midterm (non-cumulative, 5 long answers and online) + 25% poster session (peer-graded poster presentation + 5 minute pre-recorded video). No Final!

The Experience

Although PHAR 301 is a prerequisite, most people not in Pharmacology do not have it and can manage doing fairly well. This course provides a deeper molecular understanding of neurological knowledge that is taught in the neuroscience courses a U3 in Neuroscience should have taken by then, as well as put it in the context of disorders and their potential treatments. The course is broken down into 3 sections, each ending with a midterm, that respectively discuss the different types of synapses; epilepsy, drug addiction and pain; different types of neurodegeneration. In terms of the poster and video, the students had carte blanche as long as it was a CNS disease or a CNS drug target. It was quite a fun experience both in making and presenting these to the class: the poster session was very laid-back and the top 3 videos received a price (and are on the pharmacology department website). Overall, this was a challenging experience but nothing too difficult and having a strong neuroscience background more than compensates for lesser knowledge in pharmacology, which can be remedied during class.

Tips for Success

This course is not exactly memorization-centred but it does help to keep in mind the important molecules and genes. It is however very important to understand how the molecular mechanisms work. All the teachers are extremely passionate about what they do, so ASK if you have any doubts, chances are you aren't the only one with that question. Make sure you spend time carefully reviewing the concepts and are able to apply what was taught in a novel way (think Stellwagen-type questions). Working with a group of people to explain the molecular mechanisms to each other or to create practice problems may be a good strategy to make sure you do well!

Prerequisites & Restriction:
PHAR 301 or with permission of instructor.

Restriction:
Open to U3 in Pharmacology but U3 in Neuroscience can take it with permission of instructor.

Class Size: ~100

Textbook:
The 6th ed of *Human Pharmacology: Molecular to Clinical*. Brody et al. 2018 is also recommended.
Required according to the course instructors but it was not very useful outside of clarifying concepts.

Lecture Recordings:
Yes, but only if you are connected to MyCourses (unable to download).

Entry Last Updated in March 2023

PHGY 210

Mammalian Physiology 2

Course Overview

This course is technically a continuation of PHGY 209 but looks into completely different systems than those covered in PHGY 209. Systems covered include: cardiovascular, respiratory, digestive, endocrine and renal systems. This course offers an introductory look into the anatomy and function of each system and how all systems work together to maintain homeostasis.

Method of Evaluation

Midterm (35%) and cumulative final (55%), LearnSmart Assignments (5%), Online Quizzes (5%), all multiple choice

The Experience

If you have not taken PHGY 209 prior to PHGY 210, do not worry! There is barely any overlap between the materials and if you have taken NSCI 200 you will be well-prepared for any references to the nervous system. Overall, this course requires a lot of commitment but definitely focuses more on conceptual knowledge. It is interesting to take in conjunction with neuroscience courses (such as NSCI 201) because it provides insight into how the nervous system—mainly autonomic—controls bodily processes. You will be expected to know not only what the components of the systems are but how the system adapts to changes in the body. The midterm, final, assignments and quizzes are all multiple choice and consist of choosing the best response answers.

Tips for Success

Stay on top of the material! Before you know it, a lot of material will have piled up and you will be moving onto the next system without as much as a pause! The textbook is useful for some professors (Takano in the renal section takes almost all her material directly from it) but for most others, it is better to pay attention to the lecture and refer to the slides directly. Make sure to understand how to use any equations and how to read diagrams or graphs that are presented! Review early and often, as concepts can easily get confusing. Ultimately, this course is quite fast-paced and packed with information, but very interesting!

Instructors: John H White, Tomoko Takano, Michael Guevara, Anne-Marie Lauzon, Melissa Vollrath

Semesters: Winter

Prerequisites:
Introductory Biology (BIOL 111/112), Introductory Chemistry (CHEM 110/120), Introductory Physics (PHYS 101/102), BIOL 200

Corequisites:
BIOL 201/BIOC 212, CHEM 212

Class Size: ~600

(The two sections—morning and afternoon—are identical in lecturers and course material)

Textbook: Vander's Human Physiology – The Mechanisms of Body Function, eds. Widmaier, Raff, and Strang, 15th edition (2019)

