UBC Vancouver Summer Program

July 15–August 15, 2017 Course Package Offerings

http://vancouversummerprogram.ubc.ca

Enhance your students' learning experiences with study in an international setting in Vancouver, BC Canada! We welcome each university to organize a group of students to study course packages in the beautiful campus of the University of British Columbia.

Many course packages have a minimum and maximum class size, so we encourage you to register your students early. Course packages that do not have the minimum number of students will not be offered, but students may transfer to other packages.

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Applied Science - Chemical Engineering

Harnessing Chemistry: An Introduction to Matter, Energy, and Chemical Engineering

Matter and energy are the building blocks of our universe. Using their understanding of these concepts, chemical engineers *re-organize* and *transform* matter and energy to produce new substances and materials. From the pharmaceuticals we take when we are sick, to the fuel we put in our cars, to the plastics, alloys and polymers that we find in our homes, in our phones and virtually everywhere around us, chemical engineers are involved, always keeping economic and environmental sustainability in mind. This course provides an introduction to the chemical engineering discipline, first by providing an overview of the physical processes and laws involved in the conversion of raw materials into refined products, and secondly by applying these concepts into more practical applications and designs. Students will have the opportunity to perform laboratory experiments illustrating some key concepts, as well as cap off the course and establish connections with newly acquired theory by visiting an operating industrial facility. No prior knowledge of chemical engineering is required to take this course.

Harnessing Nature: An Introduction to Biological Engineering

Science has advanced to a point at which humankind now asserts its dominion over the very building blocks of life, and engineers are at the forefront of the efforts to harness the power of biological systems and develop new technologies, materials, medical tools and treatments, foods, industrial products and environmental processes to improve the world around us. This course provides an introduction to biological engineering, covering subjects that include introductions to microbiology, cell biology, and genetic engineering, bioprocessing for the production of biofuels, foods and pharmaceuticals, biomaterials, and recent advances in tissue engineering. Parallels are also drawn between biological systems and the chemical systems discussed in Course I. The ethics and social aspects of bioengineering are also discussed. Participants will have the opportunity to apply theory into practice through lab experiments, and to witness bioprocessing and sustainable design in action with a visit through a tour

to a local biological waste treatment plant. No prior knowledge of biochemistry or biological engineering is required to take this course.

Applied Science - Civil Engineering

Civil Engineering Materials Package

Structural Materials

The structure and properties of common Materials used in civil engineering structures such as Portland cement Concrete, asphalt concrete, timber and steel will be studied. The emphasis is on the relationship between the production and structure of these materials and their mechanical properties and durability when used in structures. The course will include field visits to construction sites and presentations from industry personnel.

Laboratory Testing of Structural Materials

The course will focus on testing structural materials used in civil engineering structures such as Portland cement Concrete, asphalt concrete, timber and steel in the laboratory. Some topical problems will be identified in the performance of these structural materials and students in groups will carry out laboratory experiments to study the materials involved. This is a laboratory based course where site-visits and external consultations are an integral requirement.

Applied Science - Electrical and Computer Engineering

Applied Science ECE Package A - Renewable Energy and Power Conversion

Introduction to Renewable Energy Systems

Do you want to save the planet with green power? This course covers the fundamentals of renewable energy systems and includes topics on energy storage, power generation, distribution, transportation, and consumption. We will start with an introduction to carbon emissions, climate change, and environmental pollution to emphasize the importance of sustainability. Students will learn about solar, wind and ocean power generation. Grid connection and microgrids will be explained, as well as battery storage and fuel cell systems. Modern loads such as LED lights and electric vehicles will be discussed around the concept of demand side management. Students will gain skills on these emerging and keys areas of green power and will have the opportunity to consider several case studies/examples. The course includes some tutorials and demonstrations using simulation software and physical equipment. What could be more important? The global energy markets will be dominated by renewables in the future - the planet will depend on engineers with a strong background in green power.

Electricity and Conversion for Renewable Power

How do we make renewable power generation happen? Renewable energy sources such as wind, solar, and ocean are intermittent and fluctuating. Changes in sun irradiance during the day, in wind speed variation, and changing ocean tidal velocity produce fluctuations in power generation. This course covers the fundamental of electricity and power conversion to transform variable/fluctuating energy into high quality power required to supply loads. The principles of power conversion for AC and DC system will be covered. Application examples will include topics such as power converters for battery chargers, solar inverters, wind/ocean power conversion, and traction for electric vehicles. The course will provide a

strong theoretical background and enable students to understand renewable power conversion at the system level. A practical/applied component will be included, providing the student with real-world problem solving scenarios, laboratory experiences and visits to UBC state of the art power facilities.

Applied Science ECE Package B - Electrical and Computer Engineering

Communication Systems: Technology Embedded in Daily Life

Tweets, blogs, emails, videos, texts … we rely on a myriad of communication systems but how do these systems really work? This course will start off by exploring the key historic technology breakthroughs that have led to modern communication systems. This will be followed by an introduction to how information is represented and why the digital revolution is the underpinning of modern communication. The remainder of the course will analyze current communication systems, technologies and standards selected to give the students a comprehensive overview of what is on the market. Examples include the LTE wireless standard which is common in most cell phone networks, WiFi for local wireless communication, and modem technology which enables information to be transmitted and received over fiber optic cables, wires or air. Students will build their knowledge through case studies of current communication technologies and systems with an emphasis on understanding and relating performance specifications to the user experience.

Introduction to Digital Systems Design with FPGAs

Digital systems lie at the heart of almost any electronic system including wearable devices, cell-phones, signal processing systems, computers, biomedical devices, etc. In all of these systems, the "intelligence" of the system is implemented in digital logic. This course introduces digital systems, and how to design them. More specifically, you will learn about combinational and sequential logic, synchronous and asynchronous circuits, embedded processors, and other related topics. The course will have a significant laboratory component, where a digital hardware design language (VHDL) will be introduced and employed to bring to life your digital designs on an FPGA (field programmable gate-array) board.

Applied Science ECE Package C - Principles of the Modern Internet

The focus of the two courses will be on principles for modern Internet technologies. Prior programming experience (for example, with C/C++, Java, Python) and an ability to learn new languages will be assumed. In particular, students will be expected to complete a mini-project using JavaScript and related technologies that emulates a real-world application.

Algorithms and the World Wide Web

The Internet and the World Wide Web have enabled new methods for communicating and working with data. What is the underlying infrastructure for the Internet? What are the algorithms used to move bits of data around? How is your credit card number kept secure when you buy a book from Amazon or Baidu? How is your location determined using GPS when you play Pokémon Go? How do some dating web sites match people? We will discuss some of the system building and algorithmics that power the World Wide Web.

Building Modern Web Applications

Do you want to develop your own web-based application? Have you dreamed of making quick and slick looking web applications that are also robust? We will discuss the central abstractions and principles that enable the development of robust web applications. These principles can be applied when building applications using technologies such as HTML, CSS, and JavaScript.

Architecture and Landscape Architecture

Architecture Package A – Thinking by Design

Design thinking and strategic design

This course introduces students to key concepts, methods and tools of design thinking and strategic design. Part creative ideation, part critical analysis, and part innovative thinking, students learn essential knowledge, skills and tools of strategic creative thinking applicable within many fields such as business, engineering, design and policy. Course format includes lectures, workshops and studio based activities that bridge theory and application.

Design thinking as a practice

This course teaches students to apply techniques of design thinking and strategic design to a real problem in a practical context. Students will learn to adapt creative techniques of problem definition, analysis, concept generation, visualization and presentation to the particular circumstances of a case study project.

Architecture Package B – Architecture in Wood

Wood as a building material

Vancouver has been a global centre of innovation for the cultivation, processing, engineering and manufacture of wood building materials and wood building design for over 100 years. In this course, students will learn how scientific, engineering and technical knowledge about wood informs creative processes and concepts of design with wood. Course format combines classroom based lectures, presentations and exercises with field visits to study contemporary places and techniques of wood production, processing and construction.

Case studies in building with wood

This field-based course connects creative and technical understandings of wood as a material from Course 1 to the design of innovative wood buildings and structures. Students will learn to document, analyze and illustrate the integration of design and technical concepts within a contemporary wood building. Course format combines classroom based lectures, presentations and lab demonstrations with field visits to innovative buildings and design and engineering firms.

