



This catalogue is for promotional purposes and doesn't represent the list of active courses in any given year at Quest. While the catalogue does include our curriculum requirements and program details, it may show courses that were offered in the past and may or may not be offered in the future.

# TABLE OF CONTENTS

## **TERM CALENDAR /2**

## **REQUIREMENTS /4**

## **ARTS & HUMANITIES /7**

Foundation Humanities /7

Concentration Humanities /11

Languages /17

## **INTERDISCIPLINARY COURSES /20**

## **LIFE SCIENCES /25**

Life Science Foundations /27

Life Science Concentrations /28

## **MATHEMATICS /37**

Mathematics Foundations /37

Mathematics Concentrations /38

## **PHYSICAL SCIENCES /41**

Physical Sciences Foundations /41

Physical Sciences Concentrations /42

## **SOCIAL SCIENCES /47**

Social Sciences Foundations /47

Social Sciences Concentrations /48

# 2019-2021 TERM CALENDAR

		2019-2020 ACADEMIC YEAR							2020-2021 ACADEMIC YEAR						
		S	M	T	W	T	F	S	S	M	T	W	T	F	S
2019 FALL TERM	SEP						30	31	30	31	1	2	3	4	5
		1	2	3	4	5	6	7	6	7	8	9	10	11	12
		8	9	10	11	12	13	14	13	14	15	16	17	18	19
		15	16	17	18	19	20	21	20	21	22	23	24	25	26
		22	23	24	25	26	27	28	27	28	29	30	31		
	OCT	29	30	1	2	3	4	5	4	5	6	7	8	9	10
		6	7	8	9	10	11	12	11	12	13	14	15	16	17
		13	14	15	16	17	18	19	18	19	20	21	22	23	24
		20	21	22	23	24	25	26	25	26	27	28	29	30	31
	NOV	27	28	29	30	31	1	2	30	31	1	2	3	4	5
		3	4	5	6	7	8	9	2	3	4	5	6	7	8
		10	11	12	13	14	15	16	9	10	11	12	13	14	15
2020 SPRING TERM	DEC	17	18	19	20	21	22	23	16	17	18	19	20	21	22
		24	25	26	27	28	29	30	23	24	25	26	27	28	29
		1	2	3	4	5	6	7	30	31	1	2	3	4	5
		8	9	10	11	12	13	14	7	8	9	10	11	12	13
		15	16	17	18	19	20	21	14	15	16	17	18	19	20
		22	23	24	25	26	27	28	21	22	23	24	25	26	27
	JAN	29	30	31	1	2	3	4	28	29	30	31	1	2	3
		5	6	7	8	9	10	11	25	26	27	28	29	30	31
		12	13	14	15	16	17	18	22	23	24	25	26	27	28
		19	20	21	22	23	24	25	19	20	21	22	23	24	25
		26	27	28	29	30	31	1	26	27	28	29	30	31	1
	FEB	2	3	4	5	6	7	8	23	24	25	26	27	28	29
2020 SUMMER TERM		9	10	11	12	13	14	15	20	21	22	23	24	25	26
		16	17	18	19	20	21	22	27	28	29	30	31		
		23	24	25	26	27	28	29	24	25	26	27	28	29	30
		30	31	1	2	3	4	5	31	1	2	3	4	5	6
	MAR	1	2	3	4	5	6	7	28	29	30	31	1	2	3
		8	9	10	11	12	13	14	25	26	27	28	29	30	31
		15	16	17	18	19	20	21	22	23	24	25	26	27	28
		22	23	24	25	26	27	28	19	20	21	22	23	24	25
	APR	29	30	31	1	2	3	4	16	17	18	19	20	21	22
		5	6	7	8	9	10	11	13	14	15	16	17	18	19
		12	13	14	15	16	17	18	10	11	12	13	14	15	16
		19	20	21	22	23	24	25	17	18	19	20	21	22	23
2021 SUMMER TERM	MAY	26	27	28	29	30	1	2	24	25	26	27	28	29	30
		3	4	5	6	7	8	9	31	1	2	3	4	5	6
		10	11	12	13	14	15	16	28	29	30	31	1	2	3
		17	18	19	20	21	22	23	25	26	27	28	29	30	31
		24	25	26	27	28	29	30	22	23	24	25	26	27	28
		31	1	2	3	4	5	6	19	20	21	22	23	24	25
	JUN	7	8	9	10	11	12	13	16	17	18	19	20	21	22
		14	15	16	17	18	19	20	13	14	15	16	17	18	19
		21	22	23	24	25	26	27	20	21	22	23	24	25	26
		28	29	30	1	2	3	4	27	28	29	30	31	1	2
	JUL	5	6	7	8	9	10	11	24	25	26	27	28	29	30
		12	13	14	15	16	17	18	21	22	23	24	25	26	27
		19	20	21	22	23	24	25	18	19	20	21	22	23	24
	AUG	26	27	28	29	30	31	1	25	26	27	28	29	30	31
		2	3	4	5	6	7	8	22	23	24	25	26	27	28
		9	10	11	12	13	14	15	19	20	21	22	23	24	25
		16	17	18	19	20	21	22	16	17	18	19	20	21	22

# WELCOME

Quest University seeks to reinvent higher education through an intensely student-centred approach and a groundbreaking curriculum. We have no lecture halls, majors, or departments. We offer a single degree, the Bachelor of Arts and Sciences, based on an interdisciplinary curriculum. We use the Block Plan: students take one course at a time, meeting every weekday for 3.5 weeks. At Quest, students play a central role in designing their education.

Our curriculum—designed to optimize active and organic learning across the liberal arts and sciences—consists of two parts.

Starting with our signature Cornerstone course, the two-year Foundation Program has students explore a broad range of subjects across the liberal arts and sciences. These 16 courses guide students through timeless and contemporary questions, and foster curiosity, skills and knowledge.

Students then transition to the Concentration program, the last two years at Quest, where they create their own path via a self-constructed Question. Under the guidance of a faculty mentor, students take 6-8 Concentration courses based on their Question; engage in 1-4 Experiential Learning courses, which are often off-campus; select at least 3 Electives; and complete their Keystone, a major work that can take different forms—from research papers to art installations, and from screenplays to policy proposals and more.

This unconventional intellectual journey produces deeply valuable outcomes. The Quest curriculum ensures that students develop understanding and skills in critical thinking, communication, integration/breadth, international perspectives, research, and ethics.

Students achieve this through commitment, passion, resilience and hard work. We ask that our students begin to take ownership of their learning right from the start—for example requiring students to demonstrate a basic set of quantitative reasoning skills (“Q skills”) before taking many of our Foundation courses so their experiences of those courses can be rich and deep. (We advise that new students begin preparing for this in advance of arriving at Quest.) From there, students grow in the kinds of questions they ask, discussions they have, perspectives they hold, and ideas they can form at Quest and beyond.

We believe your Quest journey will be a fruitful one, and that this document will provide you with a basic map to help you plan your route. Best of luck in your intellectual adventures at Quest University!

# REQUIREMENTS

## COURSE OPTIONS

Any course listed with an X in the course code (e.g., MAT 20XX) indicates that students may choose one of several offerings. Appropriate courses that meet the Foundation requirement must follow the course formula provided in the above table (e.g. MAT 2003 or MAT 2004 would meet the Mathematics requirement, but MAT 2200 or MAT 3000 would not).

## PREREQUISITES

Quantitative Skills Strands which are prerequisites for Foundation courses are indicated with circles. The four strands are **N** NUMBER, **G** GRAPHS, ALGEBRA and **M** MEASUREMENT. Students who have not demonstrated proficiency in the prerequisite strand(s) prior to the start of the course will be denied entry into the course.

Please note that for HUM 21XX, 22XX, 23XX and MAT 20XX, some options may have a Q Skills pre-requisite, but most options do not. Please consult individual course descriptions in this Catalogue for details.

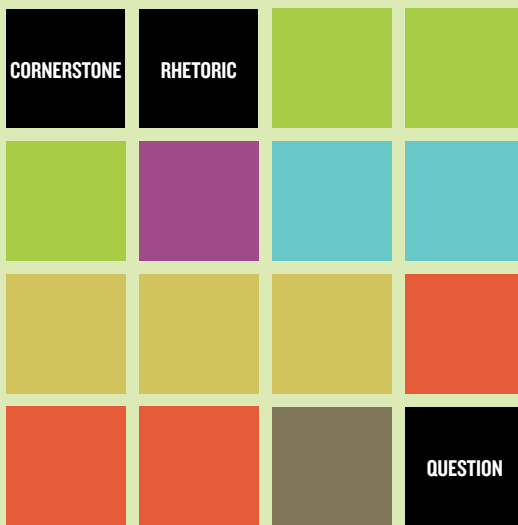
## Foundation Program POLICIES

Please note the following policies regarding the Foundation Program:

- During their first year, students may take at most one Concentration-level course (course starting with a 3 or 4 number).
- Students may take no more than four Concentration-level courses before completing the Foundation Program.
- All Foundation courses must be completed by the end of the third year of full-time study.

# Build Your Degree

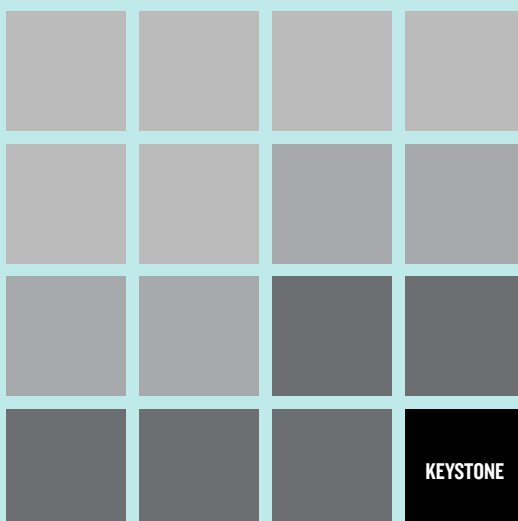
## THE FOUNDATION PROGRAM IN DETAIL



The first two years of your degree consist of 16 courses, a multidisciplinary curriculum that spans the liberal arts and sciences, tackling themes from the classic to the contemporary. Toward the end of your second year, you will write your personalized Question, developed with faculty guidance in a dedicated course called Question.

- three Core courses
- three Life Sciences
- one Mathematics
- two Physical Sciences
- three Social Sciences
- three Arts & Humanities
- one Language

## THE CONCENTRATION PROGRAM IN DETAIL



In the Concentration Program, you design your own academic path while working with a Faculty Mentor. Inspired by your Question, you'll pursue what you're most passionate about, taking 16 courses that include Electives and Experiential Learning along with your Focus courses. You'll cap your undergraduate education with a Keystone project, which you will present during your Keystone course.

- at least six Focus courses
- one to four Experiential Learning
- one to eight Electives
- Keystone

## HERE'S HOW NICOLE BUILT HER PERSONALIZED QUEST DEGREE



### NICOLE ZANESCO '19

**HOMETOWN:** Calgary, Alberta

**QUESTION:** How can we build peace?

#### FOCUS COURSES

The Cold War  
Colonialism  
Foreign Policy and the Middle East  
Political Identity and Conflict  
Postwar Europe  
Quest for Antarctica  
Security Studies  
War, Conflict, and History  
War, Film, and History

#### ELECTIVES

Creative Writing  
Studio Art  
Time Travel  
Anthropology  
Conservation of Migratory Species

#### KEYSTONE

Poles of Contention:  
Polar Governance as a Path Towards Peace

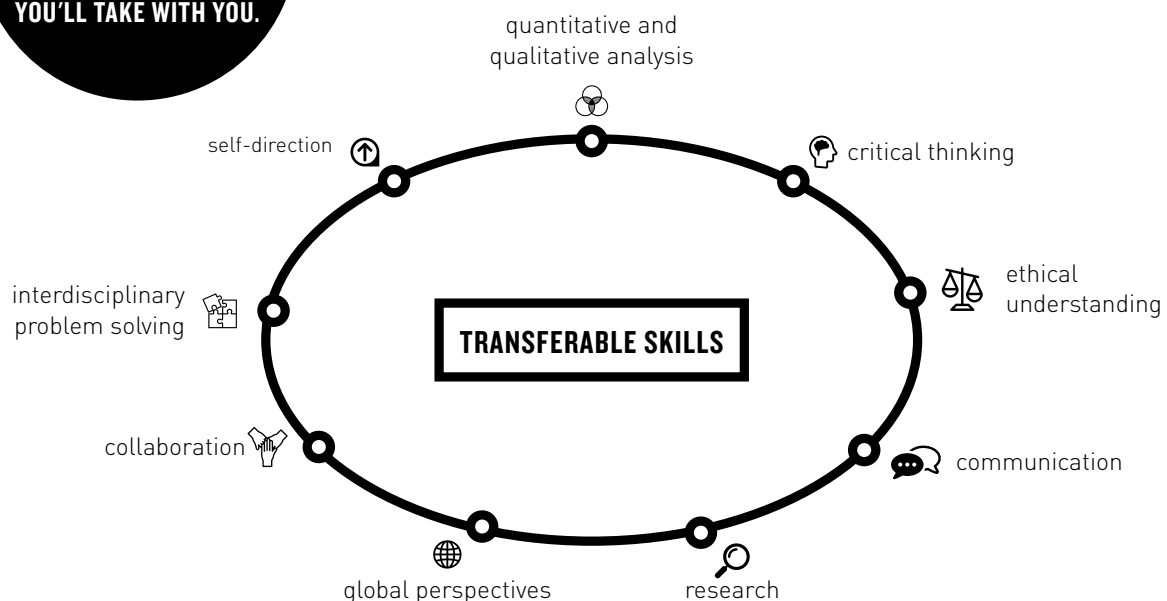
#### EXPERIENTIAL LEARNING

Summer internship with the Calgary Military Family Resource Centre

#### WHAT SHE'S DOING NOW

Nicole is pursuing a master's in International Relations from the prestigious London School of Economics and Political Science.

NO MATTER HOW  
YOU BUILD YOUR  
DEGREE, HERE ARE THE  
TRANSFERABLE SKILLS  
YOU'LL TAKE WITH YOU.



# ARTS & HUMANITIES

## FOUNDATION: ARTS & HUMANITIES

To fulfill the requirements of the Foundation Program in the Arts and Humanities, students must complete the following courses:

- Texts (HUM 21XX)
- Scholarship (HUM 22XX)
- Culture (HUM 23XX)

In **TEXTS** courses, students learn strategies for close-reading, and examine the rules that particular kinds of texts follow. **SCHOLARSHIP** courses take as their focus debates that are of interest in the humanities, and developing skills to take part in these debates. **CULTURE** courses are about how works of literature, films, music, photography, et cetera, are embedded in and reflective of “webs of significance that [we ourselves] have spun” (Weber).

For each of these, students may choose one of several options. Please note that additional offerings may be available at the time of registration. Consult Self-Serve for a list of current offerings.

While students may take these courses in any order, the Division of Arts and Humanities recommends that students take a Texts or Culture course before taking a course in Scholarship.

## FOUNDATION HUMANITIES

### HUM 2101 TEXTS: DANTE’S COMMEDIA

This course uses Dante’s masterpiece, the *Commedia* (also known as the *Divine Comedy*), composed of *Inferno*, *Purgatorio* and *Paradiso*, to introduce students to fundamental techniques in literary analysis. We begin the course with a close reading of *Inferno*, seeking to understand the ways in which texts, and especially poetry, create meaning and beauty. We then turn to *Purgatorio*, aiming to place the text within a historical context, specifically the invention of the idea of purgatory in the High Middle Ages. We then read *Paradiso* through the lens of textual influence, investigating Dante’s relationship to his sources. The course ends with a brief look at ways in which *The Divine Comedy* has affected modern understandings of the afterlife.

### HUM 2103 TEXTS: POETS AND PHILOSOPHERS

This course takes as its subject the greatest poem ever composed (Homer’s *Iliad*) and the greatest philosophical dialogue ever written (Plato’s *Republic*). We will come to understand why John Keats, upon first discovering the *Iliad*, felt that he had discovered “a new planet.” And we will learn why Plato’s *Republic* continues to exert tremendous influence on philosophers, literary critics and political theorists, two thousand years after it was written. The questions that guide this course are: How does Plato (and perhaps Socrates) make space for new ideas through the genre of philosophical dialogue? Why have the *Republic* and the *Iliad* exhibited such lasting power? How do Homer and Plato recommend that we guide our lives, and why should we listen?

### HUM 2105 TEXTS: INTRODUCTION TO SHAKESPEARE

This field course takes up the problem of literary interpretation as it applies to theatrical performance. For live theatre, directors, actors and designers must ensure every line, every gesture, every costume, every set, every light—in short, everything the audience will see and hear—conforms to a consistent interpretation. We spend two weeks

on campus in intensive preparation of five Shakespeare plays; for the third week, we travel to the Shakespeare Festival Theater in Ashland, Oregon to see them performed live: *Richard II*, *Hamlet*, *The Winter’s Tale*, *Twelfth Night*, and *Timon of Athens*. These plays cover the entire range of Shakespearean drama: comedy, tragedy, romance and history. We go backstage and talk to designers and actors. Students learn how to read Shakespearean drama with an eye to developing their own interpretations: What are the most important themes of a play? If you were a director, how would you stage it? How do you evaluate a performance? For fun, we will also attend a few contemporary dramas. An approximate \$500 field trip fee applies for food and lodging. You will not be considered fully registered until you have paid the non-refundable deposit; you will be dropped from the class one week from the time you register on self-serve if you fail to deposit.

### HUM 2114 TEXTS: UTOPIA/DYSTOPIA ANTI-REQUISITE: SCHOLARSHIP: UTOPIA/DYSTOPIA

In this course, we shall learn to closely read and analyze works in the genres of utopia and dystopia. Texts exploring alternative visions of human political and social possibilities are as old as Plato’s *Republic*, but more such have been created in the past century than in the preceding 2,000 years put together. We will examine the nature, purpose and persuasiveness of various utopian and dystopian writings from last century. Complete works drawn from the vast literature depicting imaginary societies will be read, and the ideas, means and processes used by the authors of those works will be analyzed and discussed to encourage students to develop their own understanding of what constitutes a convincing utopia or dystopia and why.



## **HUM 2115** **TEXTS: TRUTH, BEAUTY, AND GOODNESS**

In this course, we shall investigate three central philosophical questions: What is truth? What is beauty? What is goodness? Perhaps surprisingly, there are clear and concise (if complex) answers to each of these questions. We shall approach these questions by studying two of the greatest philosophical works ever written: Plato's *Republic*, and Aristotle's *Nicomachean Ethics*. Since this is a Texts course, we will focus on the close reading, articulation and evaluation of logical arguments.

## **HUM 2118** **TEXTS: THE QUESTION OF BEING**

Martin Heidegger's academic career begins with an attempt to "recover" the "Question of Being," the question of how we understand (and what we understand as) the Being of beings. Throughout the latter part of his life, this question took many forms, among which were attempts to understand truth, art, technology and place in a fundamental way, and to articulate the extent to which we can grasp such things only via language as the basis of our knowing. Inextricable from this academic work is Heidegger's involvement with Nazism and the Nazi Party in Germany leading up to and during WWII, which remains necessarily problematic and cannot be overlooked. In the context of this course, we will approach the highly complex philosophical works of this complicated historical figure, both as the objects of our close reading and to determine what close reading is at root. This will perhaps permit us to determine whether an approach such as Heidegger's is valuable for understanding of the way we relate to, and interact with, what we find in the world.

## **HUM 2119** **TEXTS: THE BOOK OF BEASTS**

From werewolves and unicorns to falcons and hounds, this course investigates the symbolic use of animals in medieval texts and images. In the European Middle Ages, the natural world was seen as a great book that could be "read" to reveal hidden lessons about morality and behaviour. In other words, medieval people studied animals to learn about themselves. The ways that writers interpreted and used these symbols, however, varied tremendously based on the social/historical context and the genre of the text in question. Throughout the Block, we will study the use of animal symbols in several different literary and sub-literary genres including bestiaries and encyclopedias, hunting treatises written by medieval kings and dukes, a romance written by one of the earliest female writers in the European tradition, and historic cookbooks. You'll also develop the skills you need to begin reading Middle English from manuscript sources and decipher a simple medieval text in its original form.

## **HUM 2121** **TEXTS: BLACK SONIC TEXTS AND AFROFUTURISM**

Black sonic texts are synonymous with global popular culture. Often these texts are expressed through music: from the earliest strands of the blues, rock 'n' roll and jazz, to the omnipresent flow of a hip-hop emcee, black sonic texts, in their lyrical and rhythmic richness, have marked the globalisation of blackness—and the blackness of cultural globalisation. In this course, we will turn to twentieth century black sonic texts, reading two novels—Ralph Ellison's *Invisible Man*, and Ishmael Reed's *Mumbo Jumbo*—and one work of theoretical sonic fiction, Kodwo Eshun's *More Brilliant Than The Sun*. Alongside these works, we will listen to, and learn to closely read and analyse, Afrodiasporic film, music video, graffiti and musical genres from the period: blues, jazz, rock 'n' roll, dub, funk, soul, hip-hop and black electronic music (Detroit techno, Chicago house, UK jungle). We will contextualise our close readings by exploring theories and analyses of Afrofuturism that seek to explicate these sonic texts in respect to themes of race, science fiction, posthumanism and the black radical imaginary.

## **HUM 2123** **TEXTS: ONE HUNDRED YEARS OF SOLITUDE**

This course will take as its centre Gabriel García Márquez's masterwork, *One Hundred Years of Solitude* (1967). While we will consider the historical context of both the novel's production and the events behind the narration, the focus of the course will be on a close reading of the novel, so that we may appreciate its style, narrative techniques and resources (myth; magical realism). The saga of the Buendía family offers the reader not only a glimpse at the cyclical nature of (Latin American) history, but also at one of the richest narrative worlds of the twentieth century.

## **HUM 2201** **SCHOLARSHIP: DEATH OF THE AUTHOR**

Roland Barthes wrote that "the birth of the reader must be at the cost of the death of the author." This provocative statement expresses one possible approach to the interpretation of texts. How do we construct meaning from a literary text? Who decides what constitutes a correct interpretation? Is the author the authority? Must we know anything about an author (and, by extension, the context of the author's production) to understand and appreciate a literary text? While structuralist and deconstructionist literary critics might revel in the freedom of the text from its author, other equally compelling approaches depend on a continued attention to the author and his or her circumstances of production. In this course, we will study the work of several theorists, including Barthes, Foucault, Derrida, Jakobson, Irigaray and Spivak. We will also explore and practice interpretive approaches through short stories and novels that themselves call into question the role of the author.

## **HUM 2202** **SCHOLARSHIP: CHINESE FILM AND TRANSNATIONALISM**

What is film? What is Chinese film? What is the relationship between national film and transnational cultural flows in Chinese and global contexts? This humanities foundation course centres around these three questions to guide students through the interdisciplinary field of film studies, film theory and film scholarship. You will learn to become a film scholar in this class by examining the texture of films (form, style, narrative and genre); tracing important political and aesthetic movements in 20th century Chinese history and Chinese film history; discussing the most influential critical writings and philosophies about film; and engaging in-depth with critical discourses of nationalism and transnationalism about Chinese film.

## **HUM 2203** **SCHOLARSHIP: PHENOMENON OF MUSIC** **ANTI-REQUISITE: DIMENSIONS OF MUSIC**

The main question for this course is: What is the phenomenon of music, and what can examining it tell us about music, ourselves and society? In this course, students engage contested ideas of what music and musical experience is through examining and participating in different approaches to the scholarship of musical experience. Issues examined include: the roles of historical ideas such as genius in our experience of music today, the role of culture in musical experience, linkages between music and emotions, biological investigations of musical experience, musical performance, the relationship of musical analysis and experience, how music in commodity form affects experience, and the phenomenology of music.

## **HUM 2206** **SCHOLARSHIP: THE SCIENTIFIC REVOLUTION** **PREREQUISITE: ALGEBRA Q-SKILL**

There was no such thing as the Scientific Revolution, and this is a course about it. This claim, borrowed from the opening of Steven Shapin's *The Scientific Revolution*, highlights a central tension in the history of science. Historians of science often reject the view that there was an abrupt shift in the practice of science, or even that anything like a unified science existed to be revolutionized in the first place. On the other hand, the modern sciences seem distinctive enough as to require their own history, and the period from about 1500-1700 is still seen as crucial to that history. In this course, we explore the question of whether there was a Scientific Revolution, and, if so, what it was. Students trace the origins of foundational theories, analyze the rhetoric of scientific debates, and even recreate crucial experiments to understand better contemporary debates about the Scientific Revolution.

## **HUM 2208** **SCHOLARSHIP: ETHICS**

About morality, Socrates said: "We are discussing no small matter, but how we ought to live." In this course, we will examine historical and current readings centered around three major debates in ethics: consequentialist vs deontological approaches to deciding whether an action is right or wrong (do you decide by examining the consequences of your action or by relying on a set of moral principles?); the meta-ethical debate on whether moral value is relative (are morals "just" a product of culture, or is there some way that morals might be universal and/or objective?); and the question of how to best set up a just society (are morals on the societal level best understood in terms of rights or in terms of fair distribution of resources?). Students will have the chance to think about larger philosophical questions, but also to think about current ethical issues. We will tie the moral theories we read to current-day events, for example, ethical issues arising in the context of politics, medicine, education, civic responsibility, the environment, war and technology. Throughout, we will work to sharpen reasoning and argumentation skills and more generally to develop an understanding of what it means to inquire philosophically.

## **HUM 2211** **SCHOLARSHIP: CULTURAL STUDIES**

A preeminent scholar in Cultural Studies, Stuart Hall, stated that the field lies at "the dirty crossroads where popular culture intersects with the high arts, that place where power cuts across knowledge, where cultural processes anticipate social change." An interdisciplinary field from its founding, Cultural Studies examines forces that shape peoples' lived realities. This course will trace several works in Cultural Studies that span continents and times, to consider the field's methodologies and theoretical frames. We will read several monographs and make ourselves familiar with grounding theories that span studies of jazz music to contemporary practices of incarceration. Authors that we will examine include Raymond Williams, Paul Gilroy, Homi Bhabha, Frantz Fanon, Mimi Thi Nguyen, Lisa Cacho and Glen Coultrard.

## **HUM 2213** **SCHOLARSHIP: POSTHUMANISM AND THE RACE FOR UTOPIA**

The Western tradition has often grappled with the boundaries of the human. Moreover, definitions of the human change. This seminar looks at how scholars have approached the question of the human and provides students with critical tools for the interrogation of the very field in which such questions tend to situate themselves: the "Humanities." We will assess the invention of the human in the Western tradition by turning to conceptual tools in critical race, gender and ideological theory. Studying these tools will aid us in questioning systems of knowledge and power that privilege some humans while excluding (the) others. To this end, this seminar will explore scholarship that critiques humanism as inseparable from colonialism and its "civilizing" drive

to perfect the human race, making a utopia for some, a dystopia for others. We will likewise turn to contemporary post-humanist theory that questions the boundaries between human, animal and machine, and to scholarship that posits the overhuman (*übermensch*) and transhuman, be it through the will-to-power, eugenics, cyborg enhancements or bio-engineering. Throughout the seminar, we will turn to science fiction texts, television and films as our speculative guides to imagining alternative (post)humanisms, ending with a reflection on the science fictional utopias and dystopias that haunt the project of the human race.