Lecture Recordings:
Lectures are recorded and slides are posted

Entry Last Updated in March 2023

PHGY 311

Channels, Synapses, and Hormones

Course Overview

This course starts from Dr. Ruthazer's section from NSCI 200 and goes in much greater depth as well as providing more experimental details. Dr.Cooper covers the basics: how different ions contribute to the resting potential of cells, passive membrane properties, temporal and spatial integration, and generation of action potentials. Dr. Sjostrom's section deals broadly with presynaptic mechanisms, synaptic plasticity in its different forms (Hebbian, LTP, LTD, STDP, etc.), and neurotransmitter release. Dr. Krishnaswamy's section focuses on the physiology of visual system signals, from transduction in photoreceptors to output signals in retinal ganglion cells. Dr. Sharif-Naeini's section applies concepts from the first three sections to neuronal dysfunction associated with neuropathic pain disorders.

Method of Evaluation

10 assignments (3% each = 30%), 3 in person tests (10% per test = 30%), final exam (40%)

The Experience

The course provides a new perspective on how the brain functions at the level of neurophysiology. It gets you thinking about how neuronal excitability and neural networks can modulate the output of the nervous system. This course is heavy in equations, mathematics, and physics (especially Dr. Cooper's and Dr. Krishnaswamy's sections); however, understanding how to approach the problems also requires a firm conceptual grasp of the material.

Tips for Success

Keep up with the material so you are prepared for the tests and reach out to the professors if you need help; they are very helpful and accessible. Problem sets are posted and are very similar to test questions, so make sure to complete them. Check your calculations carefully and compare solutions with a friend if answers are not posted. Doing these will ensure you do well on the tests, which closely follows the course material.

For the exam, the questions that are asked are quite difficult and require some outside of the box thinking, especially for Dr. Cooper's section. On top of doing practice, it is also really important to understand the underlying concepts to what is taught so that they can be applied in these new problems. Try some of the more difficult questions from the sets to prepare you, and once complete, try to make your own problems to really test your understanding! :)

Instructors:
Dr. Cooper; Dr. Sjöström; Dr. Krishnaswamy, Dr. Sharif-Naeini
Semester: Fall

Prerequisites:
PHGY 209 or equivalent (NSCI 200), or permission of instructor

Class Size: 165

Textbook:
Principles of Neural Science (Kandel)
You do not really need to use the textbook; all questions are doable from the lecture material and sample questions provided. This is also the textbook for PHGY 314.

Lecture Recordings:
The class takes a "flipped" teaching style, in which professors provide a number of short lectures before class, and use lecture time to summarize and discuss them. The in-person classes are recorded as well.

Entry Last Updated in October 2023

PHGY 524

Chronobiology

Course Overview

An introduction to the field of chronobiology. The aim is to provide basic instruction on different types of biological rhythms, with particular focus on circadian rhythms. Dr. Storch & Dr. Cermakian start with the molecular mechanisms underlying circadian rhythms, then progress to the behavioural and clinical outcomes that result from these mechanisms.

Method of Evaluation

Exams: midterm (20%), final exam (25%)

Assignments: seminar group presentation (15%), term paper (20%), in-class article discussions (4 x 1.25%), post-seminar summary figures (5 x 2%)

In-class participation: 5%

The Experience

PHGY524 is definitely a great neuroscience course offered at McGill. The professors are friendly, caring, funny and approachable. The material is really interesting and the progression of information is logical. You will learn about a lot of things that weren't covered in your other neuroscience classes. You would have more opportunities to ask profs questions during class because class size is really small.

Tips for Success

Go to class! It is not recorded. Also register early because there are only 20 seats in the class and limited enrolment for neuroscience majors. Go over the lecture slides and key experiments in a group setting to make sure your understanding of the material is thorough. Also figures and graphs are really important! So make sure you understand them. Make sure to start your term paper at least a few weeks early as reading the article and writing it could be time-consuming. The midterms and exams are reasonable if you study but make sure you answer the questions carefully in the midterm. The grading follows a strict but fair rubric, and small marks can be taken off if the questions are not answered explicitly. The class could be relatively time-consuming as there are a lot of small assignments, but it also means that there are a lot of opportunities to do well and safety nets to protect your grades.