Architecture Package C – Urban Design

Sustainability by design

This class introduces the basic principles of sustainable urban design with tours of internationally significant local examples. Relevance of these examples to global development is isolated and discussed. A typical day includes a lecture focusing on one principle of sustainable city design, followed by a tour

of a place in the region where this principle is obvious. Students will see and experience examples of significant contemporary urban design practice in suburban, urban, and downtown contexts.

Perspectives on city making

This class uses the development of the City of Vancouver to illustrate how many social, political, economic, creative and natural forces combine and interact to make a city. Students learn and experience these forces through the eyes of those who were a part of it. There will be tours and special presentations from those who played a role in specific development projects. Students will gain an insight into both the practical and theoretical considerations that have led to the city as we know it.

Arts

Arts Package A – The World of Manga and Anime: From Writing to Theory

This package brings together leading expertise from two of the most well- established academic units in the Faculty of Arts: Asian Studies and Creative Writing, offering a unique and hands on educational experience. UBC's Creative Writing is one of Canada's oldest and most respected creative writing programs.

Manga and Anime in the World

This course explores two of Japan's most important export media, including the way those media circulate in East Asia and around the world. Study the structural and cultural aspects of Japanese manga and anime, and their relationship to similar media such as Korean manhwa and Chinese manhua. The writing skills that students learn in the Writing for Graphic Forms course will also be used in this course to foster understanding of manga and anime's unique message delivery systems, in order to study the ways these "soft power" forms are transforming international relations.

Writing for Graphic Forms: Manga

This course will explore the practical techniques of creating, developing, and writing for graphic forms with particular emphasis on Japanese manga. The contemporary manga is the result of a creative interaction between Eastern and Western traditions of story telling, so students will study the Western three-act structure and then consider ways in which manga can assimilate, adapt, or differ from that approach. Students will develop a script and then, through the use of story boards, consider panel construction, focusing on the conventions of the genre. While there will be substantial drawing in this class to demonstrate character creation, character arcs, world building, and plot structure, the ability of a student to draw well is not critical. Stick-figures are sufficient as long as a student is willing to explore his/her creativity in graphic novel, manga, and other forms of illustrated writing.

Arts Package B – Global Journalism, Culture and Communications: Practice and Principles

This package examines the ways in which media shape, and are shaped by, society and technology. Students will learn about the social and cultural context of communications, become familiar with

current debates in media and be introduced to journalistic principles and practices. The package brings together the Department of Anthropology and the award-winning UBC Graduate School of Journalism.

Culture and Communication

Anthropology is the study of human societies and cultures and their development. A very important area of interest is human language. This course will examine the relationship between language and culture by covering key debates in the field including animal vs. human communication, cross-cultural differences, language policies and language change. Students will explore how language is involved in cultural constructions of race, gender, class and ethnicity. They will also analyze how language is understood in relation to power, political economy and language ideologies. Students will gain experience in meeting writing standards for UBC Arts/Anthropology courses and will receive individual feedback on writing assignments.

Global Journalism

This course will examine the development of media technologies, their applications, and their cultural, political and social impacts. Students will also gain hands-on experience in learning how to think and operate like a professional journalist in a simulated multimedia environment. It is designed to introduce students to the grammar and syntax of media across platforms, based on a core journalistic skill set of interviewing, reporting, news writing, and research methods in tandem with the most current technical tools.

Arts Package C – The English Language in a Globalized World

Students will gain a deep perspective on the internal structure, origins, and many variations of the English language. These courses are modeled after university-level courses for native English-speaking students, and are jointly offered by UBC's globally recognized Departments of Linguistics and English.

The History and Future of the English Language

In order to contextualize present-day changes in English, the course will begin with a brief history of the English language. It will then examine issues such as the national dialects of English (e.g. Canadian English, British English, Singapore English), regional and social dialects, the effects of gender on language forms and use, language in computer-mediated discourse (in texts, emails, social media), and ongoing changes in contemporary English. The course will provide students with a better understanding of how English is used in different contexts, and the directions in which the language is heading in the 21st century.

How Human Language Works

An introduction to how human languages work, examining the structures that underlie all languages, with special focus on the deep structure of English. The course asks what universal properties are shared by all languages, and how languages as divergent as English and Chinese can be different (or similar!) in terms of their sound systems, word-building, grammar, meaning, written form, and acquisition by children and adult learners. By the end of the course, students from varied language backgrounds should

understand how knowledge of the universal properties of languages can deepen their understanding of English, of their own language(s), and of the amazing capacity of the human mind.

Arts Package D – International Finance, Trade, and Politics

This package combines the Vancouver School of Economics (VSE), a global centre for research and hands-on learning about pressing economic issues, ranked in the top 20 worldwide and number one in Canada, and UBC's highly regarded Political Science Department. The only two British Columbians to become Prime Minister of Canada – John Turner and Kim Campbell – graduated from this department.

International Trade and Financial Markets

The modern global economy is intricately tied together through networks of trade and financial interconnections. This course will give students an understanding of the structure and function of international trade and international financial markets. The course will give a basic introduction to the forces driving international trade in goods and financial assets among nations of the world. The major theories of international trade and financial markets will be reviewed. Topics covered will include the determinants of a country's trading pattern, recent trends in international trade such as offshoring and global supply chains, the role of financial markets in international development, the future of the Renminbi as an international currency, the understanding of international financial crises, and sovereign debt crises.

Dynamics of Democracy and Global Uprisings

This course deals with some of the key concepts of political science, matching them with developments around the globe. We begin by considering some of the concepts and controversies in defining democratic and non-democratic systems. How do we tell democratic systems from non-democratic ones? Are all democracies the same, or at least similar? Is citizen satisfaction a distinctive quality of those regimes? We then link these discussions to the rising waves of global discontent around the globe. The seemingly-universal quality of these uprisings give a strong indication that the struggles we are witnessing are no longer over democracy versus other systems; instead, what seems to be at issue are the meanings and practices largely associated with democratic regimes, the expectations of people, and what regimes provide. Finally, we focus on specific uprisings, chosen by the students, in an attempt to contextualize our discussions and make sense of recent global developments in an informed, thoughtful manner.

Arts Package E – Environmental Economics and Geographies of the Global Economy

This package pairs the Vancouver School of Economics (VSE), a global centre ranked in the top 20 of its peer departments worldwide, and number one in Canada, with the Geography Department, ranked as one of the ten best geography programs in the world and best in Canada, according to the 2016 QS University Rankings.

Geographies of the Global Economy

This course will explore the fast-changing geographies of the global economy from the uniquely grounded perspective of economic geography. The course will examine a range of contemporary issues and debates in the field, including: the development of transnational production and logistics networks: changing patterns of migration and labour mobility; the growth and influence of world cities and financial centres; new models of economic growth and varieties of capitalism; and contrasting perspectives on economic and cultural globalization. Students will acquire an up-to-date understanding of the changing global economy and its principal challenges and opportunities, together with an understanding of their own place in the world.

Environmental Economics

This course provides an introduction to economic aspects of environmental problems and sustainability. It will begin with an overview of selected environmental problems, such as the effects of air and water pollution on human health, threats to biodiversity from habitat destruction, and climate change. Trends and indicators of environmental sustainability, both within and across countries, will be reviewed. The course will focus on questions such as why environmental problems occur, whether or not globalization is increasing the severity of such problems, what types of policies have been successful in improving environmental quality, and whether or not current consumption levels are sustainable. Policies will be analyzed from the perspective of efficiency, effectiveness, political feasibility and fairness, and examples will be drawn from different countries.

Arts Package F – Asia in the World: (Cancelled)

Arts Package G – Computational Linguistics: From Search Engines to Social Media

Language and computation are the very foundations of the new knowledge economy. In this package, students will explore these foundations through the dynamic field of Computational Linguistics. Students will examine how linguistics and computation combine to answer fundamental questions about language, and study the ways in which it is deployed by the tech industry to provide solutions to some of today's most pressing issues. A background in computing is not necessary.

Linguistics for Natural Language Processing

An introduction to the general linguistic principles and concepts that are relevant for computational linguistics, including: (i) an introduction to phonetics and phonology, (ii) an understanding of syntactic and morphological structure, (ii) descriptive approaches to grammar, (iii) language typology and linguistic universals, including differences and commonalities between different languages, cultures and modes of communication. In each case special reference will be made to computational applications, and by the end of the course students should understand how knowledge of the universal properties of languages both contributes to and benefits from computational research and applications.