## **HUM 2214** **SCHOLARSHIP: WAR, CONFLICT, AND HISTORY**

War has long played a central role in the human experience and in scholarship of history. Indeed, it might be said that the first "scientific historian" was the Athenian historian Thucydides, author of the *History of the Peloponnesian War*. If war no longer takes pride of place in most university history departments, it nonetheless remains a vital and lively source of scholarly debates. In this course, we engage with these debates, examining the variety of ways in which historians think about war, conflict and militaries. We touch not only on the domain of traditional military historians (those who study actual war, strategy and tactics), but also those who set war in a broader social context, and those who seek to understand war, conflict and violence through the lenses of memory and culture.

## **HUM 2215** **SCHOLARSHIP: THE PHILOSOPHY OF RELIGION**

Philosophy of Religion is a rich and storied combination of two important scholarship domains, Philosophy and Religion. Philosophers (often as theologians) and religious scholars (often as philosophers) have rigorously argued its central questions: What is religion? Does God(s) exist? What is the nature of God? Are there arguments for God's existence? What is the Problem of Evil? What are the roles of faith and reason? Is God necessary for meaning and morality? In the modern world, has the success of science explaining so much of our world (and universe) displaced religion, whether traditional or new variants? In this course, students develop scholarship skills through examining and participating in responses to these questions.

## **HUM 2216** **SCHOLARSHIP: FREEDOM, HAPPINESS AND THE SELF: ADAM SMITH AND JEAN-JACQUES ROUSSEAU**

Jean-Jacques Rousseau was the first great critic of modern commercial society. We are, he said, naturally good, free and happy, but modern society plunges us into deception and self-deception, manipulation, lack of freedom and misery. Adam Smith is the great celebrator of modern commercial society. He attempts to show how we can be both free and happy. But he was not a naïve advocate. He was aware of Rousseau's charges and devoted much of his work to responding to them. In the process, both ventured into discussion of the nature of the self, the structure of society and the nature of commerce. They argue over the role of reason and emotion in a good human life. They discuss many of the issues of modern politics: social inequality, freedom, democratic accountability, and the relationship of the state to the market. The hope of this course is that we can learn a great deal about the possibility of social equality, freedom, authenticity and happiness in our own commercial society from examining the scholarly clash of thought between a classic Romantic figure and a classic Enlightenment one.

## **HUM 2301** **CULTURE: CITIES, MAKERS OF MODERNITY**

In the eighteenth and nineteenth centuries, a curious thing happened: an age-old balance between large agrarian populations and small urban centres began to shift dramatically in favour of urban centres. Cities grew rapidly; this growth transformed the cultures of the cities – places like Paris, London and Vienna – but it also helped create

modernity. In this course, using the methods of cultural and social history, we examine the complex cultures of these modern cities. We look at the hopes that cities engendered in their populations – and examine the deep fears that the growth of cities provoked. What new pleasures did they provide? What new dangers did they create? And, throughout the course, we seek to understand how the city helped make modernity.

### **HUM 2302** **CULTURE: THE FABRIC OF REALITY** **ANTI-REQUISITE: FATE AND VIRTUE**

In this course, we will study a work of the first and greatest poet (Homer), two of the greatest philosophers ever to put pen to paper (Plato and Aristotle), and other texts from the ancient world. We will examine the question “How should we live our lives?” with a particular focus on the themes of fate and virtue. We will discover why every generation before ours has struggled with these authors, and develop our own relationship to their ideas.

### **HUM 2303** **CULTURE: PASSING (GENDER, RACE, CLASS, RELIGION)**

“Passing” typically refers to a social strategy through which members of a subculture or a minority assume the guise, habits or traits of members of a dominant social group. In this course, we will consider literary and non-literary examples of sexual, ethnic and class-related passing. After studying several famous examples of passing in the early modern period (e.g., transvestitism in Shakespearian drama; the case of the “Lieutenant Nun”), we will consider more modern manifestations of the phenomenon, not only in documentary works (Paris Is Burning; Black Like Me), but also in fiction and theater (Passing; The Great Gatsby; Six Degrees of Separation). “Passing” is not a course about strategies for getting ahead; it’s about the (in)stability of our identity categories. Part of the course will involve reflection on what it means to pass for who you are.

### **HUM 2304** **CULTURE: FEMINISM**

In this course, we look at the “F-word”—Feminism. What is the meaning and practice of feminism? What has feminism produced, and do we still need feminism or are we in a post-feminist era? Drawing on interdisciplinary approaches in Cultural Studies, this course will examine feminism as theory and practice. We begin by looking at the debates that framed feminism as a social movement from the early 20th century. We continue the ways in which feminist movement critically intervenes in analyses of institutions, policy and everyday culture. We will conclude the course with considerations of contemporary debates concerning feminism’s relevance through recent transnational feminist theory and practice. This course will introduce students to analyses of identity (gender, race, class, sexuality, ability and nation) that are situated in cultural theory and offer practice in employing theoretical approaches to examining our identities, lives and the ways in which we shape our community and world.

### **HUM 2311** **CULTURE: PHOTOGRAPHY AND CAMERA**

We take more photos in two days’ time than were ever taken in the 1800s. Our appetite for images seems unlikely to decrease. But this was not always the case. This course will chart how our love for and contempt of the photograph has played itself out since the time of Louis Daguerre, primarily in Western cultures. In this course, we will comment on photographic images from the 1820s to the present. Through a study of the ways in which photographic images are used, discussed and manipulated in treatises, the popular press and in literary works, we will examine the cultural suppositions that underpin photographic practice. While we will be learning something about photographic technique, the main goal of the course is to understand how we can talk about photographs, and how photography functions within society.

### **HUM 2312** **CULTURE: ROMANTICISM**

Romanticism—a late 18th- and early 19th-century movement in the arts—continues to shape Western culture in profound ways. Many of our current views (e.g., the role of art, the sanctity of the natural world, the importance of the individual and individual identity, the merit of competing political systems) have their roots in Romanticism. We will begin by examining Romanticism both as a reaction against, and an outgrowth from, the Enlightenment of the 18th century. We examine works of literature, music and painting by some of the most important figures of the nineteenth century, including Goethe, Beethoven and Turner.

### **HUM 2313** **CULTURE: THE IMAGE OF THE ARTIST**

Are artists creative geniuses? Craftspeople? Inventors? Outsiders? To what extent is art about self-expression? In this class, we will investigate the shifting nature of artistic personas from the middle ages to today by analyzing artists’ portraits, biographies, patronage contracts and instructional manuals. This course will include a number of practical projects that will help you to experience how art-making practices can shape identity. These will include: copying and using model books, fresco painting, the creation of perspective machines, using found objects, and automatism. No artistic skill required.

### **HUM 2314** **CULTURE: IDENTITIES**

Who are you? Why do you think that’s who you are? Who do others think you are? Why? Our identities are in large part the result of stories — stories we tell ourselves, stories others tell about us, and the interaction of the two. All of this takes place in social and political contexts of which we may be partly or even wholly unaware. This raises the possibility that we don’t actually know who we are. This course is an examination of some of the questions which stem from this, and some of the answers suggested by a variety of twentieth century Western authors. Our focus will be on exploration, rather than conclusion. There are better and worse approaches to, and interpretations of, both texts at hand and the contexts in which they were created, and we shall look at some of the reasons why this is the case. The course is divided into two parts: the first looks at questions of individual identity, and the second looks at some of the social and political forces which influence who we are and the choices we might make about who we want to be.

### **HUM 2317** **CULTURE: (E)UTOPIA & HIGHER LEARNING**

Using the methods of philosophical genealogy and the philosophy of culture, we will trace the threads of previous higher learning (e)utopias (actualized utopias) that are woven into the fabric of Quest University. We will trace (e)utopian higher learning from its roots at Antioch College and Berea College, through Black Mountain College and Johnston College, to Quest today, and then discuss what can be learned for Quest’s future.

### **HUM 2318** **CULTURE: CAPITALISM**

This class takes as its starting point the idea that capitalism is not merely an economic or historical phenomenon but is deeply ideological at its core and is thus inherently embedded in culture. In this sense, capitalism constitutes a semi-compulsory set of cultural ideals and structures to which we always already belong. During the Block, we will examine foundational theories of capitalism, including Marx, Weber, Adorno and other theorists of the Frankfurt School. As the course progresses, we will explore more contemporary interpretive frameworks for understanding the pervasive intertwining of capitalism and culture.

## **HUM 2319** **CULTURE: DISABILITY ARTS**

This foundation culture course asks students to engage with a range of artists who challenge and reframe perceptions of disability. Through collaborative and arts-based modalities, the course provides opportunities for students to appreciate, experience and critically engage with the work of these artists as they examine the social and cultural contexts and implications of these offerings. Students will explore how lived experiences of difference are being explored by disabled arts, dance and performance practitioners; the line between art and advocacy; and how, in these times of social/ecological crises, relationships to disability are being redefined through artistic response. This course will investigate how these artists are actively responding to and re-shaping culture.

Course Fee: \$10/ per student

## **HUM 2320** **CULTURE: THEATRE OF CRIME & HORROR**

This course focuses on cultural practices surrounding the creation, consumption and regulation of representations of violence, crime and horror. We will ask, why do people seek—and also seek to suppress—theatrical and cinematic representations of horrible acts? If such practices are harmful, why do we enjoy them? Where do different culturally and historically situated communities draw the line distinguishing what is inappropriate for public performance? And, what are the most effective tactics for staging horrific acts and events—and what “effects” are thus achieved?

## **HUM 2321** **CULTURE: PLAY AND PERFORMANCE ANALYSIS; OR HOW TO WATCH PLAYS**

This course focuses on the cultural practice of theatre—and more specifically, the practices of interpreting dramatic literature and live performance, and their relationship to each other. For example, is a live performance a representation of a written script—or vice versa? Methods of interpreting and engaging with other kinds of literature may not prove helpful when confronting drama, and our naturalized habits of viewing performance may lead to misinterpretation or confusion when we try to watch something from another time or place. This course equips students with a set of tools, skills and vocabulary to analyze plays and performances. We will study plays and performances from different eras and areas, emphasizing different ways of interpreting drama and theatre. We will use each different play to explore various ways of reading, analyzing and critiquing plays, always resisting the idea that there is a “right” way to analyze a play or a “correct” interpretation of a work of art, and challenging the impulse behind the question, “What does it mean?”

# **CONCENTRATION HUMANITIES**

## **HUM 3009** **DON QUIXOTE, LITERARY THEORY, AND THE PRACTICE OF LITERATURE**

*Prerequisite: Any Foundation Humanities course or Tutor permission.*

This course consists of a close reading in translation of Don Quixote, in conjunction with a variety of critical responses to Cervantes’s masterpiece. While our main goal will be an appreciation of the historical and social context in which Don Quixote first appeared, we will also examine different critical approaches to the novel as a whole (by critics such as Lukás, Auerbach, Bakhtin and Foucault), and to Cervantes’s work in particular. Finally, we will see how other authors (e.g., Jorge Luis Borges) have used the literary tools that Cervantes has provided them. All readings and discussions will be in English. Students who are already advanced speakers of Spanish and would like to fulfill the Foundation language requirement may do so by taking this course and completing written assignments in Spanish.

## **HUM 3010** **WOMEN’S VOICES**

Through selections from medieval through contemporary literature written by women, we will consider the question of whether there is a distinctly female authorial voice and how women’s literature might differently consider or express the human condition. Historical and theoretical readings will provide additional context for understanding women’s roles across time and cultures. Readings may include works by Aphra Behn, Madame de Lafayette, Jane Austen, Simone de Beauvoir, Virginia Woolf, Mariama Ba, Isabel Allende and Margaret Atwood.

## **HUM 3011** **DO-NOTHINGS: LOSERS IN LITERATURE**

*Prerequisite: Any Foundation Humanities course or Tutor permission.*

This course examines the lazy, the exhausted, the enervated, as well as those who, like Melville’s scrivener Bartleby, “prefer not to.” Working under the assumption that laziness is a particularly modern phenomenon, we begin our study with works like Keats’ “Ode to Indolence,” as well as descriptions of the indolence of the Spanish (Larra’s “Come Back Tomorrow”). We then move on to do-nothing clerks and government officials (such as Bartleby, or the nameless protagonist of Dostoyevsky’s Notes from the Underground), before considering the idle heroes of Huysman or Goncharov (Against Nature; Oblomov), as well as James’s scared bachelor (“The Beast in the Jungle”). After a detour through Walter Mitty’s brain and a visit to Vladimir and Estragon (Waiting for Godot), we look at some contemporary representatives of the do-nothing, by the likes of Ben Lerner, Adam Wilson and Upamanyu Chatterjee. Unlike the protagonists of the texts we will be reading, students in this seminar do a considerable amount of work.

## **HUM 3012** **SHORT LATIN AMERICAN FICTION**

*Prerequisite: Any Foundation Humanities course or Tutor permission.*

In this course, we will study Latin American short fiction, considering both condensed (the micro-story of Augusto Monterroso) and more expansive (novellas by figures such as Isabel Allende) fiction. Along the way, we will also discuss how Latin American narrative plays with time and space (in works by Jorge Luis Borges and Julio Cortázar), constructs identities and imagines politics (Rosario Castellanos, Juan Rulfo, and Roberto Bolaño), and dabbles in the fantastic (Horacio Quiroga and Gabriel García Márquez).

All fiction will be read in English. Students whose Spanish is advanced enough can take this course for language credit; please speak with the Tutor.

## HUM 3013 POETRY

English-language poetry is one of the glories of our common heritage. In this course, students learn about the essential building blocks of poetic language, such as the types of metaphor, the uses of imagery, English accentuation and meter, and stanza form. We read, recite, memorize and compose poems to comprehend and interpret them. Each student picks one poet of his/her choice to concentrate on for a class presentation and paper. Although this class assumes no prior knowledge, it moves quickly with the objective of giving students the tools to become self-assured readers.

## HUM 3014 ZARATHUSTRA: THE ART AND POLITICS OF THE OVERMAN

Part philosophical treatise, part narrative poem, part symbolist novel, and part verbal music, Friedrich Nietzsche's *Thus Spoke Zarathustra* is one of the most scintillating, outrageous, influential and misunderstood books of the 19th Century. In this class, we shall explore the entire work, discussing and analyzing the meanings and implications of such concepts as the Overman (or, as commonly translated, Superman), amor fati, Eternal Recurrence, and the Will to Power. We will then place these and the book itself into a larger intellectual, artistic and political context with interpretations and responses drawn from philosophy, music, literature and film. Besides *Thus Spoke Zarathustra*, readings will include additional works by such creators as H.G. Wells, Richard Strauss, Gustav Mahler, Alfred Hitchcock and others.

## HUM 3015 SHAKESPEARE: THEATRE AND PERFORMANCE

This field course takes up the interpretation of Shakespearean drama. We spend two weeks on campus in intensive preparation of five Shakespeare plays; for the third week, we then travel to the Shakespeare Festival Theater in Ashland, Oregon to see them performed live: *Henry IV, Part 1*; *Henry IV, Part 2*; *The Merry Wives of Windsor*; *Julius Caesar*; and a contemporary adaptation of *Measure for Measure*. We go backstage, talk to designers and actors and do an improv workshop. Students develop their own interpretations: What are the most important themes of a play? If you were a director, how would you stage it? How do you evaluate a live performance? For fun, we also attend contemporary performances as well, including Shakespeare in Love.

A \$950 fee covers all food, lodging, tickets, and transportation. (N.B.: the fee may vary depending on Quest's as yet unannounced budget for field trips.) You will not be considered fully registered until you have paid the non-refundable deposit. If you fail to deposit, you will be dropped from the class one week from the time you register on self-serve.

## HUM 3016 NOVELS: REALISM

The novel is the modern genre par excellence, taking up the representation of social milieu and private life. In this course, we read three masters of Realism, a term that describes fiction about characters, places and events that readers would think could actually exist without any phony heroism or romanticizing. Balzac's *Old Goriot*, Flaubert's *Madame Bovary*, and Tolstoy's novellas (*The Death of Ivan Ilych*, *Master and Man*, and *Hadji Murat*) are all timeless classics that every student of literature should know. Balzac's brilliant description of the human passions and dark Parisian corners served as the standard for a century of writers to follow. Flaubert's stylistic masterpiece changed forever the way authors think of prose composition, still inspiring admiration today. Tolstoy's ability to bring characters to life has never been matched. We explore in detail how these authors create gripping moral tales and realistic imitations of life.

## HUM 3019 NOVELS: MODERNISM

The course pairs Rainer Maria Rilke's only novel, *The Notebooks of Malte Laurids Brigge*, with Proust's masterpiece, *Remembrance of Things Past*. In the early 20th century, these authors turned away from traditional novelistic techniques as they tried to render the modernist shift in human consciousness toward intense, individual, poetic inner states. The result was both ground-breaking and enduring, changing our expectations for the genre of the novel, and opening up questions of time, memory, childhood, selfhood, and the relation of art to life.

## HUM 3020 TONI MORRISON: GENDER RACE STORYTELLING

Hailed as one of the most important contemporary novelists and the first Nobel laureate as an African American Woman, Toni Morrison writes with elegance, persuasion, compassion, and love that grip our heart. The themes and visions in her work are epic, yet her sentences and words are gritty and fragile. To encounter her storytelling is to ultimately embrace the listener's own identity in the human world.

This Humanities concentration course centres on close-reading of Morrison's major novels such as *The Bluest Eye*, *Sula*, *Song of Solomon*, *Jazz*, *Beloved* and etc., and explores three important theoretical questions: What is women's writing? Why do we care about race? How does storytelling relate to narratology? There will be research projects of literary and cultural criticism, as well as creative projects to reflect on our own relationship to gender, race and storytelling. This course especially welcomes avid readers and thinkers who cherish words in beautiful yet difficult novels that enchant us in challenging ways.

## HUM 3022 INTRODUCTION TO FRENCH LITERATURE: LAUGHTER

*Prerequisite: Sufficient language skills, as demonstrated in placement exam or in discussion with Tutor.*

This course provides a historical perspective on French literature through the study of a particular trait: laughter. While not every text studied in the course will be easily classified as comedic, each work will inform our understanding of laughter and its cultural functioning. Although this course is not a comprehensive survey of French literature, the chronological structure will help students to appreciate the evolution of the French language and of writing styles, the importance of historical and social context in reading literature, and the influence of classic French works on modern literary production. As an introductory-level literature course conducted in French, the course will also include lessons on the advanced vocabulary and grammar necessary for the comprehension and discussion of each work.

## HUM 3023 BIRTH OF THE READER

What does it mean to read? Beyond the everyday activity of recognizing letters and sounds, reading is an act of ascribing meaning to symbols. While these acts of interpretation may go generally unnoticed, our approaches to reading literary works quickly become complicated as we encounter and try to account for claims about individual taste, emotions and reactions. How do we talk about literature or validate our understanding of it on the unstable ground of a reader's personal response? What determines our criteria for "good," as applied both to literature and interpretations? The development of reader-response criticism has provided one avenue for addressing some of these questions, and the growing field of affect theory may also inform our thinking. In conjunction with the study of theoretical texts (by Fish, Gadamer, Holland, and Iser, among others), this course will engage in the question of reading through two principal paths, historical and literary. We will consider how the production and distribution of books has influenced reading practices, from the medieval scriptorium to the Internet, and we will analyze "scenes of reading" that appear in literary texts for the clues that fiction itself can furnish to inform our method.



## **HUM 3024** **ON THE BEAUTY OF WOMEN**

What makes a woman “beautiful”? How are beauty ideals defined and circulated within a culture? How do artistic and literary evocations of beautiful women project and shape broader cultural values about gender? This course uses the cultural environment of Renaissance Italy, particularly within the city of Florence, as a vehicle for exploring big questions about the aesthetics of femininity and the cultivation of feminine virtues. Our primary focus will be the study of representations of women by great artists like Sandro Botticelli and Leonardo da Vinci, which we will discuss in relation to several important literary trends of the Renaissance including etiquette and conduct guides, neo-Petrarchan poetry, neo-Platonic texts, and erotic literature. Topics will include theories of the gaze, the symbolic functions of fashion, cosmetics and feminine adornment, rituals of marriage and motherhood, and the classicizing nude.

## **HUM 3025** **FRAGMENTS OF INFINITY: THE SCOPE OF THE SHORT STORY IN ENGLISH**

Short stories range from basic genre pieces to complex description-defying exercises in literary virtuosity; from single-sentence mini-dramas to book-length explorations of multiple aspects of being human; from comedic sketches to the darkest of tragedies. In this course, we shall explore some of the many ways authors have chosen to compress their emotions, thoughts and ideas into brief fictional works. Readings will be drawn from the enormous range of short stories written originally in English by writers from around the world, reinforced where necessary by theoretical considerations of the essence and impact of the short story form.

## **HUM 3101** **HISTORY, HISTORIANS, AND HISTORIOGRAPHY**

What is history? What do historians do? In this course, we critically examine history itself: what it is and why historians do it. We seek to understand the assumptions historians make about the limits of our knowledge of the past. Topics include analyzing the questions historians ask, investigating the sources they use, and examining the ways in which historians borrow from, and contribute to, other disciplines. Students also consider a broad range of historical schools, beginning with Herodotus and working through Rankean empiricism, Marxism, the Annalists, microhistory, cultural history, and others.

## **HUM 3102** **COLONIALISM, RACE, AND IDENTITY**

In 1500, European states controlled roughly seven percent of the world's land; by 1914, the figure was closer to 85 percent. In this history course, we investigate this staggering transformation and examine its consequences for colonizer and colonized alike. We investigate the interaction between colonizer and colonized, study the collision between the lofty principles espoused by colonizers and the actual practice of colonialism, and examine the ways in which the historical experience of colonialism transformed the lives of people in both the colonies and in the metropolises. Along the way, we delve into topics including scientific racism, the development of the concept of the “civilizing mission,” and the rise of self-conscious nationalisms in the colonized world.

## **HUM 3105** **TOPICS IN MODERN EUROPEAN HISTORY**

In this course, students examine decisive moments in modern European history. The course provides students with the opportunity to use primary and secondary sources to come to a deeper understanding of the important themes of the modern world. Topics will vary, but may include the Scientific Revolution and the Enlightenment, the Industrial Revolution and development of capitalist and industrial economies, the rise of powerful states, and the development of liberalism, nationalism, romanticism and socialism.

## **HUM 3107** **CHIVALRY AND FEUDALISM**

Prerequisite: Foundation Humanities Texts course or Culture course

In popular culture, medieval Europe is understood in two almost diametrically opposed ways. On the one hand, it is imagined as a time in which courtly knights risked their lives on behalf of noble ladies; on the other hand, “medieval” is used as a shorthand for cruelty, brutality, and the abuse of the weak by the strong. Both views are simplistic, but rooted in aspects of genuine medieval life. We consider both the chivalric society imagined by courtly literature and the feudal society desired by medieval lords, along with the relationship between the two. We investigate topics such as the relationship between fictional portrayals of knighthood and the self-images of genuine knights, clerical and monastic attempts to use ideology to curb feudal violence, and the influence of such elite discourses on the peasantry. We read medieval texts such as Chrétien de Troyes’ *Cliges* and Geoffroi de Charny’s *Book of Chivalry* and modern scholarship such as Stephen Jaeger’s “Courtliness and Social Change.”

## **HUM 3110** **THE GREAT WAR**

A century ago, a war that contemporaries almost immediately dubbed the “Great War” roared across Europe and the world. The war—arguably the first total war—marked the defining moment of the twentieth century. Tens of millions of men were mobilized to fight in the bloodiest conflict the world had seen; millions of those died, were wounded, or taken prisoners; untold numbers suffered lasting physical and psychic traumas. Great swathes of land in France and Belgium were laid waste. Images of the conflict—the lunar landscape of No Man’s Land, seemingly endless tangled coils of rusting barbed wire, spectral figures of goggle-eyed soldiers in gasmasks, and muddy, rat-infested trenches—haunted the memories of those who had lived through it. But the war affected not just those who engaged in battle, but also those who stayed at home: women, children, the old and the infirm. In this history course, we will examine the Great War, not just through a study of military operations, but also through an examination of the social, artistic, literary and political responses to the conflict.

## **HUM 3111** **WAR, FILM, AND HISTORY**

Film has a powerful effect on the way we understand history, particularly the history of war. We study films that deal directly or indirectly with war. We explore the relationship between the past and its representation in film. Our goal is to set these films in their contemporaneous context, examine them as (problematic) historical works in their own right and compare them to conventional historical approaches. Films we study may include Sergei Eisenstein’s *Alexander Nevsky*; Jean Renoir’s *Grande Illusion*; John Cromwell’s *Since You Went Away*; Louis Malle’s *Au Revoir les Enfants*; Terrence Malick’s *The Thin Red Line*; Gilles Pontecorvo’s *The Battle of Algiers*; and Francis Ford Coppola’s *Apocalypse Now*.

## **HUM 3114** **SCIENCE, EXPLORATION, AND EMPIRE**

Prerequisite: Any Foundation Scholarship course.

European science grew up alongside European empires. We investigate European exploration and expansion from the sixteenth through the early nineteenth centuries from the perspective of the history of science. Investigate the entanglement of scientific discovery with imperial projects. We consider topics such as confrontations between ancient traditions and new discoveries, European attempts to assimilate non-European natural knowledge, and the recruitment of science as a tool of the imperial state. Case studies of the writing and experiences of the Spanish missionary José de Acosta, the German painter Maria Sibylla Merian, and the English gentleman Joseph Banks provide a lens for discussion of the broad themes of the class. Students will also choose their own case study to research throughout the course.

## **HUM 3115** **SLAVERY, DEMOCRACY, AND CAPITALISM**

*Prerequisite: Any Foundation Culture course*

The origins of modern democracy and global capitalism are deeply tied to the institution of slavery. Slave-produced sugar and cotton provided crucial raw material for the mills of early industrial economies, and it was quite possible to champion universal freedoms while profiting from the labour of slaves or owning slaves oneself. This course examines the connections among slavery, democracy and capitalism in the Atlantic world from the early seventeenth through the mid-nineteenth century. Students will engage in a series of projects that take expanding perspectives on the slave system. We begin with the experiences of slaves themselves and the structure of slaveholding societies. We continue by examining the relationship between slavery and the emergence of democracy through the lens of developing notions of rights and citizenship. Finally, we conclude by investigating the importance of slavery to the emerging system of global capitalism.

## **HUM 3117** **ETHNOGRAPHY OF SQUAMISH CULTURE**

Ethnography of Squamish will consider dilemmas, practices and implications of ethnographies of the unceded Coast Salish territories, both historically and in the contemporary moment. Reading several works by scholars that have shaped—negatively and less so—the perceptions and experiences of the people and their land, we will contemplate the roles of ethnography and the academic in struggles and studies. As such, the goal of the course is to provide space for students to be cognizant of their inheritance from past academic work, reflect on the impacts of academic research and to shape ethical practices in contemporary research.

## **HUM 3118** **SITES OF HISTORY: FRANCE**

This course, taught in France, explores the trials, tribulations, and triumphs of modern France from 1870 (the outbreak of the Franco-Prussian War) to the end of the twentieth century. What better way to understand the bohemian life of the Belle Époque than to walk up to the top of the Butte Montmartre? What better way to understand the impact of urban transit than to experience the Paris Métropolitain in all its crowded glory? What better way to understand the crisis of the Great War than to journey to the fortress city and ossuary of Verdun? What better way to understand the centrality of art and culture to the French than to take in the museums of Paris? Participants in this course will learn about—and experience—the history and culture of modern France.

## **HUM 3120** **ISLAM AND MUSLIMS IN CHINA**

An introduction to 1,200 years of Muslim life in what is now the People's Republic of China. Beginning with an overview of Islam, a world religion, and its eastward transmission, we will create narratives of the formation of culturally Chinese Muslim communities ("Hui"). For comparison, we will examine parts of Islamic Central Asia incorporated into the Qing empire (1636-1912) and thus included in modern China. The course focuses on interpretive complexities in the histories and positions of Muslims in China down to the present day. Students will research and analyze primary and secondary sources for their essays.