Instructor:
Nicolas Cermakian, Daniel Bernard, Kai-Florian Storch

Semesters: Fall

Prerequisites:
BIOL 200, PHGY 209 and 210 (or NSCI 200 and 201), and a relevant 300-level course (PHGY 311 or 314, or PSYC 318, or BIOC 311, or other, with permission of course coordinator).

Class Size: 20 person seminar.

Textbook:
Chronobiology: biological timekeeping (Dunlap et al.)
Textbook readings were not mandatory

Lecture Recordings:
No. Slides posted online before class.

Entry Last Updated in March 2023

PSYC 213

Cognition

Instructor:
Signy Sheldon
Semesters:
Winter, Summer

Course Overview

PSYC 213 is a broad introduction to human cognition, covering perception, attention, memory, language, and intelligence.

Method of Evaluation

There are two midterms, and your midterm mark is worth 45%, but only the midterm you did best on is counted. The final is worth 55% and is cumulative. There is a 100% final option, if you choose to skip both midterms, but this is certainly not recommended for best results. Everything is multiple choice: 50 questions in 80 minutes! There is also the option to participate in the psychology subject pool for an extra 2%, as well as 1% from Top Hat Top Up activities which are good practice anyways.

The Experience

The material presented in this class is not difficult, but the vocabulary and large number of theories covered means you do need to put some time into studying for the exams. The lectures and textbook material overlap very well, but it is still necessary to study from the textbook readings, as some questions come from those.

Tips for Success

There is a lot of jargon to learn (a lot of which is quite nuanced and many theories overlap) and a bit of psychology meets philosophy, and your performance on the multiple-choice format exams will depend on knowing the definitions (Einstellug effect! Decision demons! Hoffding function! Pandemonium! Oh my!). Also, go to the midterm review sessions, even if you did well on the exam! Overall, this is a course that neuroscience students typically do very well in.

Prerequisites:
One previous course in psychology is recommended (but don't sweat it if you haven't taken one)

Class Size: 600+

Textbook:
Cognition (6th edition)
by Smilek et al.

Lecture Recordings:
Lectures are recorded.

Entry Last Updated in October 2023

PSYC 215

Social Psychology

Course Overview

Dr Hehman online: The goal of the course is to gain an understanding and learning about social psychology's concepts, research findings, and theoretical frameworks, as well as how to apply it to everyday life. Topics include an introduction to social psychology and its research, which includes the replication crisis, as well as the social self, the perception of the other and the self, attitudes, attraction, aggression and helpfulness in a social context.

Method of Evaluation

Dr Hehman online: Ten quizzes (2 lowest grades dropped for a total of 25%), one midterm (40%) and final exam (35%). Students can also participate in the Psychology Department Subject Pool for 2% extra credit on the final grade.

The Experience

Dr Hehman online: Engaging lectures during which Dr Hehman clearly explains all concepts and additional studies that may not be in the textbook. Class material is relatively straightforward with a fair bit of memorization (especially if it is not online) but should be fine if you go to class, read the textbook and listen to the podcasts. Podcasts are enjoyable to listen to and touch on a broad enough range of topics to interest you at one time or another! Dr Hehman gave a rough estimate of the questions' content on the midterm and final, which are as follows: 20% only from the lectures, 20% only from the podcast and 60% overlap between the lectures and the textbook.

Tips for Success

Dr Hehman online: Listen to the podcasts and read the textbook before each quiz as the questions are solely based on them and not on the lectures. The quizzes are multiple choice, open book and have no time restraint, so you might want to find the podcast transcript and have the textbook close when doing them. To prepare for the midterm and final, make sure that you are able to define the different topics, both by themselves and in the context of relevant social psychology theories, as well as know an experiment related to each topic and be able to give a real-life example for each of them.

Instructor:
Mark W Baldwin (Fall), Eric Hehman (Winter)

Semesters:
Fall, Winter

Prerequisites:
None

Class Size: ~600

Textbook:
Kassin, Fein, & Markus. Social psychology, 11th edition. Nelson (You can find the 10th edition online but it is at your own risk some questions might come from the textbook…)

Lecture Recordings:
Slides are posted online, and lectures are recorded.