Computation for Natural Language Processing

This course will take students with little or no background in computing and teach them programming basics and the practical uses of computational linguistics and machine learning. Students will learn how to use a command line interface and create simple programs using Python and NLTK. The course will

then take them step-by-step through how programs perform such tasks as tagging speech and analyzing sentence structure or meaning. They will see how these steps can be applied in such useful and ubiquitous applications as error correction, spam filters and author identification among others. Finally, they will see concrete examples of how computation is contributing back to traditional areas of linguistic enquiry.

Arts Package H – From Stage To Screen: How Vancouver 'plays' to a Global Audience.

This package examines the ways in which film and theatre are shaped by the city in which they are produced. Students will learn about the thriving theatrical city that is Vancouver and use simple film techniques to document how place can influence both live and digital work. The package brings together the most dynamic aspects of the Department of Theatre and Film, which produces exhilarating live theatre and films, while examining the academic endeavours of both.

From Drama to Theatre: How Does a Play Mean?

This course will explore the languages of theatre within Vancouver's rich and lively performance culture. How do individual artists—directors, actors, designers—transform a playwright's ideas into unique and original art? In what ways, for example, will a Shakespeare play produced in Vancouver become a Canadian play? These questions and more will be explored in relation to two plays a week in production in Vancouver during the term. We will examine and discuss the play scripts, attend the plays, and meet "backstage" with some of the artists themselves. Plays chosen will span a variety of genres, including Shakespeare (in production at Bard on the Beach Shakespeare Festival), musicals (in production at Theatre Under the Stars and the Arts Club Theatre Company), plus additional dramas and comedies in production.

Documentary & the City

For the first time in human history a majority of the world live in cities. While there are multiple threats posed by the growth of cities, such as poverty, migration, and social divisions, there are also surprising and innovative practices that emerge. The city of Vancouver is brimming with stories that can tell us many things about the world we live in. Focusing on documentary films and filmmaking, this course introduces students to these often hidden stories of the city through key writings, films, and direct engagement with life in Vancouver. Students will use creative methods to connect critical analysis with their everyday experiences, while authoring basic documentary projects in neighbourhoods throughout the city.

Business

Business Package A – International Business Management and International Marketing

International Business Management

Development of general environmental framework for international business studies by drawing on international and development economics, research into government-business relations and studies in comparative socio-cultural systems and political systems. This course is taught from the perspective of a senior manager. It analyzes the decisions made by firms in an international context. To do so it combines material from strategy, international finance, marketing, human resource management,

positive trade theory, institutional trade policy, and other areas. It will emphasize the use of analytical tools and the development of oral and written communication skills. By design, the course in integrative, implying that there is some overlap with material taught in international marketing and finance courses.

International Marketing

An analysis of the scope and significance of contemporary international business operations with particular reference to the marketing management problems encountered by firms with multinational branches and subsidiaries. Through lecture material and practical assignments, students will explore a broad range of international marketing issues and concepts. With a focus on strategic problem solving, you will learn the use primary and secondary research tools in objectively evaluating international market potential and risk. The marketing process is examined in detail, including strategic market planning, product, pricing and promotional decision-making, and marketing management. The course is taught with a hands-on approach and providing you with abundant time to employ knowledge learned to advance your term project.

Business Package B – Introduction to Marketing and Management and Organizational Behaviour

Introduction to Marketing

This course is designed to provide a broad introduction to the field of marketing and basic considerations affecting the domestic and international marketing of goods and services. Marketing is far more than just selling or advertising within a business setting; it is a major part of everyday life. This course will illustrate the importance of marketing and will help you develop fundamental marketing knowledge and skills applicable to all specializations within business.

Management and Organizational Behaviour

The primary objective of this course is to teach you about the effects of organizational structures and interpersonal processes on the behaviour of individuals in organizations and the wider implications for the effectiveness and success of organizations. This course will expose you to frameworks, approaches and behaviours that can help in effectively participating, leading and managing in organizations. Research has shown that effective people management is an important contributor to organizational success. The emphasis will be on creating effective leaders and team members through a better understanding of motivation, working in teams, power and influence, leadership and navigating organizational culture and change. All this will help participants contribute to the success of themselves and their organizations.

Business Package C - Strategic Management and New Enterprise Development

Strategic Management

Concepts and processes for the strategic management of private sector, single and multi-business unit enterprises are analyzed using the case method. Methodologies which draw on economic and organizational theory are integrated to form the foundations for strategic analyses. This course builds students' ability to analyze and develop business strategies by introducing frameworks and tools to understand the nature of competition in general and to analyze the specific competitive position and strategic options of a given firm. You will learn frameworks for analyzing industry structure, internal

capabilities, and competitive interaction, as well as how to use those frameworks to critique a specific firm's competitive position and develop and evaluate strategic alternatives.

New Enterprise Development
This is an introductory course to the field of entrepreneurship. It is also useful to anyone who expects to be interacting with entrepreneurs in their business careers, be it as private investors, venture capitalists, consultants or customers. The course provides an experience-based exposure to the process of starting entrepreneurial ventures as well as examining the challenges facing any would-be entrepreneur in the real world. This includes developing business models and strategies for innovative products or services and strategies for acquiring resources, particularly financing.

Business Package D - Business Analytics and Supply Chain Management
Business Analytics
Business professionals in many functional areas, especially operations and marketing must have familiarity with and skills in each of descriptive, predictive and prescriptive analytics. Descriptive analytics includes data analysis and data visualization: understanding, manipulating, evaluating and presenting the many complex data and information streams that drive today's businesses and organizations. Predictive analytics includes forecasting, various statistical techniques, data mining, and machine learning; taking the analysis of the present to generate likely scenarios of the impact of doing things differently or of future trends. Prescriptive analytics involves the employment of a number of analytical models to aid decision making: examples include but not limited to would be optimization, Monte Carlo simulation, decision trees and discrete event simulation. The course will cover some of these topics and show how they are important in making business decisions.

Supply Chain Management
Supply chains consist of several decentralized firms that coordinate the flow of goods and information. In today's business environment, producers of goods and services often rely on a complicated network of firms to deliver their products and services to customers. The course will discuss and tackle significant issues that arise in managing modern supply chains. In this course we will discuss many of the strategic implications for the various firms involved in a supply chain. Such an analysis will involve putting together many different areas of business such as marketing, accounting, finance and human resource management. The course will expose students to decision making frameworks that look at issues on inventory and capacity management, reducing operational risk, location models, and the management of logistics in a supply chain.

Dentistry
Dental Caries and Oral Cancer Package
Oral Cancer: Why Haven't the Clinical Outcomes Improved?
Cancer of the oral tissues is the 6th most common type in the world. In some developing countries oral cancer is much more common due to oral habits and exposure to chemicals that can cause cancer. The five- year survival rates for oral cancer remain low with nearly half of all the affected individuals dying

from the disease. Early diagnosis of oral cancer is the most effective approach to decrease the mortality and morbidity. Pre-malignant lesions exist that have a much higher chance of becoming oral cancer and the recognition and management of these lesions can prevent cancer development. Oral cancer occurs in an anatomic location that is amenable to early diagnosis. Many techniques have been developed to aid in the recognition and diagnosis of both pre-malignant and malignant oral lesions. In this course the development of oral cancer, the clinical signs of the condition, the clinical and laboratory procedures for diagnosis and the long term consequences of an oral cancer diagnosis will be covered.

Dental Caries: The Most Common Infectious Disease in Humans

Dental caries affects more than 90% of all humans. The disease requires a combination of bacteria, a sugar and a susceptible mineralized tooth surface. The bacteria metabolize the sugar and a by-product is acid. The acid removes mineral from the surface of the tooth. Extensive destruction of the tooth mineral leads to the pathology, dental decay. Dental decay is a progressive process and if it is allowed to continue it can progress into the dental pulp and then into the supporting bones. If a bacterial abscess forms in the bone supporting the tooth it is often necessary to remove the tooth. Dental caries is the leading cause of tooth loss in the world. The loss of teeth affects the ability to eat, alters nutrition and has a dramatic impact on the quality of life. This course will take a comprehensive look at dental caries to understand how this disease impacts human populations.