## **HUM 3206** **ANCIENT PHILOSOPHY**

*Prerequisite: Any Foundation Humanities course*

Ancient philosophy is framed by three principal questions: how do we know? (analytics); what is there? (metaphysics); and how should we act? (ethics). In this course, we learn how three great figures of the classical period, who are also acknowledged as the greatest philosophers of all time, addressed these questions: Socrates (469-399 BCE), Plato (427-347 BCE), and Aristotle (384-322 BCE). These thinkers decisively influenced our intellectual tradition, and it is impossible to speak of Western civilization or Western thought without reference to them. They asked all the important questions and they each gave us arguments and answers that have stood the test of time. They shaped the fundamental categories and conceptual language that we use to understand the world around us. We investigate a range of topics including the nature of the soul and its relation to the body, the acquisition of knowledge and wisdom, causal explanation in natural science, and what it means to live the good life.

## **HUM 3207** **LOGIC & METALOGIC**

*Prerequisite: Any Mathematics course*

This is not a typical class in formal logic or informal argumentation. It is more like a cross between Spherical Trigonometry (high-powered mathematics) and Phenomenology (high-powered philosophy). The paper we are going to study is one of the most important and influential that has ever been written: 'On Computable Numbers, with an Application to the Entscheidungsproblem,' by Alan Turing (1936).

This 36-page paper proves something very interesting and important. We usually think we have made progress in solving mathematical or logical problems when we come up with a method (or algorithm). When you were young, you learnt a method to subtract one number from another. Later, you learnt a method to solve for the unknown in a quadratic equation. But what Turing shows is that there is a large class of mathematical and logical problems that cannot be solved algorithmically. By this, we mean not merely that we do not know what the method is, but that no method will ever be found!

This result has profoundly changed our understanding of logic, mathematics and computation. It means there is no universal method for classifying a theorem of first-order logic as being either true or false (though there is always an answer). It also means that a computer cannot write down the vast majority of numbers, even given infinite resources and infinite time.

## **HUM 3208** **MODERN PHILOSOPHY**

Modern Philosophy is not a common set of views or interests, but an approach to philosophical questions characterised by the development of powerful logical techniques to achieve definite answers. It emphasises precision and thoroughness about narrow topics as opposed to vague discussions about broad topics, and in the last century has become the dominant force within Western philosophy. In this course, we will explore select problems in metaphysics, epistemology, philosophy of mind, philosophy of language, or philosophy of science, in the analytic tradition.

## **HUM 3209** **PHENOMENOLOGY, EDUCATION, PLACE**

Through fields of study including phenomenology (the study of experience) and philosophy of education, this course examines relationships between experience, education and place. The course begins by examining the nature of experience through phenomenology, asking questions including: What is experience? How do we make sense of the world around us? How do our past experiences affect our perceptions and decisions? These insights are then explored in the context of the philosophy of education and curriculum design, asking questions including: How do we learn? What is the purpose of education? Underlying these explorations are different senses of the word 'place,' including the effect of place on experience, the place of education, and the influence of place on learning.

## **HUM 3305** **WORN TO BE SEEN: SCULPTURAL FOOTWEAR**

From pageantry to physical performance, shoes are created and worn for a myriad of reasons. This class will explore the many types and purposes of footwear, with a specific focus on not just the wearing, but the viewing of them. Drawing upon visual cues of footwear across time and elements of visual art, students will create soft shoes that will be nailed, sewn, screwed, tied, glued, or otherwise adhered to a sculptural base of their design. Each student will create shoes that are conceptually driven and expertly crafted to create performative shoes that are worn to be seen.

*Note: There is an additional \$40 materials fee*

## **HUM 3307** **ART & ARCHITECTURE IN PARIS**

The purpose of this field class in Art History is to teach students how to respond intelligently to a work of visual art or architecture, and ultimately how to make a cogent interpretation of it. The course takes place in two parts. We first meet for nine days on campus in an intensive study of theory, and in preparation of particular works that we will then go see in situ. After a travel break, we reconvene in Paris for the last two weeks. The rationale for a field excursion is simple: by walking out the door, we have access on foot to a gothic cathedral in five minutes, and the newest Frank Gehry building in a 20-minute metro trip. The Louvre—the world's largest art museum—is likewise only a 15-minute walk away. By preparing the background ahead of time on campus, we will arrive in Paris knowing what works we want to see, and what we are looking for.

## **HUM 3309** **CHARACTER DESIGN**

The class will provide a visual foundation upon which to sculpt a fictional character. We will first explore the definition of character, and then embark on a journey of taking an initial concept through to physical creation. Students will have the opportunity to hone their skills in storytelling by creating their own film outlines, as well as learning to sculpt from a live model.

## **HUM 3310** **SCULPTING, ON THE COMPUTER**

This course is a digitally intensive Block developing sculpting skills where your computer replaces clay. Modelling is the CG (Computer Graphics) term for creating three-dimensional art on the computer. This class takes you through the basics of organic polygonal modeling in Maya, texture mapping and an entry into zBrush and character creation. In this practice-based Block, students begin by mimicking a series of demonstrations. We build a series of assets together and then you will have a chance to make something yourself. A lot of sculpture knowledge is packed into this course, as modelling and sculpting work with the same principles. Additionally, modelling is the foundation for all other CG modules, including: animation, look

development, texturing, and rendering. Developing the artistic skills of modelling provides foundational skills for students leaving the course to comfortably self study and develop further in other areas. Students will also achieve a clearer understanding of gaming, VR, and feature film VFX. Requirements: You will need a computer with 8gigs of ram minimum and be able to load Maya and zbrush on your machines.

## **HUM 3344** **PLAYING FOR LAUGHS: THEORY & PRACTICE OF COMIC PERFORMANCE**

Comic performance exists throughout humanity, yet despite its broad appeal and high level of technical, philosophical, and ethical complexity, it has mostly been overlooked and ignored by "official" culture. Historically, when intellectuals have considered creative arts at all, they have privileged writing over performance, and tragedy over comedy. Comedies and comic performers rarely win the most coveted awards in their disciplines, and historically, comedians often literally were, or symbolically represented, social outcasts. While times have changed, it's still probably safe to say few parents hope their children will go to university to become comedians. Yet here we are...

This course challenges the notion that comedy is trivial. Students will explore comic performance in theory and practice, investigating a range of historical and contemporary forms and techniques and learning to practice comic performance as a means of pursuing rational inquiry, articulating critical insights, and developing confidence, self-efficacy and resilience.

## **HUM 3350** **CREATIVE WRITING**

"Nobody can teach you how you, in particular, are going to behave when you're alone for hours a day over long periods of time trying to deal with unknown quantities," said Michael Ventura in his 1993 piece, *The Talent of the Room*. Nobody can teach you who you are when you're alone in a room with your blank screen, nor how you choose your words. We will focus instead on what can be taught: How to read creative work closely and critically. How to listen. How to receive criticism graciously. The terms of the art and of rhetoric. The rules of verse. The rookie mistakes, and how to avoid them. How to use these rules and constraints to free your imagination. At least twenty exercises, one of which will always get your words flowing. Readings will include Marcel Bénabou, William Burroughs, Harry Crews, A. E. Housman, Mary Oliver, Georges Perec, Raymond Queneau—but all these only lightly. Mostly we will be reading each other. Expect to emerge from this Block, blinking, with 50 pages of writing you like.

## **HUM 3366** **SONGWRITING AND RECORDING**

*Prerequisite: Any Foundation Humanities course*

This course explores the role of song in societies past and present, the techniques and creative process of songwriting, and the process of recording in a digital studio. The practice of song-writing—setting text to music—spans human history and cultures. This course examines song throughout history from plainchant to 19th century art song, and Bob Dylan to Jay Z. We will examine historical, textual, and analytical perspectives, to learn about the creative process and develop compositional approaches to songwriting. Through working in the digital studio, students extend the compositional process from the arrangement of a melody and chordal accompaniment to the creation of completed recordings. Rudimentary background in music theory is highly recommended.



## **HUM 3369** **MUSICAL IMPROVISATION**

In this course, students develop musical improvisational abilities through the application of music theory to specific musical genres. The primary musical genre explored in this course is jazz, but there will be opportunities to examine and undertake improvisation in genres ranging from the baroque era to jam bands. In addition to applied improvisation, students examine larger questions about improvisation, including: what is improvisation? Is improvisation different from compositions? How does improvisation relate to other social practices? It is highly recommended that students have some background in music theory rudiments and some ability to play an instrument.

## **HUM 3372** **MUSIC IN THE 20TH CENTURY**

*Prerequisites: A Culture and a Scholarship Foundation course*

The 20th century witnessed events from world wars and revolutions to technological developments, and the questioning of human nature, to the development of a global economy. The big question asked in this course is: How do the arts participate in social, cultural, ethical and political changes? More specifically, we'll be looking at the role of music in the major changes of the twentieth century. Even more specifically, we'll examine popular and concert music in the West through several lenses, including musicological and historical inquiry, close listening, composition and musical analysis. Musical genres under examination range from jazz, popular music, experimental music, and music for the concert hall.

## **HUM 3382** **FEMINIST ARTS PRACTICES**

This course analyzes the relation between politics and performance to uncover the ways arts-practices respond, embed and evoke issues of power and bring attention to varied notions of justice. We will challenge ourselves to move, make, talk and write, and as we do, we will explore some central concerns in feminist movement, examining theories and practices of feminist art making over the past century in multiple disciplines and methods, including dance, photography, sculpture, film/video, performance, and other media. We will explore experimental and interventionist productions, including institutional critique, through which feminist arts practices comment and challenge art world structures of education, circulation and collection, and in the world at large. Through rigour and commitment to play and practice, we will bring our imagined and creative works into material and embodied reality and consider new ways of knowing. Be prepared to read, write and move in this class.

## **HUM 3383** **VIOLENCE, TRAUMA, AND REPRESENTATION**

This course is an examination of violence and trauma, and their relation to, incorporation in, and treatment within modes of academic study, performance and visual arts. We will read prolific and contemporary texts that address treatments of violence, trauma and memory. Simultaneously, we will also consider the relationship between trauma and modernity. Themes of discipline, subjectivity, migration, and exile will be considered as we engage with artists and scholars who consider the complexity of understanding and conveying the trauma of violence.

## **HUM 3385** **CULTURAL APPROACHES TO DANCE STUDIES**

This course will focus on the study of dance practices in and across cultures, including cross-cultural studies of dance; multicultural approaches to dance history; ethnological, ethnographic and cultural studies approaches to dance analysis; and analysis of the different roles and functions dance plays in cultural systems. This analysis will guide our examinations of dance; aid in honing our skills for viewing, understanding, verbalizing and writing about performance; and help situate our own work (choreography/written discourse) within broad

analyses of culture. We will locate dance-making and history-writing within larger political and cultural discussions.

## **HUM 3391** **THE ART OF THE BOOK**

Make and study beautiful illustrated books that tell stories through text, image, and the material form of the codex. From papermaking and calligraphy, to painting and binding, this course explores art books as sophisticated intellectual technologies as well as tools for artistic expression. Over the course of the Block, we will explore the history and development of the illustrated book, including the invention of the codex, medieval manuscripts, pop-ups and graphic novels. You will learn how to make ink, write with quills, and bind, design and illustrate your own books.

## **HUM 3392** **PSYCHOLOGY OF ART: YOUR BRAIN ON ART**

In this course, we will study the roles that art can play in our mental and emotional lives. What can the analysis of art teach us about our own brains? How have scholars in the past articulated the relationships between art and the mind? Throughout the Block, we will study a range of approaches, including Freudian and Jungian theories of art, contemporary studies of art and cognition, and new research on the topics of art therapy (including the adult colouring craze) and the intersection of aesthetics and marketing.

## **HUM 3393** **THE DESIGNED NARRATIVE: STORYTELLING THROUGH VISUAL COMMUNICATION**

Experiencing a story can be a visceral experience. By blurring the lines between design and narrative, this course will delve into the powerful and subtle ways of enhancing, altering, shaping, contorting, and otherwise influencing the reader/user experience with design. We will cover 2-D design basics, simultaneously exploring various implicit and explicit methods of expressing a story. Please expect to complete daily design and narrative assignments, weekly individual and group presentations, and an incredible final project.

## **HUM 3394** **CABINET OF CURIOSITIES**

If you were to design your own museum, what would you display—and how? Museums and galleries are storehouses of wonder, full of artistic treasures, important cultural artifacts, and even the occasional “oddy.” In this class you will visit exhibition spaces and learn strategies for making your experiences of art more meaningful. You’ll also construct your own Cabinet of Curiosities or Micro-Museum to practice your curatorial skills, exhibit treasures, and tell your own story.

## **HUM 3704** **WHAT ARE WE TO DO WITH OUR LIVES?**

The implications of Darwinian evolution for human aspirations are profound. No writer confronted them more directly, or with more varied responses, than the English novelist, historian and journalist H.G. Wells. From the early science fiction novels, which have shaped the ideas of readers for generations, through the great comic novels of the early 20th century, to the histories and utopias scattered throughout his career, Wells offered and examined multiple answers to the question (itself the title of one of his books) which guides and shapes this course. We will read and discuss several of Wells’ major works, exploring competing visions of human possibility at both the personal and the societal level, before arriving at the beginning of an understanding of our own choices and their implications for ourselves and for our societies. Along the way, we shall discover some of the many reasons why George Orwell asserted that “The minds of us all, and therefore the physical world, would be perceptibly different if Wells had never existed.”

## HUM 3902 TESTIMONIALS

What does it mean to testify to historical events? How does one textually represent presence? And how do the multiple dialogues that are often part of the testimonial genre engender belief in the truth claims of testimonial narrative? Using theoretical approaches that emerge from anthropology, cultural studies, literary theory, and philosophy, we consider examples of testimonial, the testimonial novel, and testimonial filmmaking. Works confront topics as diverse as the conquest of the Americas, the institution of slavery, the Holocaust, and dictatorial abuses in Latin America.

## HUM 3903 CLASSICS IN THE AEGEAN

The key to a classical education is having exposure to the classical world. Few experiences are as enriching to the mind as visiting the legendary sites of the Aegean, and having the opportunity to read, write, travel, and learn in the cradle of civilisation. Under the guidance of an experienced Tutor, this journey can be one of the most rewarding parts of the university experience. Imagine having for your classroom one of the seven wonders of the ancient world, the Temple of Artemis at Ephesus; or participating in a lecture on Aristotle amongst the ruins of the Athena Temple at Assos, where Aristotle himself walked.

Participants in this course will learn about the philosophy, literature, history, architecture and culture that laid much of the foundation for Western civilisation. Students will begin the course at Quest, preparing for their sojourn in the Aegean region of Turkey. The overseas component of the course will comprise a series of presentations and discussion.

## HUM 3905 CRITICAL THEORY OF TECHNOLOGY

What is technology? How does technology shape this brave new world, and our perception of it? At least since industrialisation, the “question concerning technology” has troubled social theorists and philosophers concerned with one of the central questions of (post)modernity: whether autonomy is possible in a technocratic society governed by regimes of automation, cybernetics, digital surveillance, biotech, and artificial intelligence. This course introduces the intersecting fields of critical communication studies and philosophy of technology, developing its themes through Marx, Heidegger, the Frankfurt School, and Canadian communication studies (Grant, Innis, McLuhan), before turning to approaches from poststructuralism, cyberfeminism, Afrofuturism, actor network theory (ANT) and science and technology studies (STS). We will investigate the relationship between technology, time, and space; perception and identity (race, gender and being); and ideology and the utopian political imagery in media, film and science fiction, including a case study of a technological object.

## LANGUAGES

### LAN 1001 FRENCH 1

*Prerequisite: Tutor permission.*

Designed for students with no previous experience with French, this course introduces foundational concepts of French grammar and builds competency in all four areas of communication: listening,

speaking, reading and writing. French 1 provides in-class immersion and requires significant extracurricular engagement with the language. Students explore francophone cultures through short readings, music and film. Topics covered: regular and irregular verbs in present tenses, structures for interrogation and negation, gender and number agreement with nouns and adjectives,

vocabulary and expressions for discussing agreement, hesitation, certainty, family, hobbies, professions, school, personality and appearance.

### LAN 1101 CHINESE 1

*Prerequisite: Tutor permission.*

Welcome to the study of Chinese, the most commonly spoken language in the world. In Chinese 1, students develop elementary-level skills of listening, speaking, reading, and writing in Mandarin Chinese in everyday communication settings. Fundamentals of pronunciation, grammar, and Chinese characters are introduced, since Chinese is an idiographic language. Students also venture into the exciting world of Chinese culture. Chinese 1 is for students who have had no prior exposure to the Chinese language.

### LAN 1201 SPANISH 1

*Prerequisite: Tutor permission.*

Spanish 1 is an intensive, integrated-skills approach language course designed for students with no formal training in Spanish. Instruction is entirely in Spanish, and is focused on developing proficiency in listening, speaking, reading, writing and culture. Success in this course requires a significant time commitment outside of the classroom. Success in this course also requires open-mindedness because learning a language is an invitation to a new way of thinking. Topics covered include: greetings and self-description, vocabulary related to everyday life, elementary cultural topics, adjective-noun agreement, present tense conjugation, cardinal numbers, and elementary pronunciation. By the end of this course, successful students will be able to communicate in rudimentary ways and understand simple, adapted speech and texts. A minimum grade of C in this course is required to take Spanish 2.

### LAN 1301 LATIN LANGUAGE

The study of Latin unlocks the literary, philosophical, scientific and religious texts that continue to have an incalculable influence on our civilization. The aim of this course is to teach you how to read Latin as quickly and enjoyably as possible, within the context of Roman culture. The dialect of Latin we shall learn was spoken and written in Rome from the Late Republic to Early Empire (around 75 BCE to 300 CE).

In addition to learning Latin, you will gain a more complete and deeper understanding of your own language, and of the importance of language as a tool, not only for expressing complex ideas, but also for creating them. You will also gain insight into the origins of the Romance

languages (French, Italian, Spanish, Portuguese, and others). And you will learn that you use Latin every day, without even thinking about it. Perhaps most importantly, you will be following the educational ideals of Winston Churchill: "I would make them all learn English, and then I would let the clever ones learn Latin."

### **LAN 1401 ANCIENT GREEK LANGUAGE**

The study of Ancient Greek unlocks the literary, philosophical, scientific and religious texts that continue to have an incalculable influence on our civilization. The aim of this course is to teach you how to read Greek as quickly and enjoyably as possible, within the context of Greek culture. You will gain a more complete and deeper understanding not only of some of the greatest thinkers in history, but also of your own speech, and of the importance of language as a tool not only for expressing the complex ideas, but for creating them. As a bonus, you will also gain insight into scientific and medical terminology, be able to get around the subway in Athens, and participate in Greek soccer chants! And you will learn that each of you uses Greek every day, without even thinking about it. Perhaps most importantly, you will be following the advice of George Bernard Shaw: "Learn Greek; it is the language of wisdom."

### **LAN 1501 GERMAN 1**

This course is an intensive introduction to elementary German language and culture intended for students with no previous experience. Instruction will be entirely in German and will focus on developing competency in listening, speaking, reading, writing and culture. Students will engage with various cultural topics, readings, music and videos, both in and outside of the classroom. There will be a strong emphasis on the functional use of German to communicate in an immersion setting, such as short-term study abroad or travel in Germany, Austria and Switzerland. Students will learn to communicate about themselves and interact with German speakers in rudimentary ways. Course competencies will include counting, present tense conjugation, vocabulary and noun genders for food and accommodations, using objects and cases, as well as an awareness of basic cultural differences among German-speaking countries.

### **LAN 2001 ACCELERATED FRENCH 1 AND 2**

*Prerequisite: Instructor permission.*

Accelerated French 1 and 2 is intended for students who have had previous, but perhaps not recent, exposure to French or who have had little practice with oral communication. The course offers a fast-paced review of foundational concepts in French grammar, including regular and irregular verbs in present, past and future tenses, structures for interrogation and negation, noun and adjective agreement, and pronoun usage. Students review and expand vocabulary used for self-description, families, professions, school and daily activities. Conducted entirely in French, Accelerated French 1 and 2 helps students build competency in listening, speaking, reading, and writing French and requires significant extra-curricular engagement with the language, including group practice sessions before class each morning. A minimum grade of C in this course is required to take French 3.

### **LAN 2002 FRENCH 2**

*Prerequisite: French 1 (LAN 1001) or Tutor permission.*

Designed for students with some previous French, but little experience understanding and using spoken French, the course reviews foundational concepts of French grammar and builds competency in all four areas of communication: listening, speaking, reading and writing. French 2 provides in-class immersion and requires significant extracurricular engagement with the language. Content about

francophone cultures is included in the form of short readings, music and film. Topics covered: present, past and future verb tenses, the use of pronouns for avoiding repetition and constructing more complex sentences, and structures for expressing hypotheses and conditions. Students review and expand vocabulary for family, hobbies, professions, school, personality and appearance, and are encouraged to develop vocabulary related to individual interests.

### **LAN 2101 CHINESE 2**

*Prerequisite: Chinese 1 or Tutor permission.*

Chinese 2 is a continuation of Chinese 1 and provides further instruction in higher levels of grammar and Chinese characters. In Chinese 2, students continue to develop the four areas of communication: listening, speaking, reading and writing.

### **LAN 2201 SPANISH 2**

*Prerequisite: Spanish 1 or Tutor permission.*

Spanish 2 is an intensive, integrated-skills approach language course designed for students with the equivalent of one Block/semester of college Spanish. Instruction is entirely in Spanish, and is focused on developing proficiency in listening, speaking, reading, writing and culture. Success in this course requires a significant time commitment outside of the classroom. Success in this course also requires open-mindedness because learning a language is an invitation to a new way of thinking. Major topics covered include: vocabulary related to daily life in Spanish-speaking cultures, the past tense, commands, and the subjunctive. This course fulfills one Block of the Quest University language requirement. A minimum grade of C in this course is required to take more advanced Spanish courses at Quest University.

### **LAN 2501 GERMAN 2**

*Prerequisite: German 1 or instructor permission.*

This course is an intensive exploration of elementary German language and culture intended for students with some previous high school German, basic heritage speaking ability, or the equivalent of one Block/semester of college German. Instruction will be entirely in German and will focus on developing more extensive competency in listening, speaking, reading, writing and culture. Students will engage with various cultural topics, readings, music and videos, both in and outside of the classroom. There will be a strong emphasis on interacting within a German-speaking immersion setting such as extended travel or study abroad. Students will learn to communicate in German about their actions, their environment, and their intentions. Course competencies will include questioning and replying, sentence structure and complex verbs, the past tense for speaking, and cultural conventions appropriate for living and studying in a German-speaking country.

### **LAN 3001 FRENCH 3**

*Prerequisite: French 2 (LAN 2002) or Tutor permission.*

Designed for students who have previously studied French and who can understand and use basic spoken French, the course reviews foundational concepts of French grammar in a communicative and immersive setting and builds competency in all four areas of communication (listening, speaking, reading and writing). In French 3, students develop comfort and accuracy in the use of basic grammar and study more advanced structures (e.g., compound tenses, subjunctive). Short readings, music, and film help students to expand their vocabulary and knowledge of francophone culture and to become more comfortable with authentic, rather than textbook, use of the language.

## LAN 3102 LA NOUVELLE IN FRENCH LITERATURE

*Prerequisite: Tutor permission.*

Successful completion of this course satisfies the Foundation Language requirement.

What can be captured in a short story? Just a few pages can communicate the story of a whole life, an entire society, or the complexity of the human psyche. In *La Nouvelle* in French Literature, students investigate a broad range of topics that take us from the bawdy world of the medieval fabliaux to current commentary on life in francophone Africa. Students learn literary history as they explore the definition, characteristics and variations of the short story genre. Conducted in French, this course offers students an opportunity to continue developing their language skills while also discovering the richness of French and Francophone literature, including works by Balzac, Flaubert, Merimée, Yourcenar and Dongala.

## LAN 3201 SPANISH 3: SPANISH THROUGH HISPANIC CULTURES

*Prerequisite: Spanish 2 or Tutor permission.*

In this course, we will explore the diversity of Hispanic cultures in the Americas, Spain and Africa. Students will discuss current events, literature, art, music, history and film, to increase their proficiency in the Spanish language. Themes covered in the course will vary, but a goal of the seminar will be to familiarize students with some of the features of, and issues within, Hispanic cultures.





# INTERDISCIPLINARY COURSES

## **IND 2100 CORNERSTONE: WHAT IS KNOWLEDGE?**

The Cornerstone block is the first course that all students take upon entering Quest. The purpose of Cornerstone is twofold: to introduce students to Quest, and to investigate a significant question through a variety of academic perspectives. The question for Cornerstone is: what is knowledge? By investigating this question, we explore the unexamined principles and assumptions that underpin our views on science and culture. When we classify something as knowledge, we are implicitly appealing to a system of values: what is knowable is worthwhile, if not for its own sake, at least for its utility. For example, we believe that astronomy expands what we know, but astrology does not. But why? To respond that the former is science while the latter is nonsense merely reiterates the view that the one is knowledge and the other not, and so fails as an answer. We make progress on this question by investigating three sub-questions: (i) what assumptions do we have about knowledge; (ii) what is scientific knowledge; (iii) what is knowledge itself? In answering each of these, we are better able to say what knowledge is.

## **IND 2200 FOUNDATION RHETORIC**

All scholars read and write, make presentations of their findings, and engage in other rhetorical pursuits to participate in academic and public conversations. These conversations require that they make different kinds of compelling arguments—written, verbal, and visual—to particular audiences. Rhetoric at Quest is primarily designed to help students at all levels become better participants in these scholarly and community interactions.

## **IND 2250 INTRODUCTION TO QUANTITATIVE REASONING**

*Please speak with your Advisor and with the Quantitative Reasoning Coordinator (Chris Stewart) if you are interested in being registered in this course.*

The ability to understand and analyze the implications of quantitative information is essential for engaged participation in today's society, and rhetorical arguments are enhanced by the clear and accurate presentation of quantitative information.

This course is designed for those who would like to develop their understanding of, and confidence with, elementary quantitative skills used in the sophisticated contexts of adult life.

During the course we will examine all the skills included in the Q Skills Program (Number, Graphs, Algebra and Measurement) and apply them to a variety of situations. Although taking this course does not guarantee completion of all Q Skills strands, there will be opportunities to write the Q Skills Diagnostics.

In order to allow time for sufficient interaction with peers and the course tutor, it is expected that you will be available for the majority of the time between 9 am and 4 pm each day of class.

## **IND 2300 QUESTION**

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

At the end of their Foundation Program, Quest undergraduates work with a faculty advisor to submit a statement of their "Question": a two-page proposal describing a topic of special interest to them. The Question guides students' attention in a sustained and rigorous intellectual inquiry during the final 16 concentration blocks. The proposal may take the form of a statement or a question or even a set of related questions. For example, one student might be interested in the broad thematic question, "What is honour?" Another might choose a specific policy topic like, "How does politics influence the treatment of global epidemics such as malaria, SARS or AIDS?" With the Question program, students construct a major that suits their curiosities, rather than refine their interests to fit into a set major.

## **IND 3000 KEYSTONE**

*Prerequisite: Completion of Touchstones*

The Keystone course is required of all graduating students, and provides students with a capstone experience during which they will polish, prepare, and reflect: 1) students put the finishing touches on their Keystone projects; 2) students prepare and deliver a public presentation about their Question to the University community; 3) students take some time to reflect more broadly on their education—both prospectively and retrospectively—in hopes of understanding how a liberal arts and sciences education has changed them, and how they will integrate that learning into their future plans. The course includes a one-day retreat that will focus on preparing students for success in Keystone and in their careers post QUC.