What changed in the online format?
In the online format, lectures are live and recorded. Podcasts and quizzes are assigned every week or so. The quizzes, midterm and final exam are open book which reduces the need for heavy memorization. The midterm exam and quizzes are made of non-cumulative multiple choice questions, while the final is cumulative.

Entry Last Updated in March 2023

PSYC 302

Psychology of Pain

Instructors:
Jeffrey Mogil

Semester: Winter

Course Overview

An introduction to pain research and theory, with emphasis on the interactions of psychological, cultural and biological factors in pain perception. The role of these factors in clinical pain and its management by pharmacological and non-pharmacological means will be discussed. The social impact of chronic pain as well as the opioid epidemic will also feature prominently.

Method of Evaluation

Two midterms (18% each & non-cumulative) and one final exam (46%), mostly multiple choice and some short answer. There is also a research assignment (18%) that requires you to critique a paper of your choice (anything published in the past 5 years with the word "Pain" in the journal's title) by making annotations directly on the PDF file (due in April). The grading scheme is flexible, in that the weight of one non-final exam element (midterm or research assignment) can be either moved to the weight of the final exam (18/18/64) or completely dropped to maintain the weight of the final exam (27/27/46). You can also get extra credit for participating in SONA studies (1%) and for submitting potential test questions (2%)!

The Experience

It is easy to do well in this course as long as you put in the time and effort. The material is very interesting and is always framed in terms of its societal relevance which makes it very topical. The exams were quite straightforward and Dr. Mogil will readily drop any "unfair" questions. The readings, which were mostly meta-analyses and reviews from high impact journals, complemented the lecture material quite well. Overall, Dr. Mogil is a fantastic lecturer who is deeply knowledgeable and world-renowned within his field, as are the guest lecturers that he invites to speak! He is super engaging, friendly and quite open to discussion after class.

Tips for Success

Stay on top of the material and you will be fine! Go to class because you will remember the material more and Jeff Mogil is sooo worth it. Be wary of small details that are on the slides (graphs, etc.); these are fair game and *will* show up on tests! Forming reading groups and dividing up the labour of reading and making summaries for each paper is very useful. There are questions on the exams pulled directly from readings which aren't covered in class, but they are big-picture things! One big bonus of taking this class as a neuro student is that there is a lot of overlap with ANAT 321, NSCI 201, etc. so that helps make the workload a bit lighter. Last thing: start the assignment as early as possible!

Prerequisites:
Any of the following: NSCI 201, PSYC 211, PSYC 212 or permission of instructor.

Class Size: ~400

Textbook:
No textbook, papers were assigned as readings.

Lecture Recordings:
All lectures are recorded. Class slides and papers are posted on myCourses before class.

Entry Last Updated in March 2023

PSYC 305

Statistics for Experimental Design

Instructor: Alia Sajjad (Fall); Jens Kreitwolf (Winter)
Semesters:
Fall/Winter

Prerequisites:
PSYC 204 or equivalent (don't be afraid to register without this – not necessary to be successful in course)

Class Size: 300

Textbook:
N/A

Lecture Recordings:
Yes

Entry Last Updated in October 2023

Course Overview

Basic statistics overview. Introduction to ANOVA, planned and post hoc tests and correlational analysis. Introduction to the consideration of statistics in the design of experiments and to critical analysis of statistical methods in psychology.

Method of Evaluation

Jens (online): Best 5 out of 6 assignments (70%), myCourses discussion board participation (3%), final exam (27%).

Sajjad (in person): Take-home midterm (30%), Assignments (20%), Take-home final (50%).

The Experience

Jens (online): Lectures are well organized. His structure of teaching is presenting definitions of terms and concepts, followed by examples of sample calculations that use the terms and concepts just explained. Assignments are a quiz on myCourses that is open for one week and can be easily completed with the information given in lecture. Each assignment is accompanied with a tutorial lab video that is released a week before the assignment opens and walks through examples of the calculations and recaps concepts that are relevant to the assignment.

Sajjad: The professor is very accommodating, recording lectures and offering a zoom option. She is committed to the success of her students and moves at a fairly slow place. The midterm in Fall 2023 only covered review concepts from PSYC 204. Sajjad emphasizes the importance of using R as a tool for statistical analysis, which is a good skill to learn!