Education

Education Package A: Teaching and Learning English

This package offers students a practical introduction to the theory and practice of teaching English. Both courses are designed for pre-service and in-service English teachers. Beginning with a close examination of English as a linguistic system, a means of communication, and a sociocultural practice, the package also considers a variety of approaches to the teaching of English, and provides a full range of teaching techniques and strategies.

Applied Linguistics for English Teachers

Successful language teachers need to understand more than just the structure and nature of the language(s) they teach: they also need to develop an understanding of the social, cultural, and ideological implications of language and language education. Language classrooms are diverse, multilingual, multicultural and multimodal places, presenting students and teachers with unique challenges. This course serves as a general introduction to theory and research concerning these issues as they relate to learning and teaching, from the perspective of applied linguistics. Topics to be discussed include: theories of first and second language learning; the relationship of theoretical issues in applied linguistics to educational practice; language variation; language attitudes and ideologies; world Englishes; language and globalization; language policy; language and gender; language and race, and more.

Introduction to Teaching and Learning English

This course provides a general theoretical overview of and some practical preparation for English language teaching (ELT). Its scope is diverse as it considers approaches to language teaching, a range of teaching techniques and strategies, learner needs, instructional contexts, assessment, and

sociocultural concerns, as they pertain to teaching English in a variety of contexts. The course examines ways to teach listening, speaking, reading, writing, grammar, and vocabulary but always with a view to integrating these skills. Students will have the opportunity to contribute to and learn from active engagement in discussions on contemporary ELT issues and topics.

Education Package B – Language in Canada and beyond

Canada is a country rich in languages. There are over 60 Indigenous languages, and the two languages of the original colonial settlers – English and French. And then there are the hundreds of languages brought to Canada by immigrants from around the world. The result is a multilingual, multicultural country that provides a perfect location for the study of English as a living, changing language. The courses in this package are designed to help students improve their own written and spoken English while they investigate the ways in which language works in different settings and across cultural spaces.

Language practices in Canada: A multilingual land

Successful language learners need to understand more than just the structure and nature of the language(s) they learn. Through in-class interactive sessions and field trips, this introductory course provides a broad and coherent overview of diverse language practices across multilingual contexts (such as Canada) and explores how this diversity impacts language learning and teaching. Students will have an opportunity to reflect on their own language choices in different contexts and develop critical thinking and collaborative work skills through class discussions and assignments. Topics to be discussed include: language variation according to age, ethnicity, class, race and gender; language variation in sports, entertainment, work, and the arts; language attitudes and ideologies. By the end of the course, students will be able to analyze functions of language in society and achieve a deeper understanding of how key course themes and concepts operate in language teaching and learning in multilingual contexts.

Language across borders and boundaries

Being able to communicate in multiple contexts and cultures is an important prerequisite for living and working in an increasingly globalized world. This course will provide students with an understanding of the diverse strategies of language use in and beyond the classroom. The course will help students to adapt their own language practices to a wide variety of social and cross-cultural settings and to analyze the language use of others. Diverse approaches to conceptualizing and analyzing language in use will be introduced. By the end of the course students, will be familiar with key sociolinguistic concepts, will have developed effective strategies for enhancing their language use in multiple settings, and be able to apply course content to helping others with their language use. Suitable for both students and teachers of English.

Education Package C – Classroom Management and Behavioural Assessment

Classroom Management

The course is designed to empower educators to develop a positive classroom climate and an effective learning environment in which teachers and their students engage in meaningful and successful learning experiences together. To achieve this goal, students will be introduced to current, evidence-based

practices in school-wide, classroom and individual behaviour support. Classes will include lecture, discussion and small group activities that provide opportunities to develop skills in the application of these practices. Specific objective of the course includes developing student knowledge and skill in: (a) a proactive, preventive approach to classroom management; (b) school-wide positive behaviour support; (c) the design of a positive classroom environment; (d) the development of positive, nurturing relationships with students; (e) the use of positive reinforcement to strengthen prosocial behaviour; and (f) effective ways to respond to problem behaviour.

Assessment and Positive Behaviour Support in School and Community Settings

The course introduces students to the philosophy and methods of behavioural assessment and positive behaviour support with persons who engage in challenging behaviour in school and community contexts. Specific objectives of the course include developing student knowledge and/or skill in: (a) basic principles of behaviour change; (b) the features and values of positive behaviour support; (c) ecological assessment of environments and functional assessment of persons with challenging behaviour; (d) the completion of summary hypothesis statements and competing behaviour pathway diagrams; (e) the design of multi-component behaviour support plans that are logically-linked to assessment results; and (f) the design of plans that are both technically sound and contextually-appropriate.

Education Package D - Current Trends in North American Art Education

These courses are designed to introduce international students to research, theory, and practice pertaining to two significant and current trends in K-12 Art Education in North America: (i) contemporary art as a pedagogical and educational practice and (b) digital visual culture art education. International students will be provided with opportunities to learn how research and theory is connected to practice by engaging in field study and project based learning including engagement with educators and curators at significant cultural institutions in Vancouver such as The Vancouver Art Gallery, Vancouver Contemporary Art Gallery, The Morris and Helen Belkin Art Gallery, and the Museum of Anthropology at UBC.

Pedagogical Possibilities of Contemporary Art Practice

This course will focus on contemporary art's pedagogical and educational potential. During this course students will consider the theoretical and practice-based work emerging from the recent turn to education in contemporary art and curatorial practice, and they will study the implications of such work for K-12 art teaching and learning. Working with museum exhibitions and collections in Vancouver, students will investigate how contemporary artworks reveal aspects of the world to us and encourage us to view life from other perspectives; thereby extending and enlarging our understanding of the world and its operations. During this course, students will also study how the curators of such museum exhibitions and collections function in ways akin to art educators as they create conditions for others to come into contact with artworks and to experience them. Students will study how contemporary art and curatorial practice can suggest other ways of conceptualizing and practising art education in and across a range of educative sites including schools, community settings, museums, and after-school programs.

Project-based Digital Visual Culture in Art Education

Through this course, students will learn theories of digital visual culture, including theories of new media, visual culture, visual literacy, and visual communication as it pertains to art education theory and practice in Canada. For the project component of the course, students will incorporate visual learning into setting up a virtual learning space, specifically in the virtual worlds of Second Life and Open Simulation. Students will deepen their understanding of virtual world pedagogy through this process. Toward the end of the program, students will experience teaching in their own virtual classroom using the virtual world pedagogy they have developed.

Education Package E- Culture, Creativity, and Learning Technologies

The Department of Curriculum and Pedagogy is on the cutting edge of implementing digital learning technologies across the curriculum in 21st century K-12 and university classrooms. Our professors infuse new media across the curriculum in ways that engage and inspire learners and are leaders in research of these ideas. This complementary course package will provide students with both theoretical and project-based learning, rooted in solo and collaborative contexts, as is fitting to exploring the uses and creation of digital learning tools, theories of digital learning, and international perspectives of the role of digital learners and curriculum.

Digital Media in Arts Education

This course is an introduction to teaching and learning with digital technologies through the creative arts. Beginning with an exploration of curriculum and pedagogy from an arts-based technological perspective, we will examine the multiple opportunities and challenges arising from using digital technologies to approach the creative arts in educational contexts. Using an up to date laboratory of computers, iPads, and synthesizers – students will work together in exploring digital music, video, photography, and other creative arts apps and software used in educational settings. Participants will take an active role in their learning processes – including setting goals, researching creative digital tools, engaging in peer-evaluation, participating in discussions, doing presentations, writing reflections, and seeking out relevant research readings and resources. This course will help students build a foundation for critical thinking about education, digital media, and the creative arts.

Learning Technologies and Creativity in the Digital Age

This course offers students a space to create and a community to explore ideas about integrating learning technologies in primary and secondary classrooms. Students will engage in this course as instructional designers, content creators, and tinkerers working together on personally or pedagogically meaningful projects. Learning involves defining problems and generating solutions, questioning assumptions, exercising ingenuity, prototyping, and experimenting with diverse ideas, materials, and perspectives. The educational philosophy underlying this course emphasizes project-based learning with digital media and technology. Students will have diverse opportunities to design innovative learning environments and create digital learning artifacts and resources. No background knowledge or experience is required for this package. Students will benefit from creative instructional strategies and technology-supported learning activities.