## **IND 3002 EXPLORING THE ECOLOGICAL SELF**

This course explores the human relationship to nature through readings, discussions and experiential exercises. Students first examine the root causes of our environmental problems through the fields of deep ecology, eco-feminism and eco-psychology, and then apply these concepts to how we currently attempt to “manage” the natural environment. During a 12-day backcountry trip in the Brooks Peninsula, students examine how contextual forces influence their perspectives on the environment and how one perceives their relationship to nature. During the backcountry trip, students are asked to observe shifts in behaviour, community dynamics, attitudes towards nature and emotion in themselves and their peers.

## **IND 3106 GEOGRAPHIC INFORMATION SYSTEMS (GIS) IN MULTIDISCIPLINARY STUDIES**

GIS is computer software used to analyze digital layers of a map embedded with a wide variety of geographic information. The information on each layer could be economic, social, geological, ecological or biological. By combining and comparing different layers, students are then able to answer a variety of questions. For example, a student can assess the effects of climate on social and economic conditions among different regions; the relationship between solar radiation inputs on incidents of a certain type of disease across Canada; the feasibility of developing a new ecologically-sensitive mountain biking route in Squamish; or the potential threats of development to ecologically sensitive areas and endangered species. Through this introductory GIS course, students learn fundamental GIS skills in Arc GIS as well as develop creativity and problem-solving skills in their chosen field.

## **IND 3111 SEX, GENDER, AND SEXUALITY**

Sex, gender, sexuality: what do they mean? This is an interdisciplinary course taught from biological, and psychological perspectives. What is sex, and how is it determined across the major domains of life? How do humans and other vertebrates express gender and sexual orientation? How might we deconstruct our normative understandings of orientation, gender, and even sex, to make room for new ideas? This course includes challenging primary readings and other materials to facilitate our understanding of sex, gender and sexual orientation.

## **IND 3118 JOURNALISM**

Journalists are key players in how we understand our world as it happens, by defining what information reaches the public and how it's presented. How do specific articles make their way into media? What is the role of narrative in how we understand our society? What do journalists consider truth, and how do their research techniques and editorial choices reflect that? Students will examine themes of truth and narrative through readings, discussions, and field trips to observe working journalists. Students are expected to pursue their own original journalistic research and writing and will complete a publishable feature-length article which they will be encouraged to submit to a professional periodical for publication.

## **IND 3123 INTEGRATED RESOURCE MANAGEMENT**

Integration. Natural resources. Management. What do these terms mean? Together, what does Integrated Resource Management (IRM) mean...if anything? Through a variety of exercises and field trips, we will explore what IRM is and what makes for good IRM practice and policy, with a focus on examples in BC and Canada. We will emphasize specific topics such as: values and utility; common resources; First Nations rights and access; cumulative effects; and climate change. Many exercises will focus on effective negotiation skills and interpersonal relationships, as these are essential to IRM. (You will be amazed by how many important decisions are made or not made due to people having their feelings hurt!)

## **IND 3139 SOUND AND SPACES: AURAL ARCHITECTURE AND ACOUSTIC ENGINEERING**

*Prerequisites: Any Foundation Humanities and any Foundation Physical Science course.*

This course investigates how the sounds of spaces affects how we interact within spaces and with other people, and how the acoustic elements of spaces can be designed. The course begins with historical and contemporary examinations of the relationship between the acoustics of spaces and social interaction and organization, from the relationships of democracy and amphitheatres in ancient Greece to religious music and architecture to contemporary soundscapes of shopping. The course then turns to the physics of sound, including how sounds propagate, room acoustics and sound diffusion. The knowledge of the social history of aural architecture and acoustics is then applied to projects where students engineer the sounds of spaces, with the option to complete projects to improve the acoustics of spaces on Quest's campus.

## **IND 3141 COMPUTER SCIENCE**

This is a course in theoretical computer science that looks at some major problems in the field. We will begin with a question that is fundamental to all computer science: what is the nature of computation? The answer is that computation is equivalent to effective calculability in lambda calculus. This answer will lead us to study general recursive functions, and from there to Lisp, which is a functional programming language that grew out of lambda calculus. Lisp will provide a springboard for studying several other serious problems, possibly including: (i) whether the extensions of P and NP are equivalent (whether every problem that can be quickly verified by a computer can be quickly solved by a computer); (ii) what limitations does the Halting Problem put on effective calculable; (iii) do super-

recursive algorithms disprove the Church-Turing thesis; (iv) what are the limits of artificial intelligence to solve certain computational problems; (v) how does the quantum theory of computation address problems of computational complexity; (vi) what are the philosophical dimensions of computational complexity. Please note: this course is theoretical in focus and is not a course in programming.

### **IND 3143 THE CONSERVATION OF WIDE-RANGING MIGRATORY SPECIES**

Wide-ranging and migratory species use multiple habitats throughout the year. This can lead them particularly vulnerable to habitat change, jurisdictional challenges, as well as to uncertainties in estimating population sizes. The first part of the course will investigate the causes of imperilment and conservation strategies for migratory species. The second part of the course will focus on specific techniques to help monitor and conserve wide-ranging and migratory species. Strategies may include tagging programs, bycatch reduction techniques, and protected areas as well as international agreements, such as RAMSAR and the Convention on the Conservation of Migratory Species of Wild Animals. Readings will include texts in population ecology, biogeography, conservation biology as well as policy. This course will focus primarily on birds, mammals and fish.

### **IND 3144 ALGORITHM ANALYSIS AND DESIGN**

*Prerequisites: Computer Programming or Object-Oriented Programming or Permission of Instructor*

An algorithm is a finite procedure, governed by precise instructions, moving in discrete steps, whose execution requires no insight or intelligence. However, the process of creating such an algorithm, especially to solve complex real-life problems, requires tremendous intuition and creativity. In this course, students develop this intuition by analyzing and designing algorithms that optimize efficiency and effectiveness, and applying them to a wide variety of problems, including: sorting sets, searching graphs, matching roommates, planning courses, scheduling tournaments, and solving six-star Sudoku puzzles. In addition to programming algorithms in Java, students will explore the key ideas in computational complexity theory, including NP-completeness and the P-versus-NP problem.

### **IND 3145 COMPUTER PROGRAMMING**

This course explores the fundamental concepts and techniques used to design, implement and test computer programs. Students will use the Java programming language to explore commonly implemented algorithms and learn how to write understandable and efficient programs. Topics covered in this course will include object-oriented programming, data structures, arrays and recursion. This course is appropriate for everyone who wants to create software. No prior computing experience is required.

### **IND 3146 STATISTICS 1: THE PRACTICE OF STATISTICS**

Statistics, the most pervasive application of mathematics in modern society, is a standard research tool in such diverse fields as biology, psychology, medicine, business, and politics. Its apparent invincibility belies the ease with which it can be abused to assist corporate, political, and even scientific agendas. In addition to critiquing existing uses of statistics, students develop an ability to use them responsibly to reflect information implied in data. Specific topics include: descriptive statistics, distributions, hypothesis testing and confidence intervals, regression and correlation, and analysis of variance.

### **IND 3148 TRANSLATION AND CROSS-CULTURAL COMMUNICATION**

*Prerequisite: Completion of the language requirement, or a demonstration of competence in a language that is not English.*

What does it mean to translate? This course will examine the problems of translation from multiple perspectives. We will look at literature about translation; at discussions of the social and political implications of translation; and at the political and psychological processes behind moving/living between languages. Along the way, we'll debate word choices and governmental policies, and look forward to the meaning of machine translation.

### **IND 3150 NEGOTIATING RISK A: SOCIOLOGY OF SPORT IN WINTER HAZARDS**

*Prerequisites: There are no course prerequisites for this class. However, you must: 1) be an intermediate/advanced on piste skier, 2) possess a full set of backcountry touring equipment and know how to use it all, 3) be able to properly execute a basic transceiver search (find one beacon in three minutes), and 4) be in good shape with the ability to hike in challenging conditions for the entire day. All these requirements will be assessed once registration has taken place.*

This class focuses on the sociology of sport within the context of the winter hazards associated with ski-touring. We will examine the socio-cultural patterns, structures, inequities, and organizations that shape understandings and experiences of sport and extreme sports, not always in similar ways for all people. The class engages a long-standing and robust multidisciplinary framework stemming from cultural anthropology, sociology and psychology. The central guiding academic conversation which will integrate classroom-based learning, academic snow science literature, and backcountry skiing-related experiences is the thread of who chooses to participate in extreme sports, how we can explain those seemingly personal choices within a greater field of social forces, institutions, and representations, and how we can interrogate our own understandings and embodied experiences in the backcountry. To facilitate this exploration, roughly half the course will take place in off-piste ski environments.

*Additional Fees: Course fees will apply."*

### **IND 3151 NEGOTIATING RISK B: RISK AND RESCUE IN THE ALPINE**

*Prerequisites: Enrolment is subject to a risk management evaluation and will be assessed once registration has taken place.*

Squamish is an easy entry point to the alpine environment—either in the form of roadside climbing on the Chief, or alpine mountaineering on Sky Pilot. This course explores individual, group, and societal responses to the risks inherent in alpine recreation, particularly climbing and mountaineering. Students will acquire some conceptual tools for understanding risk as a phenomenon, and will explore how aspects of human cognition, group dynamics, and environmental stress affect decision-making under conditions of risk and uncertainty. The course will also consider the broader social, political, and legal context of risk as recreation, closing by pondering whether there ought to be a right to rescue in the wilderness. Throughout the course, classroom discussions will be interwoven with field experience in the alpine, and students will directly experience the challenges associated with evaluating risk in wilderness settings, while also acquiring the skills needed to move safely and thoughtfully through alpine environments.

*Additional Fees: TBD*

## **IND 3152 IMPACTS OF OUTDOOR RECREATION AND TOURISM**

*Prerequisites: Any Earth, Oceans and Space course and Biodiversity of British Columbia (LIF 2210).*

This course will examine different types of impacts (both positive and negative) related to outdoor recreation and tourism activities, with a particular focus on economic, social, cultural and ecological impacts. (Ecological impacts will be further subdivided into soil, water, wildlife and vegetation.) Students will obtain an understanding of how to identify and monitor impacts, mitigate negative impacts and maximize positive benefits associated with recreation and tourism. We will explore how these impacts may be reviewed and measured through readings, lectures, assignments, field trips and substantial field work. Squamish provides an ideal 'living library' in which to explore this complex and multi-faceted subject. Impact identification, monitoring, and mitigation are critical skills for developing and maintaining a sustainable recreation and/or tourism industry. Through extensive fieldwork, students will develop field skills within the physical, ecological and social sciences.

## **IND 3156 INTRODUCTION TO COMPUTER PROGRAMMING**

*Prerequisite: Any Physical Science course*

Working at the command line in a POSIX environment, the student will learn the Fortran and C languages and compilers, the Java compiler and virtual machine, the Python and Matlab/Octave scripting languages, and optionally Scheme and assembly. Writing every algorithm in at least four languages, a variety of methods will be applied to the overarching theme of computing the value of pi. The measurement of processor and memory loadings will be used to improve technique and to understand precision and built-in functions such as exponentiation. The differences among the ultimate sets of binary instructions due to differing operating systems, syntax, compilers, linkers, and optimization levels will also be explored. Methods include numerical integration, Monte Carlo, rejection sampling, and linear least-squares fitting; problems include pi-dependent definite integrals and Buffon's Needle.

## **IND 3157 DATA ANALYSES USING R**

*Prerequisite: Statistics 1, AP Statistics, or Instructor's Permission*

Data are crucial to most scientific research across a wide range of disciplines. This course aims to provide students with the necessary statistical tools and skills to analyze a wide variety of data types using R (statistical analyses) and GitHub (version control and collaboration). We start with the fundamentals of statistics and learn to use R. More advanced topics on how to analyze e.g. count data or binary data using generalized linear models will be done in 'project form'; start with defining a question, design a study, collect and analyze data and present the results. Special attention will be given to data visualization, as this is the start of data analysis and the end point (figure in a paper or presentation). Over the past decades, data sets have become increasingly large and readily available over the Internet. We will explore how to tackle 'big data' questions. At the end of the course the students will be proficient at using R, have learnt how to design, execute and present a research project and most importantly, know how to approach solving new statistical problems in the future. For well-prepared students, review material in the first week of the course will be replaced by advanced material on a case-by-case basis to ensure that all students are challenged throughout the course.

## **IND 3158 DATA SCIENCE: TIME SERIES AND MULTIVARIATE STATISTICS**

*Prerequisite: Statistics 1, AP Statistics, or Instructor's Permission*

In Data Science B, students learn to analyze and draw conclusions from data. The major foci of the course are time series analysis and examination of multivariate data sets. Time series decomposition is discussed in detail, and forecasting is introduced. Multivariate data are analyzed using regression, multiple tools to compare populations, and principal component analysis. Students are also required to learn additional techniques specific to their interests. Students also gain experience judging the suitability of the data analysis of others. For well-prepared students, review material in the first week of the course will be replaced by advanced material on a case-by-case basis to ensure that all students are challenged throughout the course.

## **IND 3161 POLITICS OF RISK AND RESCUE**

Squamish is an easy entry point to the alpine environment—either in the form of roadside climbing on the Chief, or alpine mountaineering on Sky Pilot. This course explores individual, group, and societal responses to the risks inherent in alpine recreation, particularly climbing and mountaineering. Students will acquire some conceptual tools for understanding risk as a phenomenon, and will explore how aspects of human cognition, group dynamics, and environmental stress affect decision-making under conditions of risk or uncertainty. The course will also consider the broader socio-political context of risk as recreation, closing by pondering whether there ought to be a right to rescue in the wilderness. Throughout the course, classroom discussions will be interwoven with field experience in the alpine, and students will directly experience the challenges associated with evaluating risk in wilderness settings, while also acquiring the skills and understandings to move safely and thoughtfully through alpine environments.

## **IND 3163 DECOLONIZE: RESEARCH AND PRACTICE**

This course explores the nuanced scholarship of decolonial studies, examining the problems it poses, the problems it faces in implementing, its proposed methods, theory, and the practices of doing decolonial research while writing in colonial language or studying in a settler state. How did the colonizing agenda shape and manifest in labour, education and cultural policies? How did it affect the colonized, and how did the latter engage with it? What are some of its legacies today in research? This seminar also seeks to theorize colonialism as a global experience, comparing different contexts and issues for research in the Global North as well as South.

## **IND 3164 ARTIFICIAL INTELLIGENCE**

*Prerequisite: Any Concentration Math course or Tutor permission.*

Artificial Intelligence (AI) is the foundation for nearly every 21st century technological breakthrough. From self-driving cars to automated translation apps, AI is transforming every aspect of our society, with numerous applications to health care, education, finance, transportation and environmental sustainability. In this course, we uncover the mathematics of "automated reasoning" that enable us to understand the core topics of AI, which include search, constraint satisfaction, game playing, machine learning, knowledge representation and reasoning, planning, robotics, and natural language processing. We will achieve this through challenging problem sets, in-class presentations on AI topics and applications, and performing a close reading of the papers that will be presented at AAAI 2018, the world's largest and most prestigious Artificial Intelligence conference. The last week of this conference will take place in New Orleans, where students will attend AAAI 2018, and interact with the researchers and companies whose technologies will shape our century.



## **IND 3165 INTRODUCTION TO ROBOTICS**

In this course, we'll dive into the exciting world of robotics using LEGO hardware and software. Students will work in pairs to design, program, and refine robots to solve a series of progressively more complex challenges, ranging from sorting items to rudimentary autonomous vehicles. We will also discuss social and ethical concerns of the use of robotics in our world; who, for example, is responsible if an autonomous automobile causes damage or injury?

Students are not expected to have any background with robotics, programming or LEGO.

## **IND 3166 ERGONOMICS: DESIGNING HEALTHY AND PRODUCTIVE WORKPLACES**

*Prerequisites: Algebra, Graph, Measurement and Numbers Qskills.*

What characterizes a "healthy workplace"? How can we design work such that it is both productive and satisfying to workers? This course will examine the influence of work design on the physical, cognitive, and psychosocial health of workers. Ergonomics (or human factors) is the scientific discipline concerned with understanding the interactions among humans and other elements of a work system, such as equipment, tools, the workspace and work organization. Lack of consideration of the strengths and limitations of people in the design of work can lead to worker ill-health (injuries, stress), production problems (human error, low productivity or quality) and societal issues (low competitiveness, poorer economy). A field trip to a local industry is included. Students in small groups will be assigned to investigate a worksite at Quest to conduct their final ergonomic projects. They will evaluate the physical, cognitive and psychosocial aspects of the work, and make recommendations for improvement.

## **IND 3167 LIVING IN THE CRYOSPHERE**

Extreme cold environments require special adaptations for life to survive. In this course, we take core principles of the physical sciences to understand how and where snow forms and why it varies across regions. We combine this knowledge with theory from the life sciences to understand how life adapts and why some animals migrate while others stay put. This course combines theoretical principles with practical work in the lab and field excursions. Students must expect to be challenged with problems that require interdisciplinary thinking to be solved.

## **IND 3168 MULTIMODAL COMMUNICATION**

Everyone uses some form of communication and we tend to think of this in terms of spoken, written or signed language. But humans do much more to communicate—we gesture, we use posture, we establish or break eye contact, we design documents with specific colours, etc. In this course, we will broadly examine the exciting phenomenon of multimodal communication, drawing from psychological, sociological and linguistic approaches. How does gaze affect arguments? How do we signal our identities with words? What does gesture have to do with spoken language? How do we study this extremely complicated subject? Students will complete a final research project in which they will practice using analytical methodologies discussed in class.

## **IND 3201 HUMAN RESPONSES TO CLIMATE CHANGE**

Despite a wealth of observations and a scientific consensus regarding the anthropogenic influences on earth's climate system, we have yet to develop any meaningful national or international policies about what (if anything) should be done about climate change. Why is this? In this course, we will look at the "super-wicked" challenge of climate change

from a number of different perspectives: including as a scientific, behavioural, technological, economic, development and political phenomenon. We will explore the major human responses to climate change: mitigation (i.e., lowering GHG emissions); adaptation (i.e., adjusting to impacts); and also, obfuscation (i.e., debating the scientific consensus and distracting the argument). Students will have the opportunity to explore specific aspects of this topic in detail in projects and interact with international experts on field trips.

## **IND 3202 ENVIRONMENTAL AND ECOLOGICAL ECONOMICS**

*Prerequisites: Political Economy and Biodiversity of BC or Foundation Ecology.*

One of the biggest challenges facing the world today is that of living within the limits of our environment. Natural resources are becoming scarcer, and human activity is changing our environment and planet. This course examines perspectives from economics on these and related issues, concentrating on both conventional economic analyses of issues, such as pollution and optimal resource use (for which established techniques of microeconomics can be adapted) and newer, heterodox approaches that have come to be known as ecological economics.

## **IND 3206 LAND USE, CLIMATE CHANGE, AND WILDLIFE**

*Prerequisite: Biodiversity of British Columbia.*

Land use is considered the major threat to species in the immediate future; however, climate change is also having short- and long-term impacts on species. Both factors can interact to increase overall impacts to species, communities and ecosystems. At the same time, there is uncertainty in what changes will occur under climate change, and how to mitigate those changes. Despite uncertainty, decisions must be made. This course is primarily case-study based. Students will be required to act as terrestrial ecologists working under a variety of stakeholder umbrellas (government, industry, consulting, academia, NGO, First Nations), which means understanding the key issues, limitations, and responsibilities encountered in each position. They will engage in a decision-making process within a multi-stakeholder team to resolve a topical wildlife issue resulting from climate change and land-use impacts.

## **IND 3208 SUSTAINABILITY**

This course explores methods and tools for communities to explore different development options and think about how to develop sustainability. The course in particular focuses on the use of interactive visualization for community planning, and it explores the development and application of these tools from theory to practice. Students will learn theories related to sustainability, systems thinking and sense of place, and will apply this knowledge to exercises in systems modelling, scenario development and visualization. Course activities will involve the use of a variety of software, including SketchUp, Google Earth, Adobe Photoshop, ArcGIS and Unity3D; however, no previous experience in these programs is required. Theories, concepts and methods taught in the course relate to a research project currently being conducted on the use of visualization for community planning, and time permitting, students may have the opportunity to be involved in and contribute to this project.

## **IND 3209 THE USEFUL AND TROUBLING INTERSECTIONS OF LAW AND SCIENCE**

This interdisciplinary course will investigate how science influences law and law influences science in the laboratory, courtroom and society at large in the 21st century. Scientists rely on the scientific method, on isolating and testing one hypothesis at a time, and concluding certainty only within an accepted range of doubt (conventionally 5%). Absolute certainty is rare. In contrast, lawyers often require absolute certainty—or at least a binary “yes/no” answer—on the witness stand to meet the legally accepted standards for burdens of proof. The two disciplines of science and law undoubtedly need each other. Lawyers rely on expert witnesses to interpret technical matters and scientists need lawyers to protect their rights to pursue and publish their research. But do the two disciplines also work at cross-purposes? Can science be used to obstruct justice? Can the law damage the integrity of scientific data? This course will examine these questions using a combination of classroom discussions, group role-playing, and independent research.

## **IND 3210 FARMERS AND FISHERS**

*Pre-requisites: Number, Graphs, Algebra & Measurement Qskills and any Foundation Humanities, Life Science, Mathematics, Physical Science or Social Science course.*

What are the social and ecological impacts of food production and what are potential strategies to mitigate these impacts? This interdisciplinary class will explore the physical and biological characteristics of agricultural and marine systems and identify the key psychological, cultural and ethical challenge that will help to create more sustainable food systems. Most of us know very little about the life history of the food we eat and the people who produce our foods. This is partly because of the globalization of the food systems that increases the distance between consumers and producers. In North America, there is also a cultural change that places less emphasis on food. The focus of this course is not on food security, nor on access to high quality food in cities and the broader socio-political food system, but rather focuses only on the lives of farmers and fishers, and the ecosystems with which they interact.

There is a \$150 course fee to cover travel expenses for an extended, off-campus, field trip ('Front-Country' camping in a yard or farm).







# LIFE SCIENCES

Students choose three of four Life Science courses that encompass the study of life, ground students in the place where they are learning, and fit this local environment into a broader evolutionary context.

## LIFE SCIENCE FOUNDATIONS

### LIF 2110 EVOLUTION

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands*

How does evolution happen and how do we know? What and how can we learn about events that happened millions of years ago? How is evolution relevant to climate change, disease transfer, and antibiotic resistance? Students will answer these questions and many others by studying the major lines of evidence for evolution, including the fossil record, natural selection, DNA replication and cell division, gene expression, mutation, heredity, and the formation of new species. Emphasis will be split between learning core concepts and applying those concepts to real-world examples. Students will practice the scientific method, write and communicate science, read and critique scientific literature, and conduct laboratory studies.

### LIF 2210 BIODIVERSITY OF BRITISH COLUMBIA

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands*

The natural world is a complex and captivating place. From the ocean to the alpine, the forest to the field, this course will introduce students to the organisms and ecosystems that surround us. While accessing the wide variety of habitats found near Squamish, we will explore the causes and consequences of biological diversity, by documenting patterns in the field and linking them to underlying processes. We will immerse ourselves in the empirical and theoretical science that strives to make sense of this ecological complexity. Students are challenged to collect and analyze data, and to engage their curiosity and creativity to test hypotheses about natural phenomena across organismal, population, community, and ecosystem scales. We will practice the scientific method, write and communicate science, read and critique scientific literature and conduct field studies.

### LIF 2310 WHAT IS LIFE?

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands*

Biology is the study of life, but what is life? What are its origins? How does life persist and perpetuate itself, and what is the future of life? These deceptively simple questions underpin the Life Sciences and provide us with an opportunity to investigate both historic milestones and cutting-edge innovations across all scales of inquiry, from molecules to biomes. To examine how living things work, we will consider the key processes of birth, metabolism, reproduction and death, and the physiological and behavioural mechanisms by which they are achieved. Students will practice the scientific method, write and communicate science, read and critique scientific literature, and conduct field and laboratory studies.

### LIF 2410 SCIENCE OF HEALTH AND WELLNESS

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands*

How do you know that you're healthy? How do you respond when you are told to try the latest health claim? Do you jump in or do you evaluate the science behind it? This class introduces students to the art of critically evaluating scientific evidence in a world inundated with information and opinions. Today more than ever we consult Dr. Google, but what does the science tell us? How can we use science to inform life long decision making about our health and wellness? In this course, students: 1) discuss perceptions of health and wellness across individuals, communities, and populations, 2) recognize and evaluate health claims, and 3) design and participate in the research process. Along the way, students practice mindfulness and self-care, and will have multiple opportunities to develop skills for staying grounded in challenging situations. This course is evidence based, timely, and allows students to develop strategies that will benefit their university education and subsequent life.

## LIFE SCIENCE CONCENTRATIONS

### LIF 3002 MARINE BIODIVERSITY

Prerequisite: Biodiversity of BC or Tutor permission

Additional fees may apply

Patterns of biodiversity vary across large latitudinal, elevational, and area gradients, with regional and local patterns driven by microhabitat variation and interspecific interactions. How do light, temperature, and circulation establish these large-scale patterns? How they interact with competition, predation, and parasitism in establishing local patterns? What are the consequences of biodiversity for ecosystem productivity and resilience in the face of disturbance, invasion and climate change? In this course we test the predominantly terrestrial theories of biodiversity in the marine environment, where the phyletic diversity is oddly higher, but the species-level diversity is oddly lower.

This course includes a week-long field trip to a marine research station to quantify local diversity and test theoretical hypotheses. Students should be prepared for physical exertion under variable weather conditions. Marine Biodiversity complements Marine Ecology (population and community dynamics), Marine Zoology (animal adaptations to the sea), and Coastal Field Ecology (cross-boundary coastal ecosystem subsidies).

### LIF 3005 COASTAL FIELD ECOLOGY

Prerequisite: What is Life? or Biodiversity of British Columbia or Tutor permission

Additional fees may apply

Coastal environments are characterized by stark physical boundaries between land and sea. In this advanced ecology course, students will examine recent scientific literature exploring the tremendous degree to which energy and biomass move across these boundaries, with consequences for ecosystem function, and implications for ecosystem services and conservation planning. This course develops skills in formulating hypotheses, collecting and analyzing data, and synthesizing empirical observations with the primary literature.

This course includes a week-long backpacking trip along the Juan de Fuca Trail on the outer coast of Vancouver Island, where we develop skills in planning and conducting field expeditions. Students should be comfortable with wilderness camping and be prepared for substantial physical and mental exertion in challenging terrain under variable weather conditions: a pre-course selection process may be applied to maximize individual and group safety for this course.

Coastal Field Ecology complements Marine Zoology (animal adaptations to the sea), Marine Biodiversity (causes and consequences of diversity patterns in the world's oceans), and Marine Ecology (population and community dynamics).

### LIF 3006 TOPICS IN SUSTAINABILITY

Prerequisite: Foundation Ecology or Biodiversity of BC.

Humans are the only species on earth with the capacity to use up the finite resources of the planet, and to be aware of it. What choices are we making in our use of water, air and soil? Of animals, plants and minerals? What does it mean to live sustainably? When is it worth it to live beyond our ecological means? Will technology or simplicity provide more solutions? In Topics in Sustainability, we examine a specific question concerning the sustainability of human life on earth from the perspective of ecology. Focal topics include permaculture (re-examining

its scientific foundations, a half-century later), poo (an essential ecosystem resource, and something of a management challenge), and harvesting and hunting (considering how invasion and predation—by humans and other species—affect ecosystem function in coastal systems). Field trip costs will be incurred.