Tips for Success

Jens: For success on assignments, simply attend lectures and watch the appropriate lab tutorial video for the given assignment. If you did not do well on assignment, attend TA office hours to review your mistakes; They will be more than happy to explain any misunderstandings. The final exam is of a similar format to the assignments; However, each assignment is focused on one statistical analysis approach, whereas the final covers all the approaches learnt throughout the semester. Hence, it is important to understand the difference between each approach and on what kind of data it is appropriate to use each.

Sajjad: Go to the tutorials to help you learn how to use R. Make summaries of different hypothesis tests and their assumptions Do the practice midterms and finals, as the exams are very reflective of them. Make sure you understand the fundamentals. Go to class so you can see her annotations of the slides

PSYC 311

Human Cognition and the Brain

Course Overview

PSYC 311 takes a lesion studies approach to understand the basis of human cognition. Topics covered include perception, attention, language, learning and memory, planning and organization. While the effects of brain lesions on cognition are the primary means by which these topics are explored, neuroimaging techniques are also covered in detail.

Method of Evaluation

Midterm (35%), 5 Quizzes (15% total) and Final (50%), all multiple choice. There is the possibility of getting 1% SONA extra credit.

The Experience

Prof. Barbeau and Prof. Vanessa each teach about half of the course, with occasional guest lecturers. Although both professors put lots of information on the slides and it can sometimes feel like they are reading off of the slides, they still take care to explain complex concepts using examples and analogies that are not found on the slides. They are both very passionate about what they teach and bring in a lot of relevant research experience, especially research pertaining to the previous instructor, Prof. Petrides. The hour and a half long lectures are not always the most exciting, but information is always explained in detail and also reviewed briefly at the end of lecture. The quizzes tend to be fairly straightforward, but the midterm and final can be more challenging, as they include many questions of the "A, B, C, A and B, B and C, none of the above" type format.

Tips for Success

Although this seems like a class where you can get by with just the slides, this is not actually the case. Listening to the lecture is essential to getting a full understanding of the course material, especially when it comes to explanation of various studies and experiments. Having a solid understanding of neuroanatomy is also crucial, because there are many questions about the locations of specific brain areas presented on diagrams that weren't seen previously in class. You will need to be able to recognize landmarks of the brain that look vastly different from what you might have been shown in class. The instructors will often quickly and verbally go over the neuroanatomy on minimally labeled diagrams/images, so you will need to take careful notes on these sections or label your own diagrams. The readings are also highly recommended, but you will likely not need to read them in-depth, because there are only a few questions on the readings.

Instructor:
Elise Brochu Barbeau

Semesters:
Fall

Prerequisites:
None

Class Size: ~350

Textbook:
None, although there are required readings

Lecture Recordings:
Yes.

Entry Last Updated in October 2023

PSYC 315

Computational Psychology

Instructor:
Brendan Johns

Semesters: Winter

Course Overview

An introductory course on the field of computational psychology. Topics covered include application of computational methods to the simulation of psychological phenomena. Comparison of natural and artificial intelligence. Symbolic and neural network techniques. Methods for evaluating simulations.

Method of Evaluation

Scheme A: 3 assignments (16.67% each), 4 quizzes (16.67% each with the lowest quiz dropped)

Scheme B: 10,000-word paper on a modeling topic agreed upon with the instructor (100%)

The Experience

PSYC 315 offers introduction to computational modeling with a focus on memory and language modeling. The course provides a unique perspective on phenomena that might have been covered in cognitive science or psychology courses. No coding experience is required to do the assignments as all are done through excel sheets.

Tips for Success

The assignments are relatively easy if you give enough time to do it. The readings and the quizzes could be quite challenging. If you have questions, going to the office hours or emailing the profs are usually very helpful.

Prerequisites:
15 credits in any of Psychology, Cognitive Science, Biology, Mathematics and Statistics, Computer Science, or Neuroscience.

Restriction:
Not open to U0 or U1 students.

Class Size: ~35 people

Textbook:
There is no textbook, but there are resources for optional additional reading that the professor will provide.

Lecture Recordings:
None. Slides posted online at the start of the semester.