Education Package F - Food and Wellbeing—Learning the Connection

The Department of Curriculum and Pedagogy is in a unique position to be able to offer studies in food education that reflect international experience. This complementary course package will provide students with both theoretical and practical learning about food sustainability and the influence of our decisions. The course will be delivered by university faculty, chefs and teachers who will offer hands on experiences linked to thinking about food in both local and global ways.

Food – An Everyday Experience

Deciding what to eat is an everyday event that is experienced in every culture and location. Learning about food requires knowing more than just how to be a consumer. This is an introductory course that provides a broad overview of different foods, food safety and preparation techniques and explores how food decisions can support wellbeing. Students will have an opportunity to reflect on their own food choices and develop critical thinking and collaborative work skills through class discussions and assignments. Topics to be discussed include: food supply in the Western context and how this compares to students' experiences; what influences our food choices; and everyday food practices and how these are linked to globalization. By the end of the course students will have participated in a range of activities including visits to farms and markets; experts who will talk about how they prepare and provide food; and teaching about foods from their culture.

Thoughtful Eating in a Globalized World

Developing understanding about how food is produced from farms, to production and final places for consumption from across a range of different cultural and geographic contexts is an important prerequisite for sustainability in an increasingly globalized world. The aims of this course are to help students develop understandings about sustainable food production and eating safe food. Topics of this course will introduce differences in food production as a cyclic process rather than one that is linear; food safety and eating for wellbeing. By the end of the course students will: be familiar with sustainability concepts; develop holistic strategies for eating that enhances wellbeing; and to be able to apply the learning to their everyday experiences. They will have experienced a range of locations where food is purchased and consumed; maintained a journal that will allow students to think about how people make their food decisions and considered the implications of different ways of eating that have an impact at local and global levels.

Education Package G – Exploring IB—Internationally-minded Approaches to Education

Teaching, according to Brad Henry in Love, Learning, Hope, not only inspires hope and ignites the imagination it also serves as one of the most dynamic, exciting and fulfilling professions of all. If you have ever considered a career in teaching you will want to enrol in this complementary package of courses. Designed for students considering teaching in an International Baccalaureate school setting, the courses will give you the opportunity not only to learn about teaching methods and strategies used in IB but also to practice them in a safe and supportive classroom environment. As well, you will learn about IB curriculum and assessment in IB's four programs through direct presentation from experienced IB educators, student-led group projects and guided inquiry.

Effective Classroom Teaching (IB)

Consisting of four unique and highly regarded K to 12 programmes, an International Baccalaureate education is student-centred, focused on critical thinking and principled action, and internationally minded. In this course, students will be introduced to many of the core skills and attributes which help define effective IB teaching. These include inquiry-based instruction, professionally focused collaborative teams, cooperative teaching approaches, Socratic dialogue and student metacognition. Students will have the opportunity to work in group settings with their classmates, engage in real-life Case Studies and learn from one another in a setting which is safe and supportive. By the end of the program, students will have a much better understanding of IB pedagogy and be well positioned to decide if a full International Baccalaureate Certificate in Teaching and Learning is for them.

Curriculum Design and Student Evaluation (IB)

The second of the two courses examining International Baccalaureate practice is focused on curriculum – more specifically what is termed the written, taught and assessed curriculum of IB. To begin the course, students will be introduced to a broad examination of the concept of curriculum following which they will learn how it is enacted in each of IB's four programmes: PYP, MYP, DP and CP. In addition to the frameworks and content of these programmes, students will also discover how international mindedness, collaboration and service are key to the IB. The course will conclude with an examination of assessment and evaluation, both in general terms and more specifically how it is practiced in each of the IB programmes. The course is highly interactive in nature and designed to allow students time to pose their own questions and reflect on their own learnings. As with the complementary course, it will help students decide if they wish to pursue the full IBCTL.

Education Package H – Early Childhood Education and Development

Our early childhood courses focus on creating exceptional educational programs for children between the ages of three to eight. The courses are carefully designed to introduce international students to research and theory pertaining to the education of young children. International students will be provided with opportunities to learn how theory is connected to practice by engaging in field study activities such as observing in early childhood classrooms and studying educational materials and resources that are used in Canadian early childhood classrooms.

Designing High Quality Curriculum in Early Childhood Settings

This course addresses the notion that children are natural learners. Students will learn about, discuss, and clarify important concepts and theories relative to early childhood education, including child development theory and the holistic nature of learning in the early years. The course highlights the idea that young children's innate capacity to learn and teachers' responses to children's inquiries provide the foundation for the development of high quality early learning experiences for young children and impacts the type of programming that is created. Students will learn about designing appropriate daily routines and implementing teaching strategies for integrating different areas of learning, such as literacy, math, science, and art through inquiry and project-based learning. The course will also include observations in local early childhood settings.

Creating Environments to Support Learning in Early Childhood Settings

This course introduces students to the significant role that designing stimulating and nurturing early childhood classroom environments plays in children's learning and in supporting all aspects of their development and growth. Students will learn about creating dynamic indoor and outdoor learning spaces for young children and the importance of providing children with original and natural educational materials and resources. The course will include visits to local state-of-the-art early childhood environments for young children.

Education Package I – School Curriculum and Educational Leadership

The Department of Curriculum and Pedagogy and The Department of Educational Studies combine their strengths to offer this exciting package on school curriculum and educational leadership. These courses are intended to introduce international students to research, theories and practices in school curriculum and educational leadership. Both courses use a theme-based approach to engage participants with works of North American scholars and to animate discussions on their relevance and possible applications in global educational settings.

Introduction to Curriculum and Pedagogy

This course offers an introduction to North American perspectives and practices in curriculum and pedagogy. Curriculum is approached in this course as an on-going living document that continually invites teachers to find ways to engage, inspire, transform, and intellectually challenge students' learning experience, with careful consideration of suitable pedagogies. This course introduces the curricular of planning, designing, improvising and analyzing, through the exploration of readings and discussions from diverse works of North American curriculum and pedagogy theorists, drawing on examples spanning a wide range of disciplines and including cross-cutting themes such as multiculturalism. As part of the course, participants will have an opportunity to create a curriculum document specific to their own area of interest.

Educational Leadership in School Settings

Schools are more than human communities, where teachers and students live and learn together - they are also public instruments reflecting wider societal orientations within specific sociocultural context (Manzer, 1994). With this in mind, this course is built around four major themes to explore educational leadership in school settings. Participants will reflect on the philosophical, historical, anthropological, sociological, and economic assumptions underlying concepts of educational leadership and power. They will examine several, sometimes conflicting, models of educational leadership. They will analyze how the policy context of educational leadership is understood and constructed within various socio-cultural, political, and economic realities and will review how educational leadership is studied in terms of conceptual models. The course will also address ethical issues associated with educational leadership across cultures.

Forestry

Forestry Package A – Forest Management and the Effects of Carbon

An Introduction to the Ecology, Economics and Politics of Carbon

Humans use carbon-based molecules in almost all aspects of daily life – food, shelter, clothing, and power generation are but a few examples. Unfortunately, deforestation, land degradation, and fossil fuel emissions are responsible for the build-up of carbon in the atmosphere. This is causing the atmosphere to heat up which in turn is changing the global climate. To understand why this is a problem and what we can do about it, students will be provided with an introduction to the ecology of carbon (where it is, and how it cycles through the living and non-living world). We will then discuss the challenges of limiting carbon emissions by considering the interaction between economics and politics.

Sustainable Forest Management

This course represents an attempt to integrate knowledge and processes relating to forest management across a wide array of disciplines, but it is centrally concerned with bringing the underlying ecological and management science together. It involves a mix of lectures, group discussions and field visits to increase the understanding of students about problems involved with managing forest ecosystems for a variety of societal goals and objectives. The course is heavily geared towards ecological, economic and policy context of British Columbia; however, international implications and issues of forest management are also covered. The objective of the course is to familiarize the students with a variety of forest ecosystem values and their management issues and to enable meaningful analysis of the current issues in forest sustainability.

Lectures are interactive and students are encouraged to participate in discussion on topics raised in class. Moreover, past field trips pertaining to this Package have included a tour of environmentally sustainable buildings at UBC, a walk through Pacific Spirit Park as well as a tour of the UBC Botanical Gardens.