### LIF 3007 QUANTITATIVE RESEARCH METHODS FOR LIFE SCIENCES

Recommended: The Practice of Statistics.

The pursuit of knowledge across the sciences requires key skills in research methods and presentation. In this course, students will develop these skills by critically reading and analyzing scientific literature, proposing interesting research questions and hypotheses, transforming these into appropriate and rigorous surveys and experiments, and collecting (or simulating), visualizing and analyzing pilot data. These skills are applied to writing and presenting and critiquing research proposals in standard professional scientific format. From this course, students learn the basic survival skills necessary to be an introductory researcher in their chosen fields. The skills developed in this course can be applied to quantitative research in any discipline, but the focal case studies and methods will be based in the life sciences.

Recommended prerequisite: Statistics 1

### LIF 3009 BEHAVIOURAL ECOLOGY

Prerequisite: Biodiversity of BC And Evolution or tutor permission.

Why do fish school, or elk herd? Why do meerkats cooperate by posting sentries to warn other meerkats of danger, and is human cooperation any different? Behavioural ecology seeks to understand how animal behaviour evolves in the natural world. This field links the study of behaviour with the ecological stage it plays out on and evolutionary forces influencing it. During this course, we will discuss topics such as: the economics of resource exploitation, interactions between predator and prey, competition and cooperation, sociality, sexual selection, parental care and communication. We will apply ecological models and game theory to explain the evolutionary development of behavioural adaptations and test these predictions using computer simulations and experimental data. We will also address special topics in animal behaviour such as the evolution of cognition, intelligence and consciousness. Students interested in ecology, conservation biology and evolution—or that simply want to understand life better—should consider this course.

### LIF 3010 PLANT BIODIVERSITY

Prerequisite: Biodiversity of BC or tutor permission.

Plant Biodiversity addresses our understanding of the causes and consequences of botanical diversity. An initial review of basic plant biology underpins questions such as: What determines plant biodiversity at local, regional and global scales? How are plants adapted to cope with environmental stressors? Are diverse plant communities more resilient to climate change than species-poor communities? What are the consequences of changes in plant biodiversity for the functioning of ecosystems? Students emerge with a foundation in plant biology, taxonomy and floristics across many of British Columbia's ecosystems. This course relies heavily on field and lab studies, including a multi-day off-campus excursion.

## LIF 3011 QUEST FOR ANTARCTICA

Antarctica is the most extreme and isolated continent on Earth. It is also a hotbed for scientific discovery and biodiversity, a model for global geopolitical cooperation, a beacon for intrepid explorers, and an important regulator of global climate. Quest students will experience this environment first-hand and, using a multidisciplinary approach, be immersed in the lore, science and politics of this vast and important continent. Our platform for 21 days is the ice-strengthened R/V Akademik Sergey Vavilov, upon which students will cross the Southern Ocean from Port Stanley in the Falkland Islands to the western Antarctic Peninsula and Weddell Sea regions. Once in Antarctic waters, we will study the local environment via ship, shore and Zodiac excursions. This is a rare opportunity to experience a world so far removed from our own, it is like a different planet.

Note: Additional Fees Apply - Amount TBA

## LIF 3012 ISLAND BIOGEOGRAPHY

*Prerequisite: Biodiversity of BC.*

*Recommended: Statistics 1.*

The Theory of Island Biogeography was one of the most influential biological ideas of the 20th century. At the interface between community ecology and evolution, island biogeography was originally conceived to explain the number of species found on oceanic islands but has since been used to estimate how many species should be present on any fragmented landscape and has been applied to everything from biological reserve design to forestry practices. Students will read the original book by Robert MacArthur and E. O. Wilson that spawned a whole field and will explore the application of this theory to current-day conservation problems on islands and mainland alike.

## LIF 3013 MARINE ZOOLOGY

*Prerequisite: What is Life? or Biodiversity of British Columbia or tutor permission*

*Additional fees may apply*

Life arose in the ocean, and almost every one of the ~32 known animal phyla live there today. Yes, the liquid sea is a foreign environment: its homogeneously dark and cold depths are punctuated by blistering sulfuric vents, while nearshore habitats experience rapid and extreme fluctuations in temperature, salinity, pH, nutrients and toxins. How have organisms adapted to this seemingly alien and hostile environment? What unique structural and physiological solutions have emerged to the challenges of locomotion, foraging and reproduction? How have certain terrestrial organisms managed a return to the sea? To study these extraordinary animals, we will integrate across the zoological sciences to explore anatomy, physiology, biomechanics, behaviour, evolution, ecology and conservation.

This course includes a week-long field trip to a marine research station to hone natural history and quantitative skills in studying animals up close in their natural environment and in the lab. Students should be prepared for physical exertion under variable weather conditions. Marine Zoology complements Marine Ecology (population and community dynamics), Marine Biodiversity (causes and consequences of diversity patterns in the world's oceans), and Coastal Field Ecology (cross-boundary coastal ecosystem subsidies).

## LIF 3014 INTRODUCTION TO ETHNOBOTANY

*Prerequisite: Biodiversity of BC*

Indigenous Peoples around the world have built and maintained cultural relationships with plants for millennia. Ethnobotany is more than simply the study of plant use; it is the study of the interrelationships between people and plants. In this course, students will learn about plants as foods and medicines and will explore the cultural and the spiritual significance of ethnobotanical knowledge in different Indigenous cultures. Students will experience a combination of classroom activities, guest speakers and field trips; and together, we will draw on local knowledge and global topics of interest. Major themes will include the roots of ethnobotany as a discipline (both academically and culturally), local Squamish Nation ethnobotanical knowledge, ethnobotanical case studies from other First Nations across British Columbia, ethnobotanical restoration and cultural knowledge renewal.

## LIF 3016 AVIAN BIOLOGY

*Prerequisites: Biodiversity in B.C., Foundation Ecology or tutor permission*

Found on every continent and in every habitat, birds are among the most familiar animals in our day to day lives, yet they are also among the most remarkable; their incredible migrations, complex breeding strategies and amazing adaptations are fascinating in their own right, and also offer limitless possibilities to study broader questions in ecology. This course will introduce students to the theory and practice of avian biology with an emphasis on field-based research. Topics will include bird diversity, distribution, ecology, mate choice and migration, as well as practical techniques used to study birds in the field. Classwork will combine seminars with discussions of published research in avian research and work with museum collections. Frequent excursions into the various habitats around Squamish and a self-directed field study will familiarize students with the identification, behaviour and ecology of birds. Students will need a pair of binoculars. Expect extra costs associated with field and museum excursions.

## LIF 3017 INTRODUCTION TO ETHNOECOLOGY

Ethnoecology is the study of how Indigenous Peoples interact with the ecosystems in which they live. These interactions include the ways in which different ecosystems are utilized and managed, as well as the cultural perceptions, knowledge and spirituality that inform these practices. In this course, we will explore the discipline of ethnoecology through a combination of lectures, guest speakers, field trips and films. Major themes will include sacred connections to place, managed ecosystems, the interplay between science and traditional knowledge and how sacred ecology informs Indigenous land and resource management. We will draw on examples from local and international Indigenous peoples.

## LIF 3019 PRIMATOLOGY: BEHAVIOUR, ECOLOGY, AND EVOLUTION

*Prerequisite: Foundation Evolution.*

Primatology is the scientific study of our closest living relatives and the intricate interaction between environment, behaviour, and evolution in shaping the primate order. Through an ecological lens, this course investigates the environmental link to primate behavioural patterns, foraging habits, mating preferences, social relationships and cognition. What factors differentiate lemurs, monkeys and apes? Why did some species abandon the trees? What gives rise to female dominance? What are the chimpanzee and bonobo perspectives on love and war? Students will also be challenged to critically examine past and present field methods for studying primates in the wild, the value of primates in human-impacted ecosystems, and the current conservation status of primates worldwide.

## LIF 3020 CONSERVATION OF AMPHIBIANS & REPTILES

*Prerequisite: Biodiversity of BC.*

The study of amphibians and reptiles is called herpetology, from the Greek word "herpes" meaning "creeping thing." This name aptly reflects that amphibians were the first vertebrates to "creep" out of the water onto land, a highly significant evolutionary step. Over the past 350 million years, amphibians have evolved a remarkable diversity of adaptations to life on land, but currently one third of the 7,000 amphibian species worldwide are threatened with extinction. This course will explore why amphibians are at risk and the conservation efforts underway to recover them. Field exercises will focus on developing the skills to inventory species, identify important habitats and improve our understanding of amphibian behaviour and ecology. We expect the course will contribute valuable information and educational material to aid in the conservation of local species. The course may include a multi-day field trip.

## LIF 3022 THE HIVE AND THE HONEYBEE

*Additional Course Fee: \$100 CDN*

This course starts with the art of beekeeping. By engaging with this age-old practice, we will gain an intimate insight into the honeybee and her habits. While she may at first appear to be just a typical invertebrate, our investigations will reveal her as a complex organism with sophisticated biology, behaviour and social interactions; with other bees, with nature and with humans. Honeybees are one of the most successful and broadly introduced species in the world; yet they are facing devastating declines, with potentially catastrophic implications for humanity and our food systems. Honeybees can teach us a great deal about decision-making, communication, crisis and survival. By wrestling with the problems of the hive, perhaps we can catch a glimpse of the answers to some of life's other pressing questions.

## LIF 3023 MARINE ECOLOGY

*Prerequisites: Biodiversity of British Columbia (LIF 2210) and Evolution (LIF 2110); all Foundation Life Science are recommended.*

Marine ecosystems cover some 70% of the Earth's surface (and more of its biosphere volume) and have curiously different environments and ecologies from the ones we are familiar with on land. We will engage with some of the major debates and emerging concepts about the dynamics of marine ecology. At the population scale, we will ask how reproduction differs, and why Allee effects and metapopulations are so common in the sea. At the community scale, we will ask why food webs are larger and more complex, why there is negligible pollination or vector-borne disease transmission, how competition and mutualism operate between plants and animals, and how chemosynthetic communities compare to photosynthetic ones. We will compare the relative importance of top-down vs. bottom-up factors regulating marine communities and examine how individual species affect the carbon and nitrogen cycles. Along the way, we will take virtual trips to polar, temperate and tropical ecosystems to assess their similarities and differences.

## LIF 3024 BIOLOGICAL INVASIONS

*Prerequisites: Biodiversity of British Columbia (LIF 2210) and Evolution (LIF 2110); all Foundation Life Science are recommended.*

Biological invasions are one of the major agents of anthropogenic global change, affecting ecosystem function, goods and services in all habitats around the world. They also manifest ecology and evolution on steroids: although most potential invasions fail, the successful ones can be dramatic, with faster and more intense interactions than we typically see in a native ecosystem. To explore this phenomenon, we will ask four key questions: What are the causes of invasions? What

makes some species better invaders? What makes some communities more invadable? And, why do most invasions fail...but some are so high impact? In pursuing these questions, we will critically examine the evidence for current hypotheses in invasion biology, such as biotic resistance, invasional meltdown, enemy release, and homogenization. Finally, we will consider the vexing problems of how to prevent and control invasions, logistics of re-introductions, and ethics of assisted migration.

## LIF 3025 BIOLOGY OF COASTAL PATAGONIA

*Prerequisites: Biodiversity of British Columbia (LIF 2210)*

*Recommended: Coastal Field Ecology, Marine Zoology, Marine Ecology, Biological Invasions, or similar Concentration course(s). Some knowledge of Spanish is beneficial, but not required.*

The coastal biology of the Northeast Pacific and the Southwest Atlantic offer a striking contrast in comparative biogeography. We will explore the ecosystems and organisms of the Patagonian coast of Argentina to address complex ecological questions. How does the southbound Brazil current compare to our northbound Alaska current? How do the dry steppe-like coastal plains compare to our coastal rainforest? What are the major ecosystem and community dynamics, and how do the keystone, dominant, invasive and threatened species compare? What are north-Pacific seaweeds and barnacles doing on the Argentine coast, and what is the South-American nutria doing in Canadian wetlands? How do penguin and rhea colonies compare to those of murres and cormorants? How do southern right whales' migrations compare to those of grays and humpbacks? How does predation by orcas differ in these two locations? We will be based primarily at the Centro Nacional Patagónico (CENPAT, <http://www.cenpat-conicet.gob.ar/>) in Puerto Madryn, with field work on the surrounding coast including the Punta Tombo penguin refuge and the Península Valdés. Included in the course schedule will be the 10th Annual Conference on Marine Bioinvasions (October 2018). Students will serve as conference volunteers to reduce registration costs, and conference sessions will be built into the coursework. Students should be prepared for the mental and physical challenges of living, travelling and conducting fieldwork in what may be an unfamiliar climate, country, culture and language. Students are responsible for ensuring they have a valid passport and can meet any visa and medical requirements. Schedule permitting, students may be able to travel independently before or after the Block. Pre-course meetings, deposit and medical information will be required to confirm course registration; final acceptance is at the tutor's discretion, based on risk management considerations.

Additional Fees: Airfare + fees tbd

## LIF 3026 SPATIAL ECOLOGY

Concepts in Spatial Ecology rely heavily on quantitative thinking. Biodiversity of British Columbia and one concentration level course with a quantitative focus are required for this course. Examples of suitable concentration level courses are: Stats 1, Quantitative Research Methods, or Quantitative Methods in the Social Sciences. Others may be accepted upon discussion with the instructor. Alternatively, permission may be granted from the instructor upon demonstration of a student's quantitative abilities.

Spatial ecology encompasses the fields of landscape, population and community ecology, as well as biogeography, and seeks to understand the relationships between ecological processes and patterns across space. In this course, we will explore how and why space matters in an ecological context. Students will engage with concepts of scale, spatial autocorrelation, pattern and process as they relate to metapopulation dynamics, dispersal, competition and predation. New understanding of these topics will allow for discussions on disease spread, habitat loss and fragmentation, and climate change. Students will conduct a spatial statistical analysis, in R and/or GIS (geographic information systems), to answer a question in spatial ecology.

## **LIF 3028 WILDLIFE RESPONSE TO CLIMATE CHANGE**

*Prerequisites: Biodiversity of BC*

Ecologists have been detecting wildlife responses to climate change for some time and the evidence is mounting. Species distribution change has been detected across the globe in an increasingly large suite of taxa. The timing of biological events, such as migration and reproduction, is also shifting and food supply is out of sync with demand. All this change is leading to establishment of novel communities: groups of species that have not previously been in contact. Such change and perturbation allow us to better understand our natural systems, making it an exciting time to study ecology! Students will examine these topics by linking ecological theory at the species, population, community and macro level with published research at the forefront of this rapidly evolving field. By the end of the course, students will be well prepared to engage in discussions (or action) on the future of wildlife management and conservation under climate change.

## **LIF 3029 INTRODUCTION TO PARASITOLOGY**

Though small, parasites are fantastically complex organisms. From the single-celled protozoan to the acrobatic flea, parasites have evolved numerous ways to infect their hosts. In this course, we will cover the taxonomic and morphological diversity of parasites through evaluation of laboratory specimens. In addition, we will discuss the amazing ways in which parasites survive harsh environments, adapt to different host species, manipulate and evade the host's immune system, and influence host evolution. Using this knowledge, students will explore the ways in which parasitic infections can be controlled and will brainstorm future research needs. Students will also study the historical and current impacts of parasitic diseases, as well as discuss how this burden of illness may be influenced by rapid urbanization and climate change.

## **LIF 3030 WILDLIFE POPULATION MANAGEMENT**

Wildlife managers use the best available science to sustain wildlife populations and their habitat while allowing for consumptive use, as appropriate. A key role of the wildlife manager is to determine population size and set appropriate harvest quotas, to monitor and investigate changes in population size, and to apply conservation actions as needed. We will engage deeply with population ecology theory to understand how medium to large mammals and game species are managed and conserved. From this science-based perspective, we will discuss current hot topics in wildlife management.

## **LIF 3031 TROPICAL BIODIVERSITY IN PERU**

*Prerequisite: Biodiversity of British Columbia.*

Biodiversity varies hugely across the planet, with extreme high diversity in the tropics. However, science lacks a fundamental understanding of why it varies so much. This course provides students with a first-hand experience of tropical biodiversity, from the Peruvian Andes deep down into the Amazonian lowlands. Students will experience the challenges of studying very complex tropical ecosystems and how to tackle these through discussions of core ecological and evolutionary principles and applying these to real world situations. Besides experiences and studying of diversity, we will encounter different threats to it and try to find solutions to stop this. This course takes place in Peru and students should expect challenging, but very unique environments to work in and basic living quarters at times.

## **LIF 3102 TECHNIQUES IN CELLULAR AND MOLECULAR BIOLOGY I: BASIC LABORATORY METHODS**

*Prerequisites: Foundation Evolution and What is Life?*

*Recommended: A course in cellular or molecular biology*

A true understanding of data from a given discipline requires a deep understanding of the tools used in that particular field. This laboratory course serves as an introduction to the experimental approaches used in cellular and molecular biological research. As an introductory course, the emphasis is placed on the development of basic laboratory skills through a number of experiments involving DNA isolation, basic bioinformatics, DNA and protein gel electrophoresis, basic prokaryotic cell culture and manipulation, gene cloning and the polymerase chain reaction. As this is a practical course, it is assumed that students are already familiar with basic cell and molecular biology from previous courses.

## **LIF 3103 TECHNIQUES IN CELLULAR AND MOLECULAR BIOLOGY II: ADVANCED LABORATORY METHODS**

*Prerequisites: Techniques in Cellular and Molecular Biology 1*

This laboratory course focuses on more sophisticated molecular methods, including various gene cloning techniques, cDNA library production, the construction of novel plasmid vectors, advanced bioinformatics, constitutive and inducible protein expression systems, and proteomic analyses using immunoprecipitation, and western blotting. This course focuses primarily on Block-long projects that are both assigned and designed by students in small research groups.

## **LIF 3104 CELLULAR AND MOLECULAR BIOLOGY**

*Prerequisite: Foundation Evolution*

This course serves as an introduction to cellular and molecular biology, emphasizing the central dogma of gene expression. Topics of coverage include basic cell structure, macromolecules, transcription, translation, cell signaling, genomics, proteomics, bioinformatics, as well as several techniques central to the field. This course will include a laboratory component.

## **LIF 3105 DEVELOPMENTAL BIOLOGY**

*Prerequisite: What is Life?*

*Recommended: A course in cellular or molecular biology.*

The proper functioning of an organism is critically dependent on its initial development. This course focuses on the basic developmental principles common to all animals, including pattern formation during embryogenesis, cell fate specification, cell migration and organogenesis. The emphasis will be placed on the cellular, molecular, genetic and morphological aspects of animal development using a variety of model organisms. This course may include a laboratory component.

## **LIF 3106 THE ERA OF GENOMIC MEDICINE**

*Prerequisites: Foundation Evolution AND Foundation What is Life?*

This course is recommended for students with an interest in genetics and medicine. It endeavours to give a rigorous scientific background of the latest techniques coming out of the genomic revolution for the treatment of diseases, primarily inherited disorders and cancer. The course will build on a basic knowledge of the human genome project and molecular genetics to explore the latest techniques in deciphering the human genome and how these techniques are being exploited to ostensibly generate improved therapies for disease. Topics covered will



include gene therapy, small molecule therapy, antibody therapy, and a critical review of the increased emphasis on individualized medicine. The course will not just focus on the scientific nitty-gritty of these topics, but also on the historical context and the myriad of ethical issues and challenges to policy development that these therapies invoke. Emphasis will be placed on discussing the challenges of informed consent, incidental findings and privacy because of the push for genetic information and open access. This course will include a laboratory component.

### **LIF 3107 SYNTHETIC BIOLOGY**

*Prerequisites: Evolution and What is Life?*

Synthetic biology involves the design and/or modification of biological systems to solve technological problems. This field has grown dramatically in recent years and has been applied to many problems of prime importance to human society, such as renewable energy production, design and production of therapeutic agents, detection of environmental contaminants, bioremediation, and the design and fabrication of new materials. The rapid growth in this area has been spurred by increased availability and decreased cost of genetic engineering tools. This course will focus on the methodology of synthetic biology, including the redesign of genomes and proteins, metabolic engineering and cell programming. We will also explore the applications of synthetic biology in the biotechnology, pharmaceutical and chemical industries. We will address the ethical implications of this custom design of living organisms and will consider the promise and perils of DIYBio, a movement in which a growing community of amateur hobbyists is carrying out sophisticated genetic modifications in home laboratories.

### **LIF 3108 PLANT DEVELOPMENT AND BIOTECHNOLOGY**

*Prerequisites: Two of the three Foundation Life-Science courses.*

This course will equip students with an understanding of plant development and genetics along with classical and current experimental techniques to allow them to ask topical questions surrounding the safety and utility of genetically modified organisms. The course will be divided into two units, plant development and plant genetics & biotechnology, with a concurrent Block-long student-directed research project on a specific application of genetically modified plants.

This course will undertake a rigorous study of the scientific literature to inform key ethical questions surrounding the use of plant biotechnology. As such, this course will lend itself naturally to an interdisciplinary approach and demand students to challenge themselves to consider varying and polarizing opinions under the dispassionate lens of scientific evidence. This course will thus illustrate how literacy in science can equip individuals to better ask and answer questions about their values and their planet.

### **LIF 3111 ECOLOGICAL GENOMICS**

*Prerequisites: Biodiversity or BC and Evolution, or tutor permission*

How do genomes interact within and among natural populations? What are some of the major genomic influences on: life-history patterns, stress responses, and the structure and function of ecological communities? How can we quantify meaningful genomic diversity and adaptation in natural populations? These are just a few of the questions that we can start to answer by applying cutting-edge genomic technologies to ecological questions. The knowledge we can gain is fascinating, incredibly useful, and critical to abate the current massive losses of biodiversity. In this course, we will gain an appreciation and understanding of rapidly evolving genomic technologies, learn how and why these technologies are applied to ecological questions, and marvel at the astounding insights we have gained. This course will cover

topics such as: basic and population-level genomics, genomic patterns underlying life-history events, and genomic responses to environmental stress. Students will be engaged with hands-on computational labs and exercises that introduce some of the analytical tools used in ecological genomics. Importantly, while this course will focus on genomics from an ecological perspective; the lessons learned will be applicable to a broad array of biological fields, which capitalize on genomic sciences, including medical biology.

### **LIF 3210 MEDICINAL CHEMISTRY: DRUGS, VITAMINS, AND ANTIBIOTICS**

*Prerequisites: Organic Chemistry 1 (PHY 3203)*

Our increasing mastery of chemistry over the past two centuries has led to the design and discovery of thousands of molecules that can impact human health. From the vitamin C deficiencies that plagued sailors during the Age of Exploration, to the discovery of antibiotics that revolutionized medicine, to the manufacture of addictive drugs such as heroin and methamphetamine, our ability to control our biochemistry through the actions of these compounds has profoundly changed us as a species. In this course, we will examine the chemistry behind the small molecules that affect human health. Questions to be addressed in this course include: How are new drugs designed, tested and approved? How are drugs metabolized in the body? How can we combat antibiotic resistance? How do vitamins work? How are natural products used in conventional and traditional medicines?

### **LIF 3211 CANCER BIOLOGY**

*Prerequisites: What is Life (LIF 2310) and Evolution (LIF 2110)*

Cancer is a leading cause of death in North America, and despite almost a century of modern medical research and billions of dollars spent, there is still no "cure" for cancer. Through the primary scientific literature, this course will explore the cell and molecular biology, genetics, and physiology of cancer to understand how cancer arises, why it is so deadly, and why it is so difficult to treat. Through Siddhartha Mukherjee's *The Emperor of All Maladies*, we will examine the medical, scientific, political and economic impacts that the modern "War on Cancer" has had in North America. This course will include a laboratory component.

### **LIF 3301 NEUROPSYCHOLOGY**

This course takes a top-down approach to understanding brain function. Though the primary level of emphasis in this course is behaviour, students will learn the basic structural and functional aspects of brain cell function to provide a necessary foundation. In addition, students will learn the basic approaches used to understand brain function, along with their limitations.

### **LIF 3305 THE NEUROBIOLOGY OF LEARNING AND MEMORY**

*Prerequisite: Concentration Level Neuropsychology or Neurobiology.*

How does the brain store and retrieve memories? What can studies of the brain reveal about the learning process? The course focuses on learning and memory from a neurobiological perspective. Students cover the variety of experimental approaches and model systems that have shaped our current understanding of these critical processes. Specific topics include a detailed study of synaptic plasticity from cellular, molecular and physiological levels. Other topics of coverage include the study of memory disorders associated with ageing and disease, their social implications, as well as current controversies in the field.

## LIF 3306 BRAIN DISORDERS

*Prerequisite: Concentration Level Neuropsychology or Neurobiology.*

Behaviour is the product of the brain and is influenced by both biological and environmental factors. It follows that disorders of behaviour are ultimately alterations of brain function at some level. This course examines a wide variety of neurological and psychiatric diseases, taking a systems- and molecular-level approach to understanding the mechanisms that underlie disorders of behaviour.

## LIF 3307 DRUGS AND BEHAVIOUR

*Prerequisite: Concentration Level Neuropsychology or Neurobiology.*

Many recreational and prescription drugs act directly on the brain. Since the final output of the brain is behaviour, several drugs also change behaviour in specific ways that can largely be explained by their underlying neurochemical effects. This course examines the mechanisms of drug action in the nervous system, and how some drugs lead to dependence and the subsequent development of addiction.

## LIF 3309 NEUROBIOLOGY

*Prerequisite: What is Life (LIF 2310) and Foundation Evolution (LIF 2110) or any course in cellular and molecular biology.*

This course examines brain structure and function, with an emphasis on understanding the biological mechanisms that ultimately underlie behaviour. Specifically, the focus is on the cellular, molecular, and systems levels of analysis, using animal models to discuss experimental approaches that are ultimately aimed at explaining human behaviour.

## LIF 3310 SPORTS AND EXERCISE PSYCHOLOGY

What distinguishes top athletes from their skill-matched opponents? Being an athlete requires more than physical ability and coordination. In this course, we will explore how psychological factors influence sport and exercise behaviours. These factors include personality, motivation, anxiety, stress and coping strategies. We will discuss the latest research findings and will evaluate interventions adopted by athletes and their effects on performance. Sport and exercise influence physical health but can also influence mental health. We will explore the relationship (costs and benefits) between physical activity and mental health.

## LIF 3402 EPIDEMIOLOGY

Epidemiology is the study of health and disease across populations. It looks at when and where diseases occur to prevent illness. It is the main scientific method used in public health to identify disease risk factors, study outbreaks, to inform evidence-based medicine, and to inform public health policies. Using a variety of examples, students learn how to measure health, design health studies (descriptive, observational, and experimental) and interpret data. Upon completion, students will be disease detectives and able to critically examine health literature and design their own health study.

## LIF 3403 NUTRITION

*Prerequisites: Foundation Evolution (LIF 2110) and What is Life? (LIF 2310).*

Food and nutrition underpin social, economic, environmental and institutional successes of human society. Students begin with a foundation in the basic scientific principles of human nutrition, then later apply these concepts to current nutrition issues. Some of the questions addressed include: If we are what we eat, what should we eat? Which nutrients are required for health? Which foods are rich sources of these nutrients? How does your body extract the energy and nutrients it needs from the food it consumes? What are the physiological consequences of different diets? Of different lifestyles? What are the ecological, political and economic consequences of the food choices we make?