Entry Last Updated in March 2023

PSYC 342

Hormones and Behaviour

Instructor:
Euclides José de Mendonça Filho, Barbara Barth
Semesters:
Winter

Prerequisites:
BIOL 111, BIOL 112, BIOL 115 or equivalent

Class Size: ~200

Textbook:
Chapters in different textbooks are posted for each lecture (not mandatory but more for clarification of concepts)

Lecture Recordings:
Slides are posted online, and lectures are recorded.

Entry Last Updated in March 2023

Course Overview

The goal of the course is to gain an understanding of what defines Behavioural Neuroendocrinology as a science. Topics include the role of hormones in behaviour, the functions of different hormones, the impact of development on endocrine regulation, reproductive and sexual behaviours in the context of hormonal regulation, the human endocrine system and how hormones interact within a greater social and cultural context.

Method of Evaluation

Grading will consist of two exams: midterm (30%) and final exam (45%), and one written assignment (25%). Students can also participate in the Psychology Department Subject Pool for 1.5% extra credit on the final grade.

The Experience

Moderately engaging lectures during which they explain all concepts and studies. Class material is relatively straightforward with a fair bit of memorization (it is the endocrine system after all) but most of the content will be topics you have seen before in other neuroscience or physiology courses. You will not miss much if you are not able to attend the class and listen to the recorded lectures instead. However, the readings might help clarify the content seen in class, so you might want to give the readings a brief read-through if there is something you don't understand.

Tips for Success

Go through the lecture materials thoroughly and make sure to read the assigned readings if there is something you don't understand. Self-learning is more than sufficient. The short answers on the midterms are generally straight to the point, but do know how to explain mechanisms that have been seen multiple times and are important. The marking is quite fair and the online midterm grades were exceptionally high, but this might be due to the midterms being open-book and the teachers' first time teaching this class.

PSYC 410

Special Topics in Neuropsychology (3 Credits)

Instructor: Jelena Ristic

Semesters:
Winter

Prerequisites:
PSYC 213 and PSYC 311, or NSCI 201. Knowledge of basic neuropsychology at the level covered in PSYC 311 is assumed.

Class Size: 120

Textbook:
Phantoms in the Brain: Probing the Mysteries of the Human Mind (V.S. Ramachandran) + course pack + Assigned readings

Lecture Recordings:
The lectures are recorded and the slides are posted online.

Entry Last Updated in March 2023

Course Overview

This course focuses on a variety of neuropsychological topics, including phantom limb syndrome, blindsight, temporal lobe epilepsy, and awareness. Topics are usually presented in conjunction with relevant book chapters and readings in both the course pack or journal articles. Each week, a new topic is discussed at length.

Method of Evaluation

Hybrid: 2 online Midterms (the higher mark is worth 35%), 9 weekly thought questions due before class (15% and lowest grade is dropped) and an online final (50%). Midterms are non-cumulative and consist of entirely multiple-choice questions of 3 difficulty levels. Final is cumulative. If you miss both midterms for a valid reason, for the makeup you will need to submit a 5-page critical review paper.

The Experience

2 classes a week, each 1 hour and a half. Professor Ristic usually teaches for an hour and presents videos related to that week's subject or opens the floor for discussions and debates. Each lecture topic is presented and analyzed from the perspectives of different groups of researchers, which are usually previously seen in more depth the readings, focusing on two or three theories and their strengths/weaknesses. It can get quite confusing as many theories are very similar, so it is important to find distinguishing features and focus on them to help keep track of all the different ideas and the different researchers behind them. The discussion/debate period is a useful time to ask questions regarding the material or the readings. The videos provide a simplified explanation of concepts and give you a nice break.

Tips for Success

There are many readings each week, and Professor Ristic sometimes asks fairly specific questions on the examinations. Be sure not to only skim through the readings to write your weekly thought question, but to actually internalize what you read. These thought questions might help you better understand the material, so don't waste that opportunity. In addition, be aware of the theories of each research group, as you may be asked to compare group A's ideas with group B's. Furthermore, questions can be specific, especially regarding the techniques and methods of investigation. Be sure to capitalize on the 2% from participating in the Psychology Participant Pool! Overall, it is a course much appreciated by the students.