Forestry Package B – Wood Products and Machinery

Manufacturing of Wood Products

The objective of the course is to provide an overview of the secondary wood product manufacturing sector. This includes the transformation from a design idea into a finished product, considering digital design aspects, materials, as well as construction principles. In addition, it builds the base for module B "Introduction to woodworking machinery".

Introduction to Woodworking Machinery

The focus of module B is to highlight the utilization of the state-of-the-art woodworking machinery. This includes safe working procedures, the explanation of various production equipment, as well as the manufacturing processes needed for production of wood products. Students will use the High Head Machine Lab at the Centre for Advanced Wood Processing to work on a hands-on project to enhance and apply the skills and knowledge learned in both modules.

Forestry Package C – Urban Forestry

An Introduction to Urban Forestry

This course will provide a general introduction to the concept of Urban Forestry and why this is an important topic in today's rapidly urbanizing society. There is a growing need to adapt to multiple impacts of climate change; and increasing demand from the public for the recreational, psychological

and health benefits that green-space networks provide. With increased urban populations, global warming, urban heat islands, flooding and pollution, cities may become unlivable or demand massive energy-use for cooling, unless we can establish large scale, healthy urban forest systems.

Green-Space Management in North America

Urban forestry is about planning and managing urban green-spaces and ecosystems for human welfare, ecological health, and protection of our cities' support systems. Urban forest networks, parks, wetlands, and other green infrastructures are vital in moderating heat waves and cooling demands, maintaining biodiversity and carbon sinks, controlling forest fires, storm-water flood mitigation, bio-energy production, etc. Urban Forests improve and protect our health, property values, local jobs and businesses, outdoor recreation opportunities, and community character. This course will give the students an introduction to the importance of understanding urban forestry in the face of today's rapid urbanization as forests and green systems compete for space among buildings, roads/transit, storage facilities, and energy infrastructure.

Students will be able to experience the concepts learned in class through fieldtrips and class activities. Past participants have been taken on fieldtrips to various locations around the Greater Vancouver area including Surrey, North Vancouver and Stanley Park. There was also a tour of the UBC Botanical Gardens as well as other guided walks through the UBC campus designed to demonstrate the many facets of urban forestry.

Kinesiology

Kinesiology Package A - Sport and Exercise Performance

Students enrolled in this package will explore the exercise-related concepts in classrooms, laboratories and through field trips. Past participants visited the Richmond Oval, a World-Class recreation facility and a 2010 Winter Olympic venue; BC Place, the host of the Opening and Closing Ceremonies of the Vancouver 2010 Olympic Winter Games and the FIFA Women's World Cup Canada 2015; and the Physical Activity Research Centre (PARC), an 11,000-square-metre, state-of-the-art research facility that brings together one of the most interdisciplinary Spinal Cord Injury research programs in the world.

Sport and Exercise Psychology

This theory-based course offers a practical overview of core topics and applications in sport and exercise psychology. The course is intended to develop students' understanding of psychological factors that impact participation and performance in physical activity contexts. Students will have the opportunity to participate in group activities, apply knowledge to specific scenarios, and develop mental skills to demonstrate the application of psychological approaches. In particular, students are encouraged to reflect on how they can translate theoretical concepts and models into practice. Past guest lecturer for this class includes Matt Fisher, Head Strength and Conditioning Coach and part of the Integrated Support Team Lead for Canada Snowboard's National Freestyle Program for the 2010 Winter Olympics team.

Clinical Exercise Physiology

This theoretical and lab-based course will provide an overview of clinical exercise physiology. Diverse class activities including problem-based case studies, group projects, hands-on labs examine cardio respiratory function, muscle function, and metabolism. The course will include visits to labs such as the world-renowned research centre for rehabilitation (PARC) will facilitate an active learning environment. Upon completion of this course, students will develop an understanding of fundamental approaches to the assessment of physiological responses to exercise; altered responses in various clinical syndromes; and how exercise prescription and exercise monitoring is applied in the clinical settings for health promotion. Students will also gain an appreciation of the influence of exercise and lifestyle on the prevention and treatment of chronic diseases.

Kinesiology Package B - Coaching Science

Students enrolled in this package will experience interactive learning from lectures followed by interactive practical sessions either outdoor or in the gymnasium. Past participants were taken on field trips to the UBC Doug Mitchell Thunderbird Sports Centre; the Richmond Oval, a World-Class recreation facility and one of the 2010 Winter Olympic venues; and the UBC Baseball Indoor Training Centre, a $3.5-million-dollar state-of-the-art indoor training facility.

Foundations of Coaching

This introductory course to coaching provides the foundation to become a successful coach. It will enable students to define who they are as coaches and will enhance their training and development skills with supplemental knowledge in strength and conditioning, nutrition, motor learning development, and performance planning. Practical outdoor sessions are offered in conjunction with the lectures to demonstrate core concepts in coaching. Upon completion of the course the student will be able to recognize the power inherent in coaching by creating their 'coaching philosophy' and apply process to achieve it. They will learn how to recognize common sport injuries and provide a safe training and competition environment, how to use games for learning skill and building physical condition, and how to apply basic prophylactic and supportive taping systems.

Sport Psychology for Coaching

This course provides a broad overview of major topics in Sport Psychology for Coaching. The student will develop an awareness of how sport and exercise psychology knowledge can be applied in coaching and understand the importance of the many mental aspects of coaching including group dynamics, motivation, leadership, coach-athlete relationships and mental skill training. Complementary activities including outdoor games, tours of sport training centers, sport facilities and research labs are designed to facilitate interactive learning.

Kinesiology Package C - Clinical Kinesiology

Exercise is now recognized as a fundamental lifestyle component of health promotion and is now an integral part of prescriptive approaches to the treatment of ~26 chronic diseases or conditions such as heart disease, lung disease, diabetes, cancer, dementia, and other degenerative diseases. Students enrolled in this package will be exposed to the theoretical basis for the mechanisms for exercise as a therapeutic approach to health promotion. Concepts learned in class will be supported by lab-based sessions covering testing and monitoring of exercise training programs. Participants will have the

opportunity to visit the Physical Activity Research Centre (PARC), an 11,000-square-metre, state-of-the-art research facility that brings together one of the most interdisciplinary Spinal Cord Injury research programs in the world and the UBC Allan McGavin Sports Medicine Centre, one of only two FIFA Medical Centres of Excellence in Canada.

Clinical Exercise Physiology

This theoretical and lab-based course will provide an overview of clinical exercise physiology. Diverse class activities including problem-based case studies, group projects, hands-on labs examine cardio respiratory function, muscle function, and metabolism. The course will include visits to labs such as the world-renowned research centre for rehabilitation (PARC) will facilitate an active learning environment. Upon completion of this course, students will develop an understanding of fundamental approaches to the assessment of physiological responses to exercise; altered responses in various clinical syndromes; and how exercise prescription and exercise monitoring is applied in the clinical settings for health promotion. Students will also gain an appreciation of the influence of exercise and lifestyle on the prevention and treatment of chronic diseases.

Health and Physical Activity Behaviour

This psychology-based course examines how engagement in health and physical activity behaviours affect health outcomes across the lifespan, and how individual engagement can be changed by intervention and health promotion strategies. Upon completion of the course, students will gain an understanding of models of behavioural change that promote health and physical activity behaviours, along with their application towards intervention design, development, and evaluation to encourage adoption and maintenance of physical activity amongst special populations.

Land and Food Systems

LFS Package A - Food Science and Sensory Evaluation

Introduction to Food Science

An introduction to key concepts related to the science of food: the Canadian food system, chemical and physical properties of foods, government regulations, food additives, food preservation techniques, food safety, and trends in foods for nutrition and health. Students will learn to arrive at an informed position about controversial issues relating to the food that they encounter as consumers in the marketplace, and that they hear about in the media.

The Science of Sensory Evaluation

The sensory characteristics of a food are critical in the development of new food products and determine its success in the marketplace. Sensory evaluation is a science measuring human responses to food attributes, such as texture, flavor, smell, and color of a food. There are special challenges in sensory evaluation because people are subject to various environmental and psychological and culture biases, and pose ethical considerations. In this course, you will learn sensory evaluation theory, participate in demonstrations and evaluations as both panelist and sensory analyst, and explore basic techniques used to analyze sensory data.