## LIF 3405 INFECTIOUS DISEASES: INTRODUCTION TO MICROBIOLOGY AND IMMUNOLOGY

*Prerequisite: Foundation Evolution.*

The immune system is a highly complex and continually evolving mechanism for fighting foreign organisms, such as viruses and bacteria. Introduction to Microbiology and Immunology explores different types of micro-organisms, how they are transmitted, their interaction with the human body, the challenges they pose, and how infectious diseases can be prevented. Students are also given an overview of the ways in which the immune system works to recognize foreign bodies, fights off invaders, and remembers the lessons learned to expedite future defenses.

## LIF 3407 HUMAN ANATOMY AND PHYSIOLOGY A

*Prerequisites: Foundation Evolution (LIF 2110) and What is Life? (LIF 2310)*

This course is an introduction to the study of human anatomy and physiology. We examine how structure and function are inextricably linked in the skeletal, muscular, cardiovascular and respiratory systems. How do these systems work together to keep a human alive and healthy? We primarily study the human body in the "normal" healthy state but consider how anatomy and physiology are altered by a number of clinical conditions. This course involves a large component of hands-on learning using models and cadavers as well as observations and experimentation with live humans. Human Anatomy & Physiology A, B and C can be taken in any order.

## LIF 3408 MOLECULAR GENETICS

*Prerequisite: Foundation Evolution and What is Life?*

What physics was to the 20th century, biology will be to the 21st. The identification of DNA as the molecule of heredity in 1953 opened the door to an explosion of knowledge about the functioning of all living things. Genetics will play a role in solving many of the world's problems, offering strategies for improving global health, nutrition, energy sources, and global climate and environmental change. A basic understanding of molecular genetics is required to make sense of many of the recent and exciting developments in the field of biology and is necessary to pursue health sciences in any depth at a more advanced level. Molecular genetics investigates the molecular mechanisms of how genes manifest as functional units. This includes understanding DNA and gene architecture, gene expression, and mechanisms underlying gene transmission and inheritance. This course will focus on eukaryotic systems, particularly plants and humans, and will scale from the single gene unit to a systems approach looking at gene networks and population genetics, including an introduction to bioinformatics, biostatistics and computational biology. This course includes a laboratory component.

### **LIF 3409 PUBLIC HEALTH POLICY**

How are public health policies created and implemented? What do good public health policies entail? This course begins by learning about the Canadian health care system. We then examine public health policies in Canada and elsewhere with a focus on key concepts, strategies, challenges and their outcomes. Examples include historic achievements (e.g. vaccine-preventable diseases, tobacco control, maternal and infant health) as well as new and cutting-edge policies.

### **LIF 3410 SOCIAL DETERMINANTS OF HEALTH**

What are the determinants of health in a given population? What is the role of social, environmental, economic and political factors in health and health care? Do these factors contribute to health disparities across regions and socioeconomic groups? This course provides an introduction to the determinants of health. An emphasis is placed on the social determinants of health, including: socioeconomic status, education, race, gender, access to health and social services, neighbourhood environments, social relationships, and political economy.

### **LIF 3411 EXERCISE TESTING & PRESCRIPTION**

Students will assume the role of exercise professionals and learn to perform comprehensive fitness assessments and interpret results in the context of both health outcomes and athletic performance. Several methodologies for assessing each element of fitness (body composition, flexibility, muscular strength/power/endurance, aerobic and anaerobic capacity, and balance/agility) will be critiqued in terms of accuracy, precision and practical utility. Students will also apply principles of exercise prescription and design training programs to improve health- and performance-related fitness.

### **LIF 3412 HUMAN ANATOMY AND PHYSIOLOGY B**

*Prerequisites: Foundation Evolution (LIF 2110) and What is Life? (LIF 2310).*

This course is an introduction to the study of human anatomy and physiology. We examine how structure and function are inextricably linked in the urinary, digestive and reproductive systems. How do these systems work together to keep a human alive and healthy? We primarily study the human body in the "normal" healthy state but consider how anatomy and physiology are altered by a number of clinical conditions. This course involves a large component of hands-on learning using models and cadavers as well as observations and experimentation with live humans. Human Anatomy & Physiology A, B and C can be taken in any order.

### **LIF 3413 EXERCISE PHYSIOLOGY**

*Prerequisites: Human Anatomy and Physiology A.*

In this course, students will design and conduct laboratory and field experiments to address important questions in human exercise physiology. How do we fuel exercise of different intensities and durations? What limits maximal exercise? How do the respiratory, cardiovascular and neuromuscular systems respond to an acute bout of exercise? What are the effects of chronic exercise (training) on these systems? What happens during recovery from acute exercise and during detraining? We will also explore the physiology of ergogenic aids and of exercise in altered environments and special populations.

### **LIF 3414 PHYSICAL ACTIVITY & HEALTH**

We know that daily physical activity is good for us, but do we understand why? How does regular exercise contribute to physical and mental health and increased quantity and quality of life? How can exercise be used to treat and even prevent disease? How much physical activity do we need? Is it possible to have too much of a good thing? Throughout this course we will focus on assessing the available evidence to find answers to these questions and more. Topics of interest will include obesity, diabetes, cardiovascular disease and depression.

### **LIF 3415 HIGH-ALTITUDE PHYSIOLOGY**

*Prerequisites: Human Anatomy and Physiology A.*

In this field course, we will study (and experience) the effects of high-altitude exposure on the human body. Students will design and conduct research projects to investigate the responses of the cardiovascular, respiratory and urinary systems to the low oxygen environment. The effects of various exposure paradigms (intermittent versus continuous) and durations (from seconds to many generations) will be considered. We will discuss high-altitude medicine and compare the pathophysiology of altitude illness with cardiorespiratory diseases that occur at sea level.

### **LIF 3416 HEALTH BEHAVIOUR AND PROMOTION**

Understanding why people choose to engage in certain behaviours and activities underpins public health practice and policy. In this class, we explore methods used to promote and evaluate behaviour change across scales and organizations. We will apply our knowledge to identify real-life problems to design appropriate health promotion programs and the criteria for evaluating their outcomes. Behaviour change theory goes beyond public health and has been applied to many other fields. Most recently, it has been used to address environmental issues, sustainability and our changing technological landscape.

### **LIF 3417 HUMAN ANATOMY & PHYSIOLOGY C**

*Prerequisites: Foundation Evolution (LIF 2110) and What is Life? (LIF 2310).*

This course is an introduction to the study of human anatomy and physiology. We examine how structure and function are inextricably linked in the integumentary, lymphatic, nervous and endocrine systems. How do these systems work together to keep a human alive and healthy? We primarily study the human body in the "normal" healthy state but consider how anatomy and physiology are altered by a number of clinical conditions. This course involves a large component of hands-on learning using models and cadavers as well as observations and experimentation with live humans. Human Anatomy & Physiology A, B and C can be taken in any order.

### **LIF 3418 IMMUNOLOGY**

*Prerequisites: Foundation Evolution (LIF 2110) and What is Life? (LIF 2310).*

Every day, our body is invaded by bacteria, viruses, and other would-be pathogens that, unchecked, would use our body's resources, weaken, and kill us. The immune system is an impressive collaboration of specialized cells that continually evolve mechanisms to recognize and defend our body from invaders. In this course, we will meet these sentinels and soldiers of our body that keep us healthy and disease-free. Focusing on the molecular and cellular mechanisms of immunity, we will investigate how the body fends off an infection, how vaccines work and how to develop new ones, how organ transplants were made possible, and what happens when the immune system is deregulated, leading to such chronic diseases as diabetes, arthritis, multiple sclerosis and cancer.



### LIF 3419 EVIDENCE-BASED HEALTH PRACTICES

How do we evaluate the effectiveness of health practices? Which foods are healthy? What forms of exercise best improve overall health? Advising individuals on health practices can be a challenging task given the ever-changing landscape of health and wellness trends. Indeed, bold statements on the putative benefits of specific practices can make it difficult to discern fact from fiction. This course will be aimed at discussing the merits of various health practices by critically evaluating the available evidence surrounding their use. By employing an evidence-based approach, students will engage in discussions on a wide range of topics from nutrition, treatment and prevention of disease to exercise. The overarching goal of the course will be to engage in critical thinking as a means of evaluating available evidence relating to health practices in the context of health promotion.

### LIF 3420 AGING

*Prerequisites: Evolution (LIF 2110) or What Is Life? (LIF 2310)*

Why do we age? This course will build on a basic knowledge of genetics and molecular biology to explore aging. We will start with the molecular mechanisms that underpin aging, considering the role these processes play in normal development and hence, why aging is programmed into the genome. We will investigate diseases characterised by early-aging (progeria syndromes) as well as those that carry age as the primary risk factor (dementia, cancer) and ask how understanding these diseases can help us understand how and why we age. We will also discuss our relationship with aging and death, the socioeconomic impacts of an aging population, as well as the current hot topic of doctor-assisted suicide. Finally, we will debate and discuss the recent surge in immortality research initiatives by companies such as Google. Students will present a major written research project on an aspect of aging-related research of their choosing in a public symposium for the Squamish community. This course will include a laboratory component.







# MATHEMATICS

Students must complete one block of mathematics, selected from any of the following choices. Alternatively, completing the Concentration course Multivariable Calculus (MAT 3103) exempts students from this Foundation requirement. To receive the exemption, students must submit a completed Foundation Requirement Substitution Form to the Registrar's Office.

## MATHEMATICS FOUNDATIONS

### **MAT 2001 MATHEMATICS: A HISTORICAL TOUR OF THE GREAT CIVILIZATIONS**

Mathematics is the oldest of the liberal arts, yet few are aware of its vast and subtle influences on our lives. It is a practical tool, to be sure, but it has also played a major role in shaping who we are and how we think. Historically, mathematics has helped end old regimes and modes of thought and constructed new ones. This course takes a grand tour through the dominant mathematical cultures: ancient Babylon and Egypt, ancient Greece, medieval Islam, pre-modern China, and Europe today. We discover how mathematics shaped, and was shaped by, the people who practiced it, how it interacts with worldviews and alters ideas.

### **MAT 2004 SPHERICAL TRIGONOMETRY**

Born from the study of celestial motions in ancient Greece, spherical trigonometry became a standard part of the repertoire of mathematicians, astronomers, and navigators until it was almost forgotten in the late 20th century. This course will take a primarily mathematical view of this beautiful subject, bringing in astronomical history to provide context. Topics include the properties of a spherical triangle, both right and oblique; Menelaus's Theorem; the Rule of Four Quantities; the Law of Sines; Delambre's and Napier's analogies; duality; areas and the spherical excess; relations to plane trigonometry; applications to polyhedra; and the role of stereographic projection.

### **MAT 2006 MATHEMATICAL IDEAS IN FINANCE**

How can thinking like a mathematician help us make good financial decisions? In this course, we will discover the mathematical structures behind savings and investments, debt and mortgages, inflation, and exchange rates. We will analyse, interpret, calculate and reflect, then consider how to communicate and justify our findings. And we'll see that the same mathematical models apply to other scenarios – the mathematics which allows us to plan for retirement can also save us from a caffeine overdose!

### **MAT 2008 MATHEMATICAL PROBLEM-SOLVING**

This course is about the heart of mathematics, a collection of beautiful problems connected in unexpected ways. The problems are chosen from a wide spectrum, ranging from recreational puzzles and brain teasers to contest problems. Students will also read a math novel, in which the main character learns the art of problem-solving and through that process, develops insight, imagination, confidence, creativity, and critical thinking. Students will use this novel as a springboard to reflect upon their own mathematical journey and explore how problem-solving principles and techniques can be applied to address some of society's toughest challenges

### **MAT 2012 MATHEMATICS THROUGH INTERESTING PROBLEMS**

The purpose of this course is to explore advanced mathematical thinking through basic mathematics. I hope to convince you that mathematics exists simultaneously as both a formal system (truths, objects, relationships, procedures) and as a mental activity (questioning, reasoning, creating structure, justifying). Problems are at the heart of mathematics, but the Great Secret among mathematicians is that we love to make up new, interesting problems as much as we love to solve them. A great amount of intuition and creativity goes into posing and solving problems, and these qualities are as important as formal techniques. In this course, we will approach interesting problems in geometry, origami, puzzles, number theory, algebra and more, with the purpose of learning and critically examining thinking mathematically.

### **MAT 2015 EUCLID: THE CREATION OF MATHEMATICS**

One of the greatest books ever written, Euclid's Elements, systematized the contributions of the most brilliant mathematics of ancient Greece. Ever since, it has been the model for rigorous reasoning in Western and Islamic cultures. Its identification of definitions and axioms as the starting points of thought, and its use of formal deductive proofs, set the standard for demonstrations not just in mathematics, but also in legal codes, political debates, and other aspects of our culture. We shall deal intensively with the chapters on plane and solid geometry, and sample the sections relating to number theory. We shall also explore how the Elements has affected the way we think (mathematically and otherwise) in other Greek, Muslim and European texts, especially conic sections, Descartes' Discourse on Method, and the invention of non-Euclidean geometries and levels of infinity in the 19th century.

### **MAT 2021 GAMES AND NUMBERS**

We will explore simple "games of no chance" where there is neither randomness nor secrets, only strategy. Understanding these games will lead us to some mathematical topics including modular arithmetic, binary numbers, polynomials from high school algebra, and the study of adding up positive integers. (Yes, there is rich field of mathematics called partition theory that is all about adding numbers.) These will be our tools for analyzing interesting games, especially figuring out how to win.

### **MAT 2022 PUZZLES, PARADOXES AND THE INFINITE**

Puzzles, riddles and games have been essential in the development of mathematics. In this course, we will look at many such puzzles, often encountering seemingly paradoxical results. We will explore questions about probability, self reference and infinity, ultimately answering questions such as: What does it mean for one kind of infinity to be larger than another? Is there just one or many possible mathematical universes? This will lead us to a better understanding of the nature of mathematics, truth and reality.

## **MAT 2023 MATHEMATICAL LITERACY**

Learning a language—studying vocabulary, and grammar, and using those building Blocks to express complex ideas—is a familiar process. How does one become fluent in the language of mathematics? In this course we look at the basics that will enable us to feel comfortable engaging in math, and to think like a mathematician: conscious problem-solving, and logic; building a “number sense”; and basic mathematical models (translations of problems into the language of mathematics).

# **MATHEMATICS CONCENTRATIONS**

## **MAT 3003 COMPLEX NUMBERS: SIMPLIFYING THE REAL**

In some cases, the simplest way to reach real solutions to mathematical problems is through the complex numbers. Let’s take a closer look at some historically rich mathematical tapestries for which complex numbers are a common golden thread. Electrical circuits? Complex. Fractal dust? Complex. Complicated-looking trigonometric formulas? Actually, it’s simple: complex. Some topics that may be covered in this course are complex numbers and algebra, isometries and other geometry in the complex plane, and complex functions, including the derivative.

## **MAT 3005 MACHINE LEARNING**

*Prerequisite: Calculus, and knowledge of programming (preferably Python).*

Machine Learning has been at the centre of most technological advances this century, with numerous applications to health care, education, finance, transportation, environmental sustainability, and many more. In this course, we’ll uncover the mathematics behind some of the most important algorithms of supervised and unsupervised machine learning, such as neural networks, linear and logistic regression, decision trees, support vector machines, k-nearest neighbors, k-means, hierarchical clustering, dimensionality reduction, etc. Furthermore, we’ll learn some techniques to improve and optimize these algorithms and to apply them to real data.

## **MAT 3101 CALCULUS 1: THE SPIRIT OF CALCULUS**

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

The Spirit of Calculus is an introduction to the tool that made mathematics the foundation of our scientific view of the universe. A culmination of efforts to grasp continuously changing quantities, the calculus provides us with the capacity to capture and analyze intuitions of motion and change. The key to the problem, the ability to describe and use the infinitely small, has far-reaching effects and applications in the physical and social sciences, engineering and economics. The course culminates with an unexpected grand synthesis of the mathematics of speed and areas in the Fundamental Theorem of Calculus. Students will be required to demonstrate proficiency in working with algebra and multiple representations of functions to be admitted to the course. Information about the assessment will be emailed to enrolled students.

## **MAT 3102 CALCULUS 2: THE PRACTICE OF CALCULUS**

*Prerequisite: Calculus 1: The Spirit of Calculus.*

The Practice of Calculus emphasizes how the central ideas of the calculus work themselves out in various disciplinary contexts. Students begin by extending our ability to integrate functions, then apply their new powers to explorations of applications in physics, biology, chemistry, economics, and several other fields. When standard techniques fail, students explore the use of infinite series to manipulate functions otherwise beyond our reach. Finally, students examine the fundamental tool of modeling in the sciences, differential equations.

## **MAT 3103 MULTIVARIABLE CALCULUS**

*Prerequisite: Calculus 2: The Practice of Calculus.*

Handling several variables at once, a situation common in the physical sciences, requires extending the notions of differentiation and integration to multiple dimensions. These extensions greatly enhance the ability of calculus to serve as a modeling tool and are the foundation of such subjects as electrical flow, fluid dynamics, and mass/density/gravitation. In addition to partial differentiation and multiple integration, students explore changes of coordinates, parametrically-defined functions, and some vector calculus.

## **MAT 3104 DIFFERENTIAL EQUATIONS AND DYNAMICAL SYSTEMS**

*Prerequisite: Calculus 2: The Practice of Calculus.*

A key to discovery in science is often the transition from describing how things change to how they behave. Focusing the calculus on this problem in celestial mechanics led to the field of differential equations, the language of the mathematical physical sciences. Recently, technology has expanded our modeling tool set in various ways, opening up the study of chaos theory. Emphasizing the core concept of modeling, students explore the analytic, computational, and visual aspects of differential equations and their discrete analogues.

## **MAT 3105 REAL ANALYSIS**

*Prerequisite: Calculus 2: The Practice of Calculus.*

In Real Analysis, we explore several of the deep subtleties lurking hidden in the basic mathematical constructs of number, sets, size, logic and functions. We articulate working definitions of infinity, distance, continuity and smoothness, and use them to build, via axioms, theorems and proofs, a clear and stand-alone foundation for modern mathematics, in particular for calculus.

## **MAT 3201 LINEAR ALGEBRA**

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

Mathematical applications in the sciences often require the manipulation of many variables at once. Information concerning these variables, coded in matrices and vectors, can be manipulated to produce powerful results in disciplines as diverse as medicine, population dynamics and meteorology. Students explore some of these applications as motivations for topics such as solving systems of linear equations, matrix and vector operations, linear independence and vector spaces, eigenvalues, and other topics.

## **MAT 3202 ABSTRACT ALGEBRA: THE MATHEMATICS OF SYMMETRY**

*Prerequisite: Linear Algebra.*

The solution of the cubic equation in the 16th century enabled algebraists to reach unprecedented heights. However, the cost of progress was admitting into mathematics strangely behaving objects such as negative and complex numbers, and eventually quaternions and more. Students analyze the properties of these objects (categorized as groups, rings and fields), and study applications to symmetries, crystal structures, calendars, etc. Finally, students apply Galois theory to explain why the three classical Greek construction problems (squaring the circle, trisecting the angle, and doubling the cube) are unsolvable.

## **MAT 3203 DISCRETE MATHEMATICS**

*Prerequisite: Any Foundation Math Course and completion of Algebra, Graph, Number & Measurement Q-Skill Strands.*

How can mathematics improve society and empower us to live more effectively and equitably? We tackle this question from the perspective of Discrete Mathematics, applying mathematical structures such as graphs and Block designs to solve real-world problems, and communicate solutions with rigour and concision. Specific topics include: graph theory, combinatorics, coding theory, scheduling theory, classical game theory, and combinatorial game theory. Students will complete a personal project, where they will select a societal issue or injustice that lights a fire in their heart and apply mathematical techniques to propose a solution.





# PHYSICAL SCIENCES

Understanding how we can make sense of the way that aspects of the physical world move and are shaped (from atoms to planets) is the goal of the Foundation physical science courses. To this end, students take an Energy and Matter course as well as an Earth, Oceans, Space course from the choices below.

## PHYSICAL SCIENCES FOUNDATIONS

### PHY 2101 EXPERIMENTAL PHYSICAL SCIENCE

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

At its cutting edge, science uses experiments to both guide and test its evolving description of reality. Experimentation can also be a means by which one can become familiar with the vocabulary and concepts of science. In this course, students use experimentation to directly access a description of the physical world. Nearly all the class hours of this course are spent executing experiments designed in various degrees by small groups of students. Some of the questions that experiments address are: How big are molecules? How is energy transformed? How can you measure the speed of light? How can you trace energy through a phase change? Experiential exposure to these kinds of concepts forms a useful foundation for hands-on learners that can be applied to their future science education and/or daily life.

### PHY 2105 INTRODUCTION TO PHYSICAL THEORY

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

How do scientists develop theories about microscopic systems? Introduction to Physical Theory explores how scientists are able to describe and predict behaviours of different states of energy and matter. This course will examine seminal physics and chemistry experiments and discuss their importance in today's society. This course will also give Foundation students an appreciation for how scientific theories evolve and improve over time.

### PHY 2108 SOLAR POWER

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

An algebra-based course covering the scientific practices pertinent to the theme of solar energy. Quantitative analyses will address the thermal kinetics and nuclear-fusion processes in the sun, the electromagnetic foundations of the electrostatic and chemical potential energies in semiconductors and other photovoltaics, and the physical chemistry and efficiency of heat engines. Emphasis will also be placed on the communication of the data and results from laboratory exercises.

### PHY 2207 EARTH SYSTEMS AND HUMAN IMPACTS

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

Students begin by focusing on the practices of geological inquiry while exploring content related to rock composition, mountain building, erosion, and long-term Earth cycles. They continue briefly into the methods of extracting economically valuable resources (e.g., petroleum or minerals) from rock formations. Environmental problems related to resource extraction are then considered, and methods of environmental science are presented. The course then moves to a substantive treatment of climate science and ends with special topics that may vary between different instructors. Core points of emphasis throughout the course are quantitative analysis of geological and environmental data and the creation of cogent arguments that use technical information. This course fulfills the Earth-Oceans-Space Foundation requirement.



## PHYSICAL SCIENCES CONCENTRATIONS

### PHY 3001 EXPLORING THE HYDROLOGICAL CYCLE

*Prerequisites: Foundation Energy & Matter and Earth, Oceans, Space.*

This course follows the path of a molecule of water on its journey through a Coast Mountain drainage system. The focus is on the three major processes involved in the hydrological cycle: precipitation/accumulation, runoff/drainage, and storage/evaporation. Students experience these processes first-hand in 4-5-day expeditions; visiting an alpine glacier in week one, a river basin in week two, and the ocean in week three. We investigate the physical, chemical, and ecological role of water in each of these locations as well as learn outdoor leadership rescue and survival skills. In addition, each student leads in-depth discussions on two books focusing on the human relationship with water.

### PHY 3002 EARTH MATERIALS

*Prerequisite: Foundation Earth, Oceans, Space.*

This course explores the fundamentals (chemistry, physics and thermodynamics) of mineral and rock formation through investigation of primary literature, field excursions, lab projects (including petrographic microscope analysis), and class presentations and discussions. Other topics include: physical properties of rocks, minerals, soils and freshwater. The formation, extraction and uses of crustal resources commonly found in and on the Earth (precious metals, oil and gas, groundwater, nuclear materials) are also investigated. (Prereq: Foundation Earth/Oceans/Space)

### PHY 3003 TECTONICS OF WESTERN NORTH AMERICA

A field-based course designed to investigate deformation of the North American continent over the last 150 Million years. Geologic mapping is a major theme in the course. In doing so, students hone specific observational skills (rock and mineral identification, geologic structure identification, stratigraphic relationships, etc.) in the context of plate tectonic theory.

### PHY 3004 VOLCANOLOGY

*Prerequisite: Earth Materials*

An exploration of the processes leading up to, the events during, and the products created by volcanic eruptions. Volcanic phenomena are placed in a human and plate tectonic context culminating in a field excursion to an active or recently active volcanic area. Proposed areas are Hawaii, Yellowstone National Park and Mt. St. Helen's as well as Mt. Meager and the Garibaldi Volcanic Belt. Note: there will be a \$700CDN course fee for this class and students will need to organize and fund their own flight.

### PHY 3006 OCEANOGRAPHY

*Prerequisite: Foundation Earth, Oceans, Space (EOS) course.*

An introduction to the oceans and the processes that have shaped them, their composition and movement, waves, tides, beaches, interactions with the atmosphere and human exploitation of the non-living resources.

### PHY 3007 RESEARCH IN EARTH AND ENVIRONMENTAL SCIENCES

*Prerequisite: Foundation Earth, Oceans, Space.*

This course explores state-of-the art research in the broad and diverse fields of earth and environmental sciences, culminating with attendance at the Geological Society of America National Meeting. Attendance at the four-day conference allows students to interact directly in formal and informal sessions with presenters and panelists on topics such as: Environmental Geoscience, Engineering Geology, Archeological Geology, Economic Geology, Geology and Public Policy, Marine and Coastal Science, Geoscience Information and Communication as well as specific subfields like Volcanology, Limnogeology, Paleoclimatology, Hydrogeology, Planetary Geology and Petroleum Geology. Students will investigate, in-depth, several topics of their choosing from the conference's diverse program, allowing them to explore different modes of research (e.g., field, experimental, empirical, theoretical) and preparing them to engage in questions at the forefront of cutting-edge earth and environmental science and policy research. This is an unparalleled chance to see how real-world science works.

### PHY 3008 REMOTE SENSING OF THE ENVIRONMENT

*Prerequisite: Foundation Energy & Matter and Earth, Oceans, Space.*

Environmental Science is built upon the foundation that we can collect data to better inform ourselves about the natural world. Unfortunately, the information these studies are based on is commonly limited to a few field samples taken only when we can get access to the sites. Field work is fun, but what if we could supplement that with a way to monitor large areas with much greater frequency? Well, there is! Using satellite technology, we have access to datasets that can cover much larger areas with much greater frequency, giving us a powerful tool to assess changing environmental conditions with much greater temporal and spatial sophistication. In this course, we will figure out how remotely sensed data can be used in two hot areas of environmental science: groundwater resources and ocean temperature change. These areas are relevant in a larger global context of freshwater management and global climate change respectively. The class will consist of two large projects that we will work on together as a team. We'll focus a lot of attention on how to critically read technical scientific papers and then we'll work with actual datasets from NASA and the European Space agency to evaluate and predict trends in these important and changing environmental conditions.

### PHY 3009 COMPUTATION IN THE PHYSICAL SCIENCES

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

Take your Question to the next level with a high-level computational software: MATLAB! Students begin with the basics of coding in the first few days: variables, loops and functions. Ultimately, students will use MATLAB to analyze their own datasets in a term project. For preparation, students will do a number of examples together as a class. We will investigate a range of different physical phenomena by analyzing datasets — think geophysical data, remote sensing data, and data from engineering material tests. The mathematics behind each example will be introduced during individual study time, and in class we will review that material and tackle each dataset together. Think of it as a two-hour hackathon each day of the Block. An additional benefit of this Block is that the pace will ultimately be set by the students — the more problems we get through as a group, the more of the wonderful world of MATLAB you will see.



## PHY 3010 FIELD GEOLOGY

*Prerequisites: Earth, Oceans, Space and Earth Materials*

The intent of this course is to introduce students to the skills, techniques, conventions, applications and beauty of doing Geology in the field. Students will apply basic rock identification skills and knowledge of geologic systems to real world geologic problems by mapping relatively simple through unfathomably complex geologic formations through a series of short field trips. The course will start with basic mapping and analysis of structurally deformed sedimentary packages. In doing so, students will learn standard techniques used in the field including GPS location and navigation, use of Brunton compass for structural measurements and field drafting of a map. These basic skills will then be applied to mapping and analysis of more complex metamorphic assemblages. Finally, the course will end with mapping and analysis of mind-boggling, seemingly unsolvable, igneous sequences. Throughout, students will be making original maps of selected areas and telling intricate and fascinating geologic stories about select parts of our earth system.