PSYC 433

Cognitive Science

Instructor:
Ross Otto
Semesters:
Fall

Prerequisites:
PSYC 212 or PSYC 213

Class Size: ~200 students

Textbook:
No required textbook, all reading material will be provided

Lecture Recordings:
Lectures are recorded.

Entry Last Updated in March 2023

Course Overview

This course covers the multidisciplinary study of cognitive science, exploring the computer metaphor of the mind as an information-processing system. It focuses on levels of analysis, symbolic modeling, Turing machines, and neural networks, as applied to topics such as reasoning, vision, decision-making, and consciousness.

Method of Evaluation

2 midterms (20% each, 40% total), 1 writing assignment (20%), and a final (40%). The questions for the midterms and final exam are all multiple-choice, and cover content mostly from lectures and the readings (about 25-30% of the questions). Questions from the readings are more general points but it is important to do the readings in order to understand the questions. For the writing assignment, the questions (from which you choose 1 option) are released 2 weeks in advance and the assignment is between 4-5 pages, double-spaced.

The Experience

The midterms and final exam were generally fair and completely multiple-choice. Some questions were more difficult while others were much easier, but they overall test your understanding of the lecture content and readings such that if you studied well, you should do well. The material was not conceptually difficult, but the course does require some memorization. Many test questions also look at your ability to apply the information, so it is also important to understand the content. All relevant information and concepts were on the slides or clearly explained in class. Many of the readings were also very accessible and not too difficult to understand, though there is almost one reading for each class.

Tips for Success

It is very possible to do well in this course. The content that is tested is not particularly challenging, and does not require too much time to understand. However, plan your studying time in advance so that you can have enough time for memorization. TAs and the professor are available outside of class for questions and are email-friendly, so don’t be afraid to ask them for help.

PSYC 526

Advances in Visual Perception

Instructor:
Kathleen Mullen, Alex Baldwin, Alex Reynaud
Semesters:
Fall

Course Overview

We examine in detail the structure of the visual system, and its function as reflected in the perceptual abilities and behaviour of the organism. Parallels are also drawn with other sensory systems to demonstrate general principles of sensory coding.

Method of Evaluation

In-person: Two 45-minute in-class tests (15% each), three small assignments (7%+7%+6%), final exam (50%)

The Experience

PSYC 526 is a very interesting course, covering the visual systems from all angles and perspectives. When Professors Mullen and Renyaud are teaching, one of the classes each week is used as a lecture covering new content, and the other class is used as a group discussion about one or two research papers on studies that relate to the previous lecture's content. These sessions can be quite interactive, as students are often broken into groups in addition to getting to talk with the professor. When Professor Baldwin is teaching, all of his classes are lectures with demos. Each of the three professors has a slightly different way of presenting their course material and leading discussions, but all of them are very knowledgeable and friendly, and want you to succeed. At the cellular level, the material does not expand much beyond what students will have already seen in NSCI 201 and ANAT 321. Overall, the class is enjoyable, the illusions you see are super cool, and the material tends to be presented quite well.

Tips for Success

Go to class and make sure you understand the paper discussions! The professors for this course are helpful and willing to answer questions if you find a concept confusing. Some of the readings are optional, but be sure not to skip the essential ones, since there will be questions about them on the tests and final exam. Although previously students were assigned essays to write in this course, this year the professors replaced those with at-home assignments. The first two assignments could be done during certain allotted class times at a computer lab where you had the opportunity to get help from the professor while you were working on them.

Prerequisites:
None

Class Size: 35

Textbook:
All assigned readings (including research papers and some textbook chapters) are uploaded onto MyCourses.

Lecture Recordings:
Audio-only, but slides are posted on MyCourses.

Entry Last Updated in November 2023

PSYC 529

Music Cognition

Course Overview

Interdisciplinary study of music cognition, with an emphasis on psychological, computational, and neuroscientific approaches. Focuses on listeners' response to sound, including perception, attention, memory, motor control, skilled performance, and emotional response.

Method of Evaluation

There are two mid-term exams (25% each; non-cumulative), an oral debate-style presentation (20%), assignments (20%), and class participation and attendance during oral presentations (10%). The assignments are to propose 4 thought-provoking questions for the 2 papers assigned to each debate (2 questions for the “pro” paper and 2 questions for the “con” paper).