LFS Package B - Agribusiness Management

Food and Agribusiness Enterprise Management

This course is designed to introduce the principles of financial and business management that are most relevant to agri-food and related firms. The content of the course will provide students with the insights and skills necessary to develop, evaluate and implement financial and management strategies. This will be accomplished through the presentation of management fundamentals, financial principles, decision and project planning frameworks, completion of cases and current article reviews, class discussions and final enterprise management presentation. Emphasis will be placed on the unique considerations of management within the agriculture, food and agribusiness sectors.

Food and Agribusiness Marketing Management

This course is designed to introduce the principles of marketing management and assessment that are most relevant to agri-food and related firms. The content of the course will focus on the macro and micro aspects of marketing management. Specific topics include basic principles and types of marketing such as production, selling and social marketing; marketing frameworks to assess industry and competitive landscape; identification of the ideal customer; market research survey development and assessment, use of excel for market survey and data analysis and secondary research methods and the sources.

LFS Package C – Nutritional Sciences

Essentials of Nutrition

In this introduction to nutrition, students will learn about nutrients: what they are, why they are important to health, recommended intakes, and common Canadian food sources. Controversial topics in nutrition will be explored. Upon completion of the course, students will be able to sort out fact from fiction by applying their knowledge of nutrition to everyday scenarios and to their personal diets.

Healthy Eating – The Canadian Way

This course will focus on the life applications of nutrition concepts learned from the Essentials of Nutrition, from a Canadian perspective. Students will also learn principles of food preparation based on the physical and chemical properties of food. The objective of this course is to give students practical, hands-on experience with various aspects of food choice, food preparation, and fundamental skills and knowledge in recipe modification and sensory evaluation of food.

Students will expand their knowledge of food and nutrition through exposure to a wide variety of foods from the many cultures making up Canada's cultural mosaic, working in small groups to prepare recipes that illustrate key concepts. Upon completion of the course, students should be able to demonstrate understanding of fundamental knowledge and skills including the practice of kitchen and food safety, practical outcomes of recipe modification and measurement techniques; apply knowledge and principles of food preparation to a wide variety of foods; understand the role and interactions of ingredients in food preparation; be familiar with the wide variety of foods available to consumers, their preparation techniques, and their nutritional attributes.

LFS Package D –Eat. Write. Here: Food Literature and Food Literacy in Vancouver

This package integrates perspectives from two faculties at UBC, Land and Food Systems with English, and allows students to explore and experience food and food's crucial connection to belonging, home and place. Getting closer to these food experiences and generating new experiences with food – or "playing with our food" – enables us to learn and understand places ecologically, politically, socially, and culturally.

Food Literature

> "Hot dog, no head, no tail. Not real food," Poh-Poh said, rolling up her sleeve to tear the feathers off a freshly killed chicken. She lifted its sagging head. "This real food." – Wayson Choi's All That Matters

Inspired by the "Food Literacy" field trips and workshops, students will read Vancouver-specific food stories on the way to understanding Vancouver as a diverse food-rich place. We will spend time thinking about how food supports and sustains our definitions of home and our familial, cultural, social, environmental, sustainable, and political relationships with place. Students will write about their experiences reading the stories, and inhabiting place through food.

Food Literacy

Have you ever baked bread, planted beans, composted, sampled milk and milk alternatives, made tea from foraged plants? While reading Vancouver literature about the relationships between food and place-specific belonging, students will explore food literacy through hands-on experiences of Vancouver's foodscapes. Students will develop food literacy skills through field trips – to UBC farms, to Granville Island, to China Town, to Gordon Neighbourhood house, to a fast food restaurant, to forage at the beach and in the forest – and workshops, growing, preparing, and sharing through Vancouver's food assets. Students will write about their very local experiences exploring the food cycle.

Medicine

Medicine Package A – Clinical Research and Clinical Medicine

Introduction to Clinical Research in the Sciences (Pediatrics)

This course provides a window into how clinical research is conducted in the medical sciences. Research methodologies, research process, ethical considerations and practical tips for conducting high-yield, evidence-driven research with patients will all be presented and discussed. The course includes lectures, workshops and a hands-on mentored individual research project by students that will be presented at the end of the course. A wide variety of health care providers and medical educators will participate in the course and provide examples of research conducted at UBC and other academic institutions. Engaging speakers, visits to clinical research facilities and effective mentorship techniques will provide students with a once-in-a-lifetime opportunity to take part in the most advanced learning in basic clinical research.

Introduction to Clinical Medicine at the Bedside (Pediatrics)

This course will bring medical and science students close to the real life of medicine in the 21st century. Students will be able to meet up close with practicing clinicians who manage complex patients every day as part of their work in the hospital and clinic setting. Using advanced teaching tools such as medical simulation, and together with experienced physicians from multiple disciplines of medicine, students will learn how to approach patients with medical history taking, physical examination, development of a medical differential diagnosis, and will gain knowledge in determining the need for investigations in order to reach a diagnosis and a develop a treatment plan. A combination of lectures, simulation labs, case-based workshops and visits to laboratory and clinical areas, will enhance the hands-on experience and understanding of the medical and other sciences.

Medicine Package B – Pharmacology and Critical Analysis in Medicine and Science

The Department of Anesthesiology, Pharmacology & Therapeutics is committed to excellence in education and research through creativity and dedication. Our teaching programs are synonymous with consistent educational excellence, and our students are recognized locally, nationally and internationally for their knowledge and skills developed and honed under our award-winning instructors.

Pharmacology through Case Studies (Anesthesiology, Pharmacology & Therapeutics)

You will experience an integrated approach to learning pharmacology through the use of simulated clinical cases specifically designed to highlight the fundamental principles. Knowledge acquisition from both the scientific and clinical perspectives will be supported through complementary lectures and small group exercises. You will have the chance to design and present your very own case study, incorporating the newly learned pharmacological concepts with your creativity and analytical skills. Through this educational model, you will explore the basic science and clinical applications of cardiovascular, respiratory, gastrointestinal, reproductive, endocrine and autonomic pharmacology, and their integration across multiple related disciplines.

Primary Literature Analysis in Science and Medicine (Anesthesiology, Pharmacology & Therapeutics)

This course will empower you with an understanding of the scientific method and the important decisions that must be carefully considered in designing, conducting and communicating experimental studies, providing the foundation needed to adequately review and appraise primary literature in any clinical or basic science discipline. The resulting downstream consequences of poor experimental design and interpretation of results in informing (or formulating) evidence-based medicine will also be explored. You will learn about the different types of studies that can be conducted, the major elements of an experiment, and the overall publication process. Through lectures, small group exercises and discussions, you will develop the skills necessary to critically evaluate study research questions, strategies of subject selection and randomization, and proper use of controls. You will learn to identify confounding factors such as inadequate study design, bias, and poor statistical analysis – intentional or not – and describe how they may impact the quality of the underlying study conclusions, culminating in the opportunity to apply this knowledge through a group critical analysis of literature presentation at the end of the course.

Medicine Package C: Anatomy and Radiology: Interactive Learning to Enhance Understanding

Introduction to Medical Imaging: Understanding radiologic normal anatomy and disease using cutting-edge technology (Radiology)

This course will provide an introductory understanding of the imaging modalities (plain radiographs, ultrasound, CT and MRI, plus some limited discussion of interventional radiology) used to solve common clinical problems in all body systems. Considerable time will be spent reviewing imaging of normal anatomy, using gross anatomy-cross sectional imaging correlation, and this will be followed by demonstration of the critical role that modern imaging plays in Cardiac, Pulmonary, GI, Neurologic and Musculoskeletal disorders. Students will gain an understanding of the indications and contra-indications for specific imaging tests, and the advantages and disadvantages of each modality in common clinical scenarios. Case-based learning, interactive sessions, and possible hands-on ultrasound will augment didactic lectures, which will be given by subspecialty Radiologists, Fellows, and Residents. A tour of a modern tertiary care hospital imaging department will form part of the course. The course will conclude with a presentation entitled: 'Top ten don't miss cases in Radiology'.