## PHY 3011 EARTH SURFACE PROCESSES & LANDSCAPE EVOLUTION

*Pre-requisite: Foundation Earth Systems and Human Impacts.*

In this course, students will build a quantitative understanding of the processes (e.g., soil formation, sediment production, sediment transport, river incision and deposition, glacial erosion and deposition) that are essential to understanding the dynamic and complex physical system that is the Earth's surface. From the steep, glaciated terrain of the Coastal Ranges, to the wide, alluvial floodplain of the Squamish River valley, we will take advantage of the natural laboratories surrounding Quest University to lead students on an observation-based exploration of the processes that shape the landscapes around them. Throughout the course, we will focus on understanding the role of humans and climate in controlling the rates and magnitudes of landscape evolution against a geological and hydrological backdrop. Students will learn essential geomorphology theory, tackling mechanics of sediment transport in the context of several independent investigative projects that focus on making observations about landforms shaped by glacial, fluvial, and hillslope processes, respectively. Each of the projects will require and develop: field investigation techniques, quantitative and analytical skills, and clear, concise scientific writing.

## PHY 3012 DIGGING INTO SOIL SCIENCE: A COMPREHENSIVE INTRODUCTION

*Prerequisite: Foundation Earth, Oceans, Space. Experience in Geographic Information Systems in Multidisciplinary Studies would be beneficial but is not required.*

Soil is the critical intersection of the hydrosphere, lithosphere, biosphere, and atmosphere – it is this living, breathing interface that makes life possible on Earth. This course is a field and laboratory-based inquiry into soil science. The course objectives are threefold: (1) to understand the solid, liquid, gas, inorganic and organic components of soil and their synergistic interactions that determine soil's unique properties; (2) to gain hands-on experience describing, sampling and classifying soil profiles using a combination of field and laboratory methods (e.g., the Canadian System of Soil Classification); and (3) to begin to identify soil properties and soil-landscape patterns using Geographic Information Systems (GIS). Students will develop an understanding of the processes of soil profile formation in the context of external forcing factors (e.g. regional geology, landscape morphology, and climate) and internal processes (i.e. biogeochemistry of the soil environment). This is a project-based course where students maintain detailed field and lab notebooks as part of data collection. The remainder of the graded material will consist of written laboratory

reports. This course is complementary to Spatial Ecology (LIF 3026), which will use GIS for similar environmental spatial analysis in the discipline of ecology.

## PHY 3013 CYCLES IN EARTH SYSTEMS

*Prerequisite: Foundation Earth, Oceans, Space.*

This course focuses on biogeochemistry, the interdisciplinary scientific field of study that examines the transport and fate of elements crucial for life (carbon, nitrogen, oxygen, nitrogen, phosphorus) through the major "spheres" of our planet (biosphere, atmosphere, hydrosphere, lithosphere). Biogeochemical cycling results in the transformation of elements as they move through the different spheres at various scales and rates; characterizing and documenting their movement has important implications for understanding a wide array of scientific topics including early life on Earth, the regulation of Earth's climate and environment, and future changes due to human activity. Using an interdisciplinary combination of literature reviews, discussions, and field trips, students will have the opportunity to delve into an area of their interest and present their findings to peers.

## PHY 3014 GEOMORPHOLOGY

*Pre-requisite: Foundation Earth Systems and Human Impacts.*

In this course, students will build a quantitative understanding of the processes (e.g., soil formation, sediment production, sediment transport, river incision and deposition, glacial erosion and deposition) that are essential to understanding the dynamic and complex physical system that is the Earth's surface. From the steep, glaciated terrain of the Coastal Ranges, to the wide, alluvial floodplain of the Squamish River valley, we will take advantage of the natural laboratories surrounding Quest to lead students on an observation-based exploration of the processes that shape the landscapes around them. Throughout the course, we will focus on understanding the role of humans and climate in controlling the rates and magnitudes of landscape evolution against a geological and hydrological backdrop. Students will learn essential geomorphology theory, tackling mechanics of sediment transport in the context of several independent investigative projects that focus on making observations about landforms shaped by glacial, fluvial, and hillslope processes, respectively. Each of the projects will require and develop: field investigation techniques, quantitative and analytical skills, and clear, concise scientific writing. Note: There is an additional \$100 course fee for transportation and camping fees.

## PHY 3101 PHYSICS 1: INTRODUCTORY MECHANICS

*Prerequisite: The Practice of Calculus [Calculus 2]*

A calculus-based study of motion and mass from the perspective of force, momentum, and energy. Angular motion, universal gravitation, orbits, and solid-body rotations are also covered. Data collection and other laboratory exercises are an important aspect of the course. Offered every year.

## PHY 3102 PHYSICS 2: INTRODUCTORY ELECTROMAGNETISM

*Prerequisites: Physics 1*

A calculus-based study of static and moving electric charges using the concepts of fields and the integral form of Maxwell's Equations. Data collection and other laboratory exercises concerning analog circuitry are an important aspect of the course. Offered every year.

## **PHY 3103 PHYSICS 3: THERMODYNAMICS AND HEAT**

*Prerequisites: Physics 2*

A calculus-based study of heat in systems. Examples of ideal gases and physical chemistry will be studied in terms of the relationships among macroscopic state variables and microscopic explanations including relativistic binding energy, chemical potential, and information entropy. Data collection and other laboratory exercises are an important aspect of the course. Offered every other year.

## **PHY 3104 QUANTUM MECHANICS**

*Prerequisites: Advanced Energy & Matter, Linear Algebra*

This course covers time-dependent one-dimensional systems and time-independent one- and three-dimensional systems using vector-operator algebraic formalism. Examples include atomic orbitals and molecular rotations. Offered every other year.

## **PHY 3105 ADVANCED ENERGY & MATTER (MODERN PHYSICS)**

*Prerequisite: Physics 2*

A calculus-based course covering modern physics. The wave nature of light is studied in theory and in laboratory exercises and applied to the wave nature of matter. The quantization of angular momentum is studied in nuclear, electronic and molecular systems. Offered every other year.

## **PHY 3106 LAGRANGIAN MECHANICS**

*Prerequisites: Physics 2 or Multivariable Calculus*

An introduction to classical mechanics as described using vector calculus, the calculus of variations, and numerical methods. Topics include coordinate transformations, non-inertial frames, damped & driven oscillators, and the normal modes of coupled oscillators. Offered every other year.

## **PHY 3107 SIGNAL PROCESSING**

One-dimensional Fourier and sampling theory will be introduced to recognize aliasing in spectra of acoustical signals. Other examples will include pulsed-laser chirping and radar ring-down fingerprinting. Using existing software, the harmonic content of various signals will be explored and exploited in the context of compression and information. Laboratory exercises in spatial filtering and Fourier optics will serve as an introduction to higher-dimensional problems such as interferometric imaging.

## **PHY 3108 FUNDAMENTAL BUILDING BLOCKS OF NATURE**

The fundamental building Blocks of nature are spelled out in the Standard Model of particle physics. The Standard Model is one of the most rigorously tested and most precisely known theories in physical science. This course will outline the theoretical and experimental underpinnings of this pillar of modern physics.

## **PHY 3201 CHEMISTRY 1: ATOMIC STRUCTURES AND CHEMICAL BONDING**

*Prerequisite: Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands. High School chemistry or approval from instructor.*

What does quantum mechanics have to say about the electron? How

does this view of the atom help us understand the periodic table of elements, chemical bonding and the world? Can the atom be divided into parts smaller than the protons, neutron and electron? Chemistry 1 is a course in the composition of matter, chemical bonding and simple reactions.

## **PHY 3202 CHEMISTRY 2: CHEMICAL THERMODYNAMICS AND KINETICS**

*Prerequisite: Chemistry 1.*

The study of thermochemistry is the exploration of the heat exchanges that take place during chemical reactions. This course reviews concepts of chemical kinetics (the mechanism by which chemical reactions take place, including calculation of the factors that affect their rate), chemical equilibrium, phase diagrams and the properties of solids, gases and liquids.

## **PHY 3203 ORGANIC CHEMISTRY 1**

*Prerequisite: Chemistry 1.*

Organic Chemistry 1 is an introduction to the chemistry of hydrocarbon compounds. The course begins with the nomenclature of organic chemistry, and a review of the structures, properties and reactivity of the common functional groups (alkanes, alkenes, alkynes, arenes, alcohols, ethers, esters, thiols and sulfides). Aromaticity, chirality and stereoisomers, and spectroscopy are studied.

## **PHY 3204 ORGANIC CHEMISTRY 2**

*Prerequisite: Organic Chemistry 1.*

This second part of the introduction to the chemistry of hydrocarbon compounds reviews the nomenclature, structures, properties and reactivity of additional common functional groups (benzenes, amines, aldehydes and ketones, enols, phenols, carboxylic acids, carbohydrates, amino acids, nucleic acids).

## **PHY 3205 BIOCHEMISTRY A: MACROMOLECULES AND GENE EXPRESSION**

*Prerequisites: Chemistry 1 and Organic Chemistry 1.*

This course focuses on the structure and function of the macromolecules that make up biological systems (proteins, nucleic acids, carbohydrates, and membranes). By investigating the fundamental chemical properties of these macromolecules, we develop an understanding of how they are synthesized and broken down, how they interact with each other, and how they contribute to the workings of a cell. Topics will include: molecular mechanisms of DNA replication, transcription, and translation; gene expression; protein structure; membrane properties; biochemical signaling; experimental techniques for the study of macromolecular structure and function.

## **PHY 3206 BIOCHEMISTRY B: BIOENERGETICS AND METABOLISM**

*Prerequisite: Chemistry 2 and Organic Chemistry 2.*

This course focuses on the chemical processes by which cells derive energy from their surroundings and use this energy to make the building Blocks of life. The major metabolic pathways involved in the synthesis and breakdown of high-energy molecules are investigated, along with the mechanisms of regulating these pathways in the body. In addition, we examine the inner workings of enzymes, the remarkably proficient catalysts that carry out the chemical reactions of life. Links between errors in metabolism and human disease are also explored.



## **PHY 3207 EXPERIMENTS IN THE PHYSICAL SCIENCES 1**

*Prerequisite: Chemistry 1 or Physics 1.*

The scientific curiosity of students is used to promote the experimental exploration of chemistry and physics concepts at a level that is appropriate to the student's background. Students are in direct control of how they use their time in the lab. Every hour spent in the lab requires about two hours of writing and reviewing background information. Also, a substantial quantity of time is required for planning the next day's activities. Assessment for the course is based upon a portfolio that serves to describe in detail the student's experience of the course.

## **PHY 3208 EXPERIMENTS IN THE PHYSICAL SCIENCES 2**

*Prerequisites: Experiments in Physical Sciences 1 and Calculus 1.*

Student-motivated experimentation is the driver for this course. Experiments involve a greater depth of understanding than Experiments in Chemistry 1 and draw from a greater vocabulary of chemical and physical concepts. Most experiments require many days to execute in the lab and students are encouraged to undertake investigations that are more comprehensive than in the prerequisite course. Assessment for the course is based upon a portfolio that serves to describe in detail the student's experience of the course.

## **PHY 3209 TECHNIQUES IN BIOCHEMISTRY AND MOLECULAR BIOLOGY**

*Prerequisite: Foundation Molecular Biology.*

*Strongly recommended: Biochemistry 1.*

What are the biochemical methods available to researchers in the laboratory? Techniques covered include breaking apart a cell, separating the chemicals found within it, and identifying and characterizing them. The goal is to understand the advantages and disadvantages offered by each method and be able to devise a purification protocol, given a specific cell type and molecule to purify. Half of this course is based on theoretical considerations, and half is spent in the laboratory. In the laboratory, students work from published articles and learn to convert the highly summarized information into a step-by-step protocol that can be carried out.

## **PHY 3210 INORGANIC CHEMISTRY: MOLECULAR DESIGN**

This course will focus on the middle of the periodic table (i.e., the transition metals), with some contribution from the s-Block and p-Block. We will discuss the fundamental properties of these metals as well as their contribution to the assembly of organic (carbon containing) molecular architecture. Important properties and reactions of the transition metals will be illustrated through real-world examples ranging from gemstones and catalysis to perfumes (amongst others). Inorganic chemistry informs our understanding of a range of subjects, from geology and environmental pollution to materials sciences.

## **PHY 3302 EXOPLANETS**

*Prerequisites: Any one course in the Physical Sciences.*

This is an introductory astronomy survey course. The topic of extrasolar planets is covered through studying the astrophysics of stars, star formation in the interstellar medium, and comparative planetology. A quantitative appreciation will be developed of contemporary exoplanet studies and the potential for habitable worlds. Weather permitting, basic observational astronomy skills will also be developed.

## **PHY 3505 WATER RESOURCES**

*Prerequisites: Earth-Oceans-Space and Political Economy; one or more of these can be waived with the permission of the instructor.*

This course focuses on the technical and quantitative aspects of water flow and water quality in rivers and river basins. With scientific principles established, it then moves into policy responses to water resources problems, invoking political, economic, and other social factors to understand why political jurisdictions exploit or preserve their water resources in specific ways.

## **PHY 3506 ENERGY TECHNOLOGIES**

*Prerequisites: Energy and Matter, Earth-Oceans-Space, Political Economy; one or more of these may be waived with the instructor's permission*

This course surveys the historic and modern energy technologies that power the developed worlds. Topics covered include the fossil-fuel-based, hydroelectric, wind and solar power plants; others are discussed according to student interest. These are explored from both technical and social standpoints. Students will leave the course understanding the physics and chemistry of power generation, as well as having considered difficult questions like the plausibility of natural gas as a bridge fuel, the regulatory environments of various political jurisdictions, the viability of a society powered by renewable energy technologies, and the implications of the drive by the developing world to deploy new power generation capacity at a remarkable rate. Students who have taken Energy and Matter: Fundamentals of Energy Sustainability, which will not be offered in 2015-2016 or 2016-2017, are welcome in this course and will be accommodated by a series of alternate assignments designed to take advantage of their prior experience in these topics.

## **PHY 3507 ENVIRONMENTAL CLIMATE SCIENCE: THE PHYSICAL AND ECOLOGICAL DIMENSIONS OF CLIMATE CHANGE**

*Prerequisites: Algebra, Graph, Number & Measurement Q-Skill Strands.*

This advanced climate sciences course focuses on environmental (i.e., non-human) aspects of climate change and climate sciences. A range of disciplines will be covered including (but not limited to) geology, hydrology, physics and ecology. Students will engage in project-based learning with a particular focus on biophysical data modelling and analysis. We will build toward performing a detailed vulnerability assessment for the Squamish region. Potential topics of focus in this assessment include changing forest fires regimes, snow-pack alterations, hydrological shifts and impacts to coastal systems.

**PHY 3508**  
**RENEWABLE ENERGY TECHNOLOGIES: FROM THEORY TO IMPLEMENTATION**

*Prerequisites: Chemistry 1 or Physics 1 or foundation Energy & Matter*

This course introduces students to the major renewable energy technologies available and how they are best applied in real-world settings. Students will begin by exploring the scientific underpinnings of current renewable energy technologies including wind, solar and biomass energy. The course will then assess the benefits, drawbacks, risks, expenses, and integration challenges of each technology in real-world settings, along with how these technologies can help to reduce carbon emissions. Finally, students will engage in a case-study problem by determining how best to power a community with renewable energy, mindful of that community's specific location and needs. Field trips and group project work will be included in this course.

**PHY 3601**  
**SCIENCE COMMUNICATION**

*Prerequisites: Any foundation life science and any foundation physical science.*

This seminar and project-based course explores pedagogical and communication techniques for formal Kinder-to-University teaching, accessibility, and public informal education within the contextual constructs of the physical and life sciences. Students will critique and produce communications of science material using formal and informal writing, oral presentation, imagery and models. This course is tagged as rhetoric-intensive.



# SOCIAL SCIENCES

Students are permitted to choose any three out of these four blocks to fulfill their Foundation requirement in the Social Sciences. Please note that all Concentration economics courses require Political Economy (SOC 2100) as a pre-requisite. Students planning to register in these courses later on are therefore advised to include Political Economy as one of their Foundation choices.

## SOCIAL SCIENCES FOUNDATIONS

### **SOC 2100 MARKETS IN THEORY AND PRACTICE**

*Prerequisites: Algebra, Graph & Number Q-Skill Strands*

When resources are scarce, individuals and societies must choose how to use them – and who gets them. Economics is the study of such choices, and Political Economy grounds that study in historical, political, and philosophical context. In this course, we will ask many questions about the distribution of a society's resources, as well as the role that markets and money play in that distribution. We will study the creation of money, what can and cannot be done with money, and how monetary policy can affect a country's economy. We will also examine what markets are, how they work, and when they fail, as well as address the successes and failures of market systems, in theory and in practice. As we do so, we will consider the effects that government can have on an economy, when government can limit failure, and when government is limited itself. We will conduct our studies by drawing upon relevant theory, as well as examples from numerous countries at various points in time – including examples from the most recent economic crises – as we study the choices societies have made about how to best manage their resources, the political and philosophical influences behind those choices, as well as their consequences.

### **SOC 2200 DEMOCRACY AND JUSTICE**

Democracy and Justice examines the theory and practice of politics from a variety of perspectives and disciplines. It considers the ways in which leading thinkers have responded to the particular political problems of their day, and how they have contributed to a broader conversation about human goods and needs, distributive justice, democracy, and the relationship of the individual to the state. It also helps students learn about current issues and structures in politics.

### **SOC 2300 GLOBAL PERSPECTIVES**

*Prerequisites: Graph & Number Q-Skill Strands.*

The aim of Global Perspectives is to orient the student toward contemporary problems around the world. Themes may include intercultural communications, globalization and development, international relations, and global social issues such as AIDS, poverty and environmental degradation. The course helps the student become more conscious of how people can converse across cultures and ethnicities, step outside of their own experiences, and appreciate the positions of citizens from a variety of origins.

Please note that different classes have different subtitles that indicate the topic of the course.

### **SOC 2400 SELF, CULTURE AND SOCIETY**

*Prerequisite: Graph & Number Q-Skills Strands.*

Self, Culture and Society will explore how our sense of self is affected by social and cultural forces. In this course, we will learn theoretical and experimental approaches to understanding the question of who we are. We will draw from the fields of psychology, sociology, anthropology and geography to investigate how we shape and are shaped by culture and society. Through examination of the interrelations between the individual, group, systems, and institutions, we can better understand the behaviours and actions of our everyday lives. Students interested in Questions within Social Sciences are encouraged to find out which Block of SCS will best prepare them for future Concentration courses in their areas of interest.

## SOCIAL SCIENCES CONCENTRATIONS

### SOC 3001 MICROECONOMICS: EXPERIMENTS & MODELING

*Prerequisite: Foundation Political Economy.*

Microeconomics is the study of the ways in which individuals and small groups of individuals make choices about their needs and wants. In Microeconomics: Experiments & Modeling, we will examine key economic theories that underlie commonly utilized mathematical models of individual behaviour, engage with the mathematical models themselves, and compare theoretical predictions with empirical data. As we do so, we will study experiment design and implementation, allowing us to better understand one means of testing our models of behaviour. Building on the concepts and techniques introduced in Political Economy, topics will include supply and demand in more depth, consumer theory (a mainstream economic model of utility [happiness] maximization by an individual), game theory (the study of strategic behaviour between individuals), and a crash course in experimental economics (a field of economics with a goal of scientifically testing theory). The course also examines policy issues from a microeconomic perspective.

### SOC 3002 MACROECONOMICS

*Prerequisite: Foundation Political Economy.*

Macroeconomics is the study of aggregate behaviours of economies. Drawing on the concepts and ideas introduced in Political Economy, topics include: the measurement of national income; economic growth; cycles of boom and recession; unemployment; inflation; budget deficits and surpluses; the role and structure of the banking system; interest rates; and the use of monetary and fiscal policy to stabilize the economy. Macroeconomics is an essential tool for informed citizenship and active public engagement. Macroeconomics involves a considerable amount of class participation and discussion on central issues facing the economies of North America and beyond.

### SOC 3004 BEHAVIOURAL ECONOMICS

*Prerequisite: Foundation Political Economy.*

Economics as a discipline often assumes people are rational and self-interested. Yet, when we look at the world around us, we see these assumptions violated, or at least they appear to be violated. In a course on Behavioural Economics, common economic assumptions are relaxed to allow for some behaviours that consistently appear in reality, such as over-optimism, procrastination, altruism, spite ... that standard economic theory has difficulty explaining. In this course, we will identify common irrationalities in the lives of well-loved literary characters, analyze our own behaviour and that of the world around us, propose experiments to test for anomalous behaviours and their causes, design models to capture empirical findings, as well as discuss policies that encourage or discourage irrational behaviour. We will also consider ways in which individuals, businesses, non-profits, governments... can utilize the findings of Behavioural Economics, for better or for worse.

This course is tagged as Rhetoric-intensive.

### SOC 3005 HETERODOX APPROACHES TO ECONOMICS

*Prerequisite: Foundation Political Economy.*

Mainstream economics is often accused of using unrealistic models of human behaviour, and of answering questions no one is asking. The course looks at alternative approaches to economics. Perspectives examined include: Marxist, feminist, Neo-Keynesian and religious approaches. Students look at alternative analyses of the monetary system and the role of government. Some knowledge of mainstream economics is advised.

### SOC 3006 BUILDING CANADA: CANADIAN ECONOMIC DEVELOPMENT AND HISTORY

This course examines Canadian history with a particular focus on the construction of the Canadian economy and how it influenced wider political and social developments. Themes studied will include the fur trade and its influence on early First Nation-settler relations; changing staples and the decline or advancement of colonies; the railway, industrialization and Confederation; agriculture and the expansion of the West; manufacturing and the power of the East; the great depression; and the centralization of decision-making in World War II. It will end with an examination of the new staples and regional power shifts since 1945. A focus on primary source material (and analysis), in addition to field trips and documentary films, will help bring these themes to life.

### SOC 3017 PUBLIC LIFE: CRITICAL DIALOGUES ON RACE & POLITICS

This course offers a critical introduction to the history of modern racial thinking in Western society, with particular emphasis on Canada and the U.S. Our examinations are organized around themes of power and resistance with respect to formations of slavery and colonialism. We will explore these themes as they have been taken up by scholars and activist academics in the overlapping fields of Black Studies, First Nations/Indigenous Studies, and Geography.

### SOC 3050 DEVELOPMENT: CAPABILITY, FREEDOM, AND AGENCY

*Prerequisite: Foundation Political Economy.*

What do we mean by "development?" Is it all just about increasing Gross Domestic Product (GDP)? In this course, students look at what the goals of economic development might be, drawing on insights from alternative measures of welfare and the Capabilities Approach. Students examine the experiences of the poorer countries of the world, looking at the challenges they face and the possible types of solutions to their problems. Both top-down and bottom-up approaches are analyzed.



## **SOC 3051 POVERTY, INEQUALITY, AND DEVELOPMENT**

*Prerequisite: Foundation Political Economy.*

Why are some countries rich and some poor? What has been done about it? What can be done about it? What should be done about it? In this course, we draw from the fields of Economic History, Experimental & Behavioural Economics, International Finance, Growth Theory and Development Economics in an attempt to answer the questions posed. Students examine the theories behind and the implementation of official and unofficial policy, as well as grassroots efforts, directed towards decreasing poverty, lessening inequality and encouraging development.

## **SOC 3052 CULTURE AND DEVELOPMENT IN LATIN AMERICA**

This course serves as a general introduction to the lands and peoples of Latin America (Mexico, Central, and South America). Key themes address the historical, social, and cultural realities that have shaped the region. Topics may include the varying nature of colonial experiences, problems of post-colonial development, indigenous resistance and survival, violence and revolution, gender inequalities, and development strategies. A range of resources including scholarly and creative writings, documentary and feature films are utilized to bring the region to life.

## **SOC 3053 DEVELOPMENT AND COMMUNITY IN BELIZE**

*Prerequisite: Foundation Political Economy.*

This course is set in Central America's only English-speaking country that is intentionally pursuing a development strategy based on sustainable tourism. The course aims to introduce students to the history and culture of Belize, and the ways in which these have shaped the economic and social development of the country. Students visit various parts of the country, including the barrier reef (the second-biggest in the world), and look at the threats and opportunities that the country faces.

## **SOC 3058 THE POLITICS OF HEALTH IN SOUTH AFRICA**

How do we make sense of the context-dependent peculiarities of and disparities in the distribution of health and illness in a particular place? This class endeavours to unpack this question by situating health and healthcare in South Africa within economic, political, demographic, historical and sociocultural dynamics. We will examine the historical roots and contemporary realities of health and healthcare, paying particular attention to rural dynamics, histories of Apartheid and power, South Africa's integration within contemporary global economic systems, internal inequalities and economic disparities, and political and ideological dimensions of healthcare delivery. In this course, students will familiarize themselves with various theoretical and categorical lenses surrounding health, healthcare delivery, the political economic of health, and the spatial dynamics of health, illness and healthcare. These lenses will serve as a basis through which to explore the situated, place-specific dynamics of health, illness, and healthcare delivery in South Africa.

## **SOC 3059 EXPERIENCING THE POLITICS OF SOUTH AFRICA**

*Prerequisite: Minimum B- mark in the affiliated course, "The Politics of Health in South Africa,"*

This travel class "Experiencing the Politics of Health in South Africa" will spend the Block in South Africa, providing students with experiential learning opportunities to examine the multiple political, economic, sociocultural, structural and spatial forces which differentially shape health, morbidity and mortality for different

bodies in South Africa. The course will highlight the successes and challenges of rural health care delivery in north-eastern South Africa, the variegated histories of health and illness in the country, the delivery of vaccines and related immunological health delivery issues, and the nation's HIV/AIDS epidemic. Visiting urban, peri-urban and rural settings, students will learn from and with leading South African and international scholars, health practitioners, and academic researchers. Earning a minimum of a B mark in the affiliated October course, "The Politics of Health in South Africa," is a prerequisite for participation.

Due to in-country vehicle logistics and safety concerns, this class is capped at 10 students and will be subject to a significant course fee. In addition to the course fee, you will be responsible for your round-trip airfare to Johannesburg. The course fee covers all lodging, food, travel, and activities. A \$250 non-refundable good faith deposit is due by the final day of the April Block. The remainder of the course fee (TBD) will be due September 1. Failure to meet either deadline will result in being dropped from the class.

## **SOC 3062 DEBT, DISCIPLINE, AND GLOBAL FINANCE**

Finance is perhaps the most salient feature of the present global political economy. The term finance encompasses a range of meanings, from algorithmic trading to collateralized debt obligations, all of which have been affected by tendencies toward speculation and crisis and, furthermore, rely upon ever-increasing amounts of data. Beyond the macro-level, finance is also deeply implicated in our everyday lives - from housing loans and rental payments to cell phones. This course has been designed to explore and make sense, historically, of finance and a variety of financial data through a variety of cases and interdisciplinary frames of political economy (political science, geography, sociology, history, gender studies). The course offers a wide range of theoretical perspectives, analytical tools and ideological inclinations within the interdisciplinary terrain of political economy.