The Experience

This class examines topics such as musical acoustics, perception of melody and rhythm, musical memory, underlying neuroscience of music, performance and skill acquisition, developmental perception, emotional response, and evolution of musical abilities. Most information is on the slides, but it helpful to attend class and have these concepts explained. This class is not as “neuroscience” based as some other courses, but discusses many concepts of music and auditory cognition and processing that will likely be novel to students and very interesting to those that are interested in learning more about these concepts!

Tips for Success

This class is definitely designed for people with some musical background and curiosity for various aspects of auditory and music processing. Many of the concepts assume and rely on a foundation of music and music theory. Therefore, it is highly recommended that students have at least a basic background in music. However, it is not crucial as most students don’t have a musical background (just takes a bit more effort to learn) It is important that you understand the material presented in the lectures! The exams are mostly short-answer and fill-in-the-blank; most of the questions are covered in lecture material, but there are occasionally questions based off of assigned readings. Questions can be quite specific, and be sure you know your axis labels of mentioned graphs! You are assigned to an oral presentation topic and debate side after you rank them, and present with a partner(s) the paper you are assigned against another team. Following that, the professor asks you questions that were proposed by other students in the class; the other team has an opportunity to rebuttal. Questions are not graded harshly, but most show some level of critical thinking.

Instructor:
Caroline Palmer
Semesters:
Fall

Prerequisites:
PSYC 212, PSYC 213, and PSYC 204 (or equivalent); or permission of the instructor.
Some familiarity with musical reading and/or performing an instrument.

Class Size: 33

Textbook:
There is no textbook, but each class has 1-3 assigned papers.

Lecture Recordings:
There are no lecture recordings.

PSYT 500

Advances: Neurobiology of Mental Disorders

Instructor:
Lalit K Srivastava, Tak Pan Wong and many other lecturers

Semesters:
Winter

Course Overview

Current theories on the neurobiological basis of most well known mental disorders. Professors Wong and Srivastava teach approximately a third of the class and the rest is taught by professors working in each of the specific fields. Each professor is an expert in the field and discusses their ongoing research. They present the genetic, physiological and biochemical factors of the specific illness (schizophrenia, BPD, substance abuse, etc.) and then focus on the basis for current treatments and on treatments in development.

Method of Evaluation

There is a midterm (25%), final paper discussing a research article from a list of assigned articles (25%) and a cumulative final exam (50%). Both exams are short and long answer based.

The Experience

This course involves a lot of memorization. Most of the information for the midterm is found in the slides; however, you need to supplement the slides with your own notes to do well and the few required readings are important. Overall, it's very interesting to hear the perspectives of people immersed in the fields they are discussing and you get a very comprehensive overview of different topics in psychiatry. However, because the course is composed of many different lecturers, the lectures may appear quite independent of one another or some may have some small overlap.

Tips for Success

To do well in the course, pay attention in class and memorize! Memorize the slides and be sure to take lots of detailed notes during the lectures since many of the professors have very bare slides that require your own notes for explanations. All of the questions on the midterm and final are long answer so make sure you know the material well enough to answer questions using free-recall only. Tiny details, especially in the neurochemistry section, have been tested previously (e.g. listing differences between serotonin receptor subtypes or specific enzymes in important pathways) and supporting/opposing evidence for theories presented in class is also something you should be familiar with. The final paper is only 5 pages double-spaced and is more based on your own thoughts than research, but if you want a specific paper, be sure to be on MyCourses at the time set and have a backup paper, otherwise you might end up with whatever is left. Spots for this class fill up fast and you must obtain instructor approval to register for the class. Be sure to email ASAP to secure a spot and to keep emailing until you do!

Prerequisites:
BIOC 212 and BIOC 311, or BIOC 312, or BIOL 200 and 201, or PHGY 311, or PSYC 308 and an upper-level biological science course with permission of the instructors, or equivalent.

Restriction:
Restricted to U3 and graduate students

Class Size: ~50 Students

Textbook:
No Textbook, Occasional Assigned Article Readings

Lecture Recordings:
Lectures are not recorded but slides are posted. Previous year's recordings are posted but might not have the same content. Lecturers usually do not mind students recording the lectures with their own devices which is always a good idea!

Entry Last Updated in March 2023