## **SOC 3063 SCANDALOUS ECONOMICS: CRITICAL UNDERSTANDINGS OF BUBBLES, CRASHES, AND CRISES IN FINANCIAL MACROECONOMICS**

*Prerequisites: Markets, Theory & Practice (formerly Political Economy)*

This course critically examines the role that financial institutions and markets play in the modern macro economy. The course broadly addresses the following questions: Who benefits and loses from financial crises? Who defines and narrates financial crises? Structural inequalities that make possible the current economic order are understood through the lenses of gender, race and class. We will interrogate traditional economic theories that are used to both explain and dictate governmental responses to banking crises and asset bubbles, capital flight and international financial crises, the role of financial systems in monetary policy, and fiscal austerity as a response to financial crises. Topically, students will study the material, ideational, and representational dimensions of financial crashes, panics, and crises throughout history (Dutch Tulip Mania, the DotCom bubble, the Subprime Crisis) to highlight capitalism's systemic tendency towards crisis, as well as the gendered, racialized and class-based structure of the economy.

## **SOC 3101 COMPARATIVE POLITICAL INSTITUTIONS**

We cannot really understand our own government without understanding the governments of other countries. What are the different ways individuals and groups participate in politics? Why are some states stable democratic systems while others are not? What relationship does a country's political organization have with its economic performance and social stability? Can we really say that one government is "better" than another? This course provides students with the necessary tools to make informed judgments about "the government."



### **SOC 3103 CONTEMPORARY POLITICAL IDEOLOGIES**

What are the differences between liberals and conservatives? What is a fascist or a socialist? What does it mean to be an environmentalist or a feminist? The course examines the meaning of these terms in light of their historical development. It focuses on the political theory behind each ideology and it also touches upon the relevance of political ideology to contemporary (largely Western) politics.

### **SOC 3104 MEDIA AND POLITICS**

What role has media played in politics and how has this changed? In the past forty years, the mass media has been transformed by new technology and by the corporations and governmental agencies that own and control it. Media and Politics examines the influence of corporate control on print and broadcast journalism, the role of advertising on the political process, and the significance of government regulation on the media. Students also briefly consider the rise of the Internet, the Web, the blogosphere and alternative media on democratic politics. Throughout, students discuss how media shapes public opinion. Most examples and readings come from North American media.

### **SOC 3105 CANADIAN STUDIES**

Students delve into what makes Canada Canadian through the investigation of a variety of perspectives, theories and academic disciplines. Rather than defining Canada as “not American,” this course seeks to look at what principles lie at the core of Canadian history, anthropology, politics and economics to link these to our culture, art and geography.

### **SOC 3106 PEACEBUILDING**

How do societies transition from war to peace? How does the international community help or hinder this process through a wide array of “interventions?” This course examines current practices in conflict resolution and peacebuilding around the world and situates these practices in the larger historical context of the past three decades. It explores the relationships between peacebuilding, democratic reform, justice and development, and invites students to engage with the moral and political complexities that come at war’s end.

### **SOC 3107 POLITICAL PSYCHOLOGY**

How does psychology play a role in political events such as elections, responses to natural disasters, or same-sex marriage? Political psychology is an interdisciplinary field that employs social and cognitive psychological theories to examine such issues in the world of politics. In this course, we explore how psychology can be used to understand and explain political leadership, movements and behaviour. Topics are discussed with political issues in context of framing, decision-making, values, stereotyping, nationalism and voting behaviour. The goals of this course are to introduce students to theoretical and empirical research in political psychology and to better understand the world of politics through psychological lenses.

### **SOC 3108 POLITICAL IDENTITY & CONFLICT**

Individuals identify themselves politically in a variety of ways—for instance, through gender, class, race and generation. In this course, we examine three specific means by which individuals believe themselves to be political actors—ethnicity, religion and nationalism. We ask a variety of questions here: What are the foundations of political identity?

How do people forge identities? What is the relationship between political identity and the state? How do culturally powerful minorities assimilate or resist assimilation in a nation? Are there economic and religious factors that cause identities to form? Can differences in identity lead to political conflict? When do they lead to political conflict, what kinds of conflict occur, and how are they negotiated peacefully? In answering these questions, we will examine cases from many different areas of the world. Students will also have the opportunity to choose projects consistent with their questions and representative of particular global issues.

### **SOC 3111 POLITICAL ECOLOGY**

Political ecology is an interdisciplinary framework that examines the complex intersections of political, economic, and socio-cultural dynamics of environmental phenomena. This course will blend foundational insights from human geography, cultural anthropology, sociology and cultural ecology to problematize human-environment interactions through a consideration of Marxian political economy and critical engagements with history, multi-scalar power relationships, socio-cultural dynamics and human agency. Employing this multi-disciplinary lens, we will examine a diverse set of phenomena, including the discursive (re)presentations of nature and science, struggles over land rights, vulnerability, conservation, the neoliberal governance of nature, environmental NGO movements, and land-based development.

### **SOC 3112 CANADIAN POLITICAL STRATEGY**

Prerequisites: Democracy and Justice (SOC 2200) OR Comparative Political Institutions (SOC 3101) OR Canadian Studies (SOC 3105) OR Course Tutor permission.

How do you win elections in Canada? What are candidates, or their parties, trying to accomplish through signs, door-to-door visits, advertising and debates, and how do they decide what to do with these tools of the trade? How do political parties play the ground game on election day, and how do politicians – and the public – try to shape political outcomes outside of elections? Drawing on scholarly research into the paradoxes of political campaigns, the effects of voter mobilization techniques, and the institutional parameters of Canadian politics, this course immerses students in a real Canadian electoral campaign to experience first-hand how such campaigns are fought: one vote at a time.

### **SOC 3113 TOPICS IN SECURITY STUDIES**

“Security.” Be it of nations, humans, or states, security is a concept that gives rise to an expanding range of government activities across the world. Almost two trillion US dollars are spent on military forces annually, nuclear arsenals are built and maintained, infrastructures of espionage and surveillance are constructed, and rights are curtailed or ignored in the name of “security” – and there are demonstrable threats to security, however defined: Terrorism, war, pandemic disease, and even climate change. There is also ample room to be critical of security as a rhetorical device to closedown political debate, however, and of the power structures that are created and perpetuated by doing so. This course explores selected topics in security studies in depth; topics may include terrorism and counterterrorism; intelligence and surveillance; the paradox of Weapons of Mass Destruction; or the study of classic works in strategic thought.

## **SOC 3114 GOVERNMENT IN CANADA**

This course examines the many facets of government in Canada. Themes discussed include Responsible Government and its conventions, the constitution and the Charter, cabinet government and the power of the Prime Minister, political parties, the electoral system, the senate, provincial and municipal jurisdiction, and civil society actors. Students will draw on material from both textbook readings and the broader scholarly literature on Canadian politics to engage with topics through discussion, simulations and small group activities.

## **SOC 3117 INDIGENOUS GOVERNANCE**

This seminar will build knowledge of the foundational ideas of Indigenous governance as it relates to Indigenous nationhood, language and self-determination. Set in the contemporary intellectual and political landscape, the focus of the course will be on the Canadian and North American Indigenous contexts, drawing on some international examples. Students will explore concepts related to Indigeneity, colonization, self-determination, Indigenous nationhood and the role of colonial courts and law. The course will emphasize face-to-face discussion between students and Indigenous intellectuals, professionals, and local Indigenous leaders to engage students with real-world Indigenous theories and realities. Through selected readings of fundamental and influential texts, supplemented with idea provoking videos and field trips, students will deepen their understanding of Indigenous governance and self-determination.

## **SOC 3119 BUSINESS-GOVERNMENT RELATIONS**

Businesses are the major drivers of economic activity in a capitalist state. Their actions have a myriad of impacts on society, both good (e.g. jobs and income) and bad (e.g. environmental degradation). Governments seek to control these activities through multiple means, including education, subsidies, voluntary agreements, market-based mechanisms and traditional forms of legislative-based regulation. Firms, whether large or small, respond by attempting to influence government actions and create circumstances conducive to their success. Businesses, after all, are also reliant on governments for many of the public goods they require to operate: roads, ports, security and a strong judicial system, for example. This course examines the complex relationship between these two types of institutions. Themes include: government policy instruments, institutional frameworks and their effect, business preferences for policy outcomes, lobbying strategies, corporate political action, corporate power, business associations, and small business action. Readings draw on scholarly work from multiple disciplines including Management, Economics and Political Science.

## **SOC 3201 COMMUNITIES AND CONSERVATION**

Using case studies from around the world, this course examines the assumptions and implications of community-based natural resource management. We consider questions such as: What is a community? In what ecological, economic, political or social contexts will communities better manage natural resources compared to centralized governments? Do democratic, multi-stakeholder approaches lead to better resource management? What are the interactions between gender and conservation? Topics include environmental justice, ownership rights, integrated conservation and development projects, equality and power, ecotourism, and multi-stakeholder management.

## **SOC 3203 THE FOOD SYSTEM AND ITS DISCONTENTS**

*Prerequisites: Must have completed three Social Science Foundation courses*

For Canadians, our contemporary food system is a marvel of efficiency, safety, sustainability, accessibility and standardization. Or is it? And, at what cost? This course takes a multidisciplinary approach to food studies, using critical, historical and geographical lenses to explore nuanced perspectives in four stages: 1) appreciating the development of the modern food system, its advancements and achievements; 2) surveying the many criticisms of this system; 3) identifying food initiatives and movements that are embraced as alternatives to the conventional system; and 4) critiquing these alternatives, with particular attention to class, gender and race.

\*NB: Student will need to spend up to \$20 on food supplies for this course.

## **SOC 3206 FOOD IN/SECURITY**

*Prerequisites: Must have completed three Social Science Foundation courses,*

This course offers students with interests in food, poverty, inequality, and/or social injustice an in-depth survey of food insecurity in a North American context. The course is built to facilitate a review of several profound questions of our time: Why are people poor? What is it like to be poor in North America? How do people cope with poverty and food insecurity? And, what are the physical and mental health consequences of food insecurity? Additionally, students will read seminal texts to critically evaluate proposed solutions to food insecurity, including food banks, school meal programs, nutrition education for the poor, and government policies. Students will research and write a review paper that examines food insecurity for a specific population or demographic, and they will design and execute a personalized food insecurity challenge, the results of which they will present to the Quest community.

\*NB: Students will need to spend \$50 on food supplies for this course.

## **SOC 3207 DOING IT FOR FREE: THE VOLUNTARY SECTOR**

*Prerequisites: Successful completion of chosen foundation-level social science courses.*

North Americans alone donate millions of hours of their time and millions of dollars to charitable endeavours each year in the pursuit of a more just society and an improved human condition. Quest University students are no exception in their enthusiastic engagement in voluntary activities to create positive change, contribute to their community and undertake learning. But is everything rosy in this domain of human organization and activity? This course gives students a concentrated opportunity to analyze key questions and contradictions inherent to the voluntary sector. Drawing on theories and insights from policy studies, political philosophy and human geography, we will investigate the possibility that the voluntary sector is simultaneously a tool of neoliberalization and a sphere of resistance to it. We will ask investigative questions such as: What is the ideal function of the voluntary sector in society? Why do people volunteer, and what are some important trends in this sector in North America? What are the implications of the growing trend of "voluntourism?"

## **SOC 3208 THE SOCIOLOGY OF SKIING: POWER, CULTURE AND NATURE IN THE MOUNTAINS OF BC**

*Note: Additional Fees TBD*

Why do we ski? Who participates in this sport and why? How do skiing and the areas where it occurs fit into larger societal power structures, inequalities, and patterns of global capitalism? How are these complex dynamics influenced by the winter hazards and environments where many go in search of untracked snow? This course will integrate classroom-based examinations of the often overlooked dynamics that underpin this leisure pastime and backcountry skiing-related experiences to explore our understandings of who chooses to participate in these activities, how we can explain those seemingly personal choices within a greater field of social forces, institutions and representations, and how we can interrogate our own understandings and embodied experiences in the backcountry through the explanatory frameworks of the sociology of sport and political ecology. There will be an additional course fee for this class. All participants must be intermediate-advanced skiers and can expect a skills prerequisite to ensure this level of ability.

## **SOC 3303 COMPARATIVE COGNITION**

One of the best means by which we understand how human minds work is by looking at the minds of other species. In this class, we'll investigate the cognition of animals other than ourselves. Such animals include non-human primates like chimpanzees and capuchin monkeys, dogs and wolves, elephants and rodents. Specifically, our class will try to understand to what degree other animals use social knowledge, communication, theory of mind, numerosity and spatial understanding to solve problems in their environments. This course provides students with knowledge about how other minds are similar and different from their own.

## **SOC 3304 COGNITIVE DEVELOPMENT**

This is the study of systemic psychological changes that occur over developmental time. The study of developmental psychology is based on six recurring themes of change. These are: 1) the relative contributions of nature and nurture, 2) the relative activity or passivity with which individuals engage in development, 3) whether development is continuous or in stages, 4) the mechanisms of change – what drives development, 5) the social context in which development occurs, and 6) the differences among individual developmental trajectories. These themes recur during the course as students investigate physical development, conceptual development, language development, intelligence and academic changes, social and emotional development, and moral and gender development. Through students' investigation of how children change over time, they are better able to make decisions as parents, teachers, and society as a whole, to benefit children and raise them more effectively.

## **SOC 3306 SOCIAL PSYCHOLOGY**

One of the distinguishing factors of the primate order is our sociability. This course investigates the social nature of humans and the ways that humans influence one another. During this Block, students look at the "basics" of social psychology: aggression, altruism, attitudes, conformity, obedience and social biases. Beyond these topics, students look at some of the innovative new pairings between other areas of psychology and social psychology. For example, the course focuses on the role of cognition in social psychology, as well as the use of some methods typical to cognitive psychology that have migrated into social psychology. Students also investigate the ways that social psychology has spilled over into other fields like business, education, law and sports teams over the years.

## **SOC 3307 EVOLUTIONARY PSYCHOLOGY**

This field potentially provides a unifying theory of psychology. To do so, students must confront one of the areas that humans most dislike to investigate—the beastly side to our natures. Students look at our most intimate moments through a lens of selfish genes. The course begins with a brief introduction to the important theories in psychology and evolutionary biology. The course then considers substantive topics that can be addressed through the lens of evolutionary psychology, namely: mating strategies (long and short term), sexual jealousy, cheater detection, sexuality, kinship, cooperation, pregnancy, sickness, parenting, spatial memory, landscape preferences, and aggression and violence. As an emerging field, evolutionary psychology addresses new ways to study areas typically found in cognitive psychology, social psychology, developmental psychology and linguistics.

## **SOC 3309 JUDGMENT AND DECISION MAKING**

By the time you leave your house in the morning, you have made dozens of decisions. Is deciding what to wear for the day subject to the same decision-making process as what career to pursue? The science of judgment and decision making examines this question and attempts to understand the fallacies we fall into and how we deviate from the "optimal" decision making process. In this course, we will integrate research from social psychology, cognitive science, and neuroscience to investigate what factors influence a decision.

## **SOC 3314 COGNITIVE PSYCHOLOGY: HUMAN MEMORY**

In this class, we will survey research and theory in cognitive psychology through the lens of memory topics. We will explore how human memory works and then explore research on memory in eyewitness contexts (e.g., false memories, lineup identification tasks, police interviews, etc.). These eyewitness situations are representative of a wide range of everyday memory issues. To facilitate learning, this class will be very interactive and experiential.

## **SOC 3317 RESEARCH METHODS IN PSYCHOLOGY**

In this course on research methods in psychology, you will learn about scientific tools to become an effective critical consumer of research. There's lots of good psychological science out there. But there's also misuse of good science, some bad science, and over-reliance on non-science out there, as well. The point of this class is to help you become a critical consumer who can spot good versus bad science and evaluate the validity of different scientific claims that you might encounter in the media, in casual conversation, or in a psychology research article or textbook.

## **SOC 3318 PSYCHOLOGY OF PERSONALITY - KNOWING A PERSON**

How can we know a person? In this course, we will explore this question from many perspectives, as we discuss personality traits; biological, unconscious, social, cognitive, and motivational factors influencing human behaviour; and the impact of individuals' life narratives. We will apply course topics to better understand others and ourselves and, with greater insight, discuss how to better promote human flourishing.

### **SOC 3319 PSYCHOLOGY AND LAW**

This is a course that aims to provide you with information on the application of psychology, both as a science and profession, to legal settings. Some of the topics we will cover include eyewitness testimony, forensic assessment, law enforcement psychology, psychological theories of criminal behaviour, and the roles and responsibilities of forensic psychologists will be covered.

### **SOC 3401 ANTHROPOLOGY**

Anthropology is the study of culture and the human condition, past, present and future. This course generally examines the four sub-fields of anthropology: physical (the study of human genetic and cultural evolution and diversity), archaeology (the study of past human material culture), linguistics (the study of human language, communication, and writing systems), and cultural (the study of human society and culture). More attention is focused on cultural anthropology, including exploring human social evolution, and modern human diversity. Students are introduced to the development of human societies, both traditional and modern. Through inspection of different cultural forms and encounters, the course also examines how the self (whether a racial, ethnic, gender, national, or class identity) is forged in relation to the other (images and views of cultural difference).

### **SOC 3404 COMPARATIVE RACE & ETHNICITY IN A GLOBAL CONTEXT**

This course serves as a critical introduction to the understandings (both theoretical and embodied), manifestations, and consequences of race and ethnicity in diverse international settings. What is race? What is ethnicity? How do these ideas function in material and discursive contexts? What are the (dis)similarities of the phenomena of race and ethnicity across the globe? How do race and ethnicity impact our own identities and experiences? By critically examining the social constructions of race and ethnicity in countries including Canada, South Africa, the United States, Brazil, and parts of western Europe, students will gain a deeper insight into the intrapersonal, interpersonal, and institutional dimensions of one of the most profoundly consequential ideological social constructions of modernity.

### **SOC 3405 GENDER AND POLITICS**

The personal is (still) political. This course critically examines politics at many levels—from deep power relations to highly visible institutions—through the lens of gender. At the same time, it explores the political implications of social constructions of gender. Feminist and queer perspectives in political theory, comparative politics, and international relations will be brought to bear to understand and undermine structures of gender discrimination in society.

### **SOC 3407 PSYCHOLOGY OF GENDER**

In this course, we will explore the psychology of gender beginning with asking: What is gender? How does our gender identity develop and how does it contribute to our sense of self? What are the psychological differences among genders (e.g., in cognitive abilities, emotional expression, sexual and romantic preferences, career choices, health)? How do they arise (developmentally and evolutionarily; culturally and biologically)? And, do any differences matter? While there are many interesting and valid approaches to the study of gender, this course will focus, but not exclusively so, on the psychological similarities and differences between men and women as evidenced by the scientific literature.

### **SOC 3408 ETHNOGRAPHY: LIVING AND WRITING THE DISTANT AND NEAR**

"When words gather together with energy, other places, other people, and other voices stir in a parallel life." So anthropologist and novelist Kirin Narayan begins her superb book, *Alive in the Writing: Crafting Ethnography in the Company of Chekov* (2012), that will serve as an entry into this course's objectives to get us thinking AND writing about how anthropologists and other social scientists struggle (sometimes with great success) to represent the human condition in all its myriad manifestations. Pivoting around Narayan's book, this course will not only explore key genres and eras (and errors) in ethnographic writing—from those well-known in the canon such as Clifford Geertz, to those on the horizon like Yarimar Bonilla—it will also challenge students to engage in the craft through writing experiments (both as laid out by Narayan and what we come up together in class) and reflections upon those experiments. The end goal is to come away with a profound grasp on the complexities involved in writing about the distant and near—those "other places, other people" Narayan evokes—and to see how our voices, "gathered together with energy...stir in a parallel life" with them.

### **SOC 3409 URBAN FORM, URBAN LIFE**

*Prerequisites: Must have completed three Social Science Foundation courses*

This course is an advanced survey of contemporary urban studies with a focus on Canadian and American cities. Important areas of focus consist of "I"s: urban innovation, urban identity, and urban inequality. We will read extensively from sub-fields such as urban-economic geography, urban planning, urban sociology and political studies. Using a political economy framework that understands urban change (for better or worse) as a function of prevailing economic conditions, this course will help students to work through important questions such as: How is globalization changing the economic dynamic of North American cities? Why do cities founded in different eras look the way they do? Why does gentrification happen? How do people interact in cities? How do university graduates and other talented workers make decisions about where to live? What is a "good city"? Students will also build their practical skills in delivering oral presentations, researching and writing, working in teams, and critical evaluation.

### **SOC 3410 A PARADOX OF SENTIENCE: HUMAN-ANIMAL RELATIONSHIPS IN THE ANTHROPOCENE**

It is nothing short of paradoxical that the rise of industrialization, roughly around the early 19th century, coincided with the birth of animal rights consciousness. This time period (which extends to the present) now has a specific name, the "Anthropocene," and it is the goal of this course to see how the Anthropocene helps implicate human treatment of nonhuman life: how humane have *Homo sapiens* been to other species, and how humanocentric do we continue to be? Though the idea of animal rights emerged out of concern for specific kinds of animals—largely domesticated ones whose value waffled between commodity and companion, such as cows, horses and dogs—it now circulates in conversations and concerns for all nonhuman "animal" life imperiled by human activity: from mountain gorillas in the Democratic Republic of Congo, to herring spawns in Bella Bella, British Columbia. However, these dueling concepts of Anthropocene and animal rights are not without imperialist and ethnocentric assumptions, and it is a further goal of this course to interrogate such concepts that attempt generalization and universalization when it comes to reckoning (and perhaps reconciling) the human / nonhuman divide over the past 200-plus years. The point to this interrogation is, in the words of Donna Haraway, a feminist historian of science, "to become worldly and respond."

### **SOC 3412** **CRITICAL DIALOGUES ON RACE AND GEOGRAPHY**

This course offers a critical introduction to the history of modern racial thinking in Western society, with particular emphasis on Canada and the United States. Our examinations are organized around themes of power and resistance with respect to formations of slavery and colonialism. We will explore these themes as they have been taken up by scholars and activist academics in the overlapping fields of Black (or African American or African Diaspora) Studies, Native (or Indigenous or First Nations) Studies and Geography.

### **SOC 3413** **GEOGRAPHIES OF WHITENESS**

This course explores whiteness as an object of scholarly inquiry within the humanistic social sciences. The exploration is organized around themes of power, privilege, and race. We will examine these themes as they have been taken up by scholars in the fields of Black (or African American or African Diaspora) Studies, Native (or Indigenous or First Nations) Studies, Human Geography and Critical Ethnic Studies.

### **SOC 3501** **RESEARCH METHODS IN THE SOCIAL SCIENCES: QUANTITATIVE**

Social sciences are set apart from the humanities and the life sciences by our ability to tackle human issues using scientific methods. Whereas a biologist might study bacteria using scientific methods, and a philosopher might use introspection to investigate the human condition, social scientists use scientific methods to understand the human world. In this class, students learn how to think like a social scientist. Students learn quantitative research methods, how to design elegant experiments, carry them out through data collection, analyse this data and present their results.

### **SOC 3503** **RESEARCH METHODS IN THE SOCIAL SCIENCES: QUALITATIVE**

Social sciences are set apart from the humanities and the life sciences by our ability to tackle human issues using scientific methods. Whereas a biologist might study bacteria using scientific methods, and a philosopher might use introspection to investigate the human condition, social scientists use scientific methods to understand the human world. In this class, students learn how to think like a social scientist. Students learn qualitative research methods, like ethnography, focus groups, interviews and surveys.

### **SOC 3602** **POLITICS OF CYBERSPACE**

More and more of our lives take place in the virtual world of cyberspace, but what is "cyberspace?" What does power look like in cyberspace, and who wields it? How are governments, corporations and individuals vying to shape the future of cyberspace, and how is the emergence of cyberspace transforming traditional politics? From hacktivism and slacktivism, to debates over censorship and regulation, to concerns about privacy and surveillance, to the strange worlds of cyber security and cyberwarfare, this course will give students the tools to explore, debate, and analyze this rapidly-evolving landscape. (NOTE: No technical knowledge of computers or networking is required for this course.)

### **SOC 3701** **LANGUAGE, CULTURE, AND THINKING**

Is language unique to humans? How is gesturing different from sign language? What does it mean to be multilingual? Language is fundamental to human behaviour and underpins all forms of knowledge transmission. With roughly 6,500 languages in the world, humans

continually shape and are shaped by language. This course examines how humans use language from telling lies to inventing Netspeak, from translations to language disorders. Through investigating the relationship between language and thinking, we can develop a better understanding of how we behave, interact with others, and relate to the world around us.

### **SOC 3702** **CHILD LANGUAGE**

How do children learn language? Is language innate or learned? How does language development change when a child encounters more than one language? In this course, we will examine the linguistic path of a child from babbling to inventing imaginary worlds. In addition to first language acquisition, we will investigate the issues particular to children from homes where the language differs from that of the school. Approaches from psychology, linguistics, & education will be used to understand the roles that families, peers, and schools play in children's development of language.

### **SOC 3704** **MASCULINITIES**

Emerging out of the feminist theorizations of the later 20th century, theories and empirical studies of masculinity have recently established an important new critical lens through which to understand the experiences, actions, perceptions, and emotions of diverse boys and men. This course, which focuses on the North American context, explores various discursive constructions of masculinity, the ways in which boys and men experience and embody their masculinities, and the various means in which the gendered social order influences men's actions and understandings. We will employ an intersectional analysis to think about the ways that masculinities are influenced by race, sexuality, disability, body shape and class. Some of the topics we will cover are theories of and responses to hegemonic masculinity, male socialization and gayland culture, male sexualities, male body image, male aggression and violence, experiences of fatherhood, media representations of masculinity, the centrality of work and sport to understandings of masculinity, and the social construction of masculinities in different historical and cultural contexts. The course is interdisciplinary and will use feminist theory, social science research, popular texts, multimedia masculinities, art, and autobiography to aid our exploration.

### **SOC 3705** **HISTORY OF EDUCATION: INTERGENERATIONAL CULTURAL TRANSMISSION ACROSS TIME**

This is an interdisciplinary course on the history of education and intergenerational cultural transmission. The course addresses that history through a cross-cultural exploration of the changing nature of childhood and adulthood and evolving approaches to preparation for adult roles in different contexts. It addresses both formal and informal education and approaches to intergenerational cultural transmission from what might be deemed an art historical perspective, interweaving social, political, economic, philosophical and cultural strands in a cross-cultural analysis drawing extensively on primary sources, both textual and iconographic.

Three themes are interwoven in the fabric of this course: the persistence of the past in the present, the roles that personal and collective historical "memories" of schools and schooling play in shaping engagement with educational processes, and the importance of a global historical perspective in exploring educational issues in BC and Canada today. A key focus of the course will be the impact of the invention of adolescence by such figures as G. Stanley Hall at the beginning of the 20th Century and the evolution of psychological and sociological "social imaginaries" embodied in schooling ever since. Students are invited to engage in a critical, dialogical approach to learning through close reading of primary sources, reflective exploration of the phenomenology of participants' lived experiences, and shared stories and conversations.



### **SOC 3706** **LANGUAGE IN SOCIETY - INTRODUCTION TO** **SOCIOLINGUISTICS**

Everyone uses some form of language, whether it is spoken, written, or signed. In this course, we will examine the relationships between language and society by drawing upon the theories and methodologies of sociolinguistics. This course explores the intersections of language with all aspects of our lives - from the individual choices we make to the larger effects of our social institutions. We will gain a basic understanding of the field of sociolinguistics and reflect on our own linguistic and cultural contexts and how they shape our language behaviour.

### **SOC 3707** **CHILD LANGUAGE ACQUISITION**

How do human beings acquire language? In this course, we will explore the many ways in which language acquisition occurs both in spoken and gestural forms. Drawing upon insights in a variety of disciplines (including sociolinguistics, psychology, and cultural anthropology), we will study the various developmental stages and what they mean for children of different abilities and linguistic backgrounds. Students will complete a final research project and we will learn analytical and observational skills using natural data recorded from real infants.