Introduction to Anatomy using a Hands-on Approach (Cellular and Physiological Sciences)

This course will cover foundational functional anatomy including all major organ systems as well as the musculoskeletal system. Students will learn how the human body develops through the embryonic period to give rise to these systems and how they are functionally and structurally related to each other. Thoracic anatomy will focus on the cardiovascular and pulmonary systems, abdominal anatomy on the digestive and renal system and pelvic anatomy on the reproductive systems. The musculoskeletal system will be covered from a conceptual point of view focusing on the major functions of the upper and lower limbs and the importance of the musculoskeletal system for human form and structure. This course will give a basic foundation in functional anatomy that will help students as they prepare for life and health sciences programs.

Medicine Package D – Biochemistry and Molecular Biology in Human Health, Disease, and the Environment

Molecular Mechanisms of Disease (Biochemistry and Molecular Biology)

This course will provide an introduction to the molecular basis of disease and the concepts behind novel molecular therapies. Students will gain an understanding of fundamental human biochemical pathways and learn how molecular perturbations in these pathways via genetics, environmental insults and pathogens can lead to disease. Several case-based topics will be presented featuring work from world-renowned UBC faculty. The course will be taught through a combination of lectures, student presentations and small group problem-based learning all led by UBC experts. Course content will vary but may include topics such as the role of gut microbiota in health, cancer, diabetes and cardiovascular disease. Several novel molecular therapeutic strategies will be discussed and may include genetically engineered gene/cell based therapies, stem cell cures, siRNA based expression control, and nanoparticle delivery systems. This course is intended for students in medical programs or life science related fields.

Environmental Biochemistry (Biochemistry and Molecular Biology)

Environmental Biochemistry will critically examine biochemical and chemical processes in the world at large and the impact on human health. The course will provide students with the scientific principles and concepts required to understand key interrelationships of the natural world and tackle the most daunting challenges of the 21st century. We will explore and debate key processes in a case-based approach. Topics discussed may include life & water (quantity and quality), pH and ocean acidification, UV-B radiation, sustainable vs. unsustainable energy flows, cycles of carbon & nitrogen, chemicals in the environment (e.g. glyphosate, neonicotinoids, heavy metals, crude oil, SO2, pesticides, dioxins and PCBs, environmental estrogens), food security (synthetic fertilizers, genetically modified organisms, pesticides, herbicides), smog & others. Students will incorporate current issues into their work featuring small group discussions, learn to evaluate the relative risks of many present-day problems and gain the tools to further explore these topics.

Pre-requisites: Students are expected to have a strong background in biology and chemistry at a level equivalent to typical 1st year North American undergraduate courses. Students lacking a basic biochemistry background can expect a higher workload compared to students with previous biochemistry knowledge.

Medicine Package E – The Science Behind the Mind and Psychiatric Disorders and their Pharmacological Treatments

Introduction to the Science behind the Mind (Psychiatry)

This course will offer you an introduction to the mind and basic neuroanatomy emphasizing which brain structures play a role in the generation of normal and abnormal mental states. You will learn about the neurological basis of mental illness and the mental status examination. In addition to the main instructors, you will learn from guest lecturers who will share their knowledge and expertise in specialized fields of study. Past guest lecturers included experts in neuroimaging, neurostimulation and EEG, neurogenetics, and neuropsychology. Classes are lecture-based with fieldtrips and labs. The course will be at a level suitable for students who have completed Year 2 of undergraduate studies in Medicine.

Introduction to Psychiatric Disorders and their Pharmacological Treatment (Psychiatry)

This course will cover the major psychiatric disorders that include schizophrenia, major depressive disorder and bipolar disorder. Over the duration of the course, you will learn the symptoms and neurobiology of these disorders, and how pharmacological therapies work to treat target symptoms. You will study the pharmacology of these drugs at the molecular level which will provide you with the foundation for understanding their clinical application. Finally, you will learn about treatment strategies using the most up-to-date evidence-based treatment guidelines. Classes are lecture-based with group discussions. The course will be at a level suitable for students who have completed Year 2 of undergraduate studies in Medicine.

Medicine Package F – Major Mental Illnesses and Psychotherapy

Mood Disorders and Psychosis: Assessment and Diagnosis (Psychiatry)

This course will provide you with a broad overview of mood disorders (such as clinical depression and bipolar disorder) and psychosis (where reality testing is impaired, such as in schizophrenia). Mood disorders and psychosis are among the most disabling psychiatric conditions worldwide, due to significant symptoms and functional impairments that can lead to both personal distress and substantial economic burden on society. A major focus of this course will be identification and assessment, and accurate differential diagnosis. Additional topics will include epidemiology, neurobiology, psychosocial factors, and a variety of evidence-based interventions and therapies. Classes are lecture-based with group work, discussions, and a lab tour/demonstration. This course will be at a level suitable for students who have completed Year 1 of undergraduate studies in Medicine.

Introduction to Psychotherapy (Psychiatry)

This course will provide you with an introduction to the theory and practice of psychotherapy, focusing on core principles and skills that can be applied across a range of clinical and practice contexts. The course will orient you to the evolution of psychotherapy as an evidence-based intervention for common mental health disorders. You will learn about the common elements of major models of psychotherapy. The course will also cover practical skills such as interviewing, assessment, and building and maintaining therapeutic alliance – skills that can benefit all helping professionals. Lectures will include video demonstrations of psychotherapy, and role-playing exercises to develop practice skills.

Medicine Package G – Introduction to Population and Public Health

Population and public health focus on the health of populations and communities, asking questions like 'why are some people healthy and others not?' and 'how can we proactively improve people's well-being?' These topics are important to students interested in medicine or health sciences because they provide a broader prospective on the notion of health and what it means. The course also provides students the skills and knowledge to begin advocating for health equity and seeking ways to promote health on a large scale. Through presentations, problem-based learning, group assignments, class discussions and field trips, students will expand their understanding of health and consider how to apply these ideas in their home countries and elsewhere.

Social Determinants of Health (Population and Public Health)

In this course you will broaden your understanding of how social factors, such as skin colour and income, affect population and public health. We will explore the meaning of health and its measurement, and examine what influences the health, well-being and quality of life of individuals, families, communities and nations. You will gain an understanding of the complex pathways through which social circumstances affect health and well-being, and hands-on experience thinking through real world problems. Lectures in class are followed by interactive group activities and trips outside of the classroom to explore health promotion services in Vancouver. This class will bring a new light to your

understanding of the factors that affect health, and challenge you to think differently about what we can do as a society to decrease health inequities.

Introduction to Population and Public Health Practice (Population and Public Health)
This course addresses the question of how we can *respond to* population and public health concerns. It introduces the student to key perspectives and frameworks that are used to inform activities that can improve the health of individuals, families, communities and nations. Potential approaches to preventing disease and improving health, such as a focus on the prevention of disease, screening for disease, the implementation of monitoring and surveillance systems, and the treatment of disease will be covered. Key frameworks such as types of prevention (i.e. primary, secondary, tertiary), and evaluating the cost and effectiveness of activities will also be considered.

Medicine Package H – Understanding the Recovery and Treatment from Injury and Chronic Disease

Exercise is Medicine (Physical Therapy)
This course will provide an exploration of exercise and physical activity in the treatment of chronic health conditions. Through an exploration of chronic conditions such as arthritis, cancer, cognitive impairment and cardiovascular disease, you will gain an appreciation of the effects of exercise on brain function, bone and muscle health, and cardiovascular function. Topics will also include the epidemiology of physical inactivity across the world, measurement of physical activity in chronic disease, strategies to get a nation more active, role of health professionals in physical activity prevention and treatment, and mobile technology to motivate physical activity in chronic disease. Students will use a variety of interactive methods to understand the content, including case studies, small group tutorials, and problem-based learning. Students will have hands-on labs in a state-of-art fitness and exercise research facility designed to enable access for people with chronic disease and disability, interact with new mobile technology to motivate physical activity and measure the impact of exercise on physical function and cognition.

Recovery from Injury (Physical Therapy)
This course will introduce students to the science of rehabilitation and recovery from injury and disease. Through this approach, students will understand how severe injuries and chronic diseases can impact the patient and family, both physically and emotionally. Conditions such as spinal cord injury, concussion, stroke, arthritis, and chronic obstructive pulmonary disease will be used to illustrate the journey through rehabilitation, the road to recovery and adjustment to disability. Along this journey, students will be introduced to concepts about the musculoskeletal, cardiovascular, pulmonary and neurological systems, as well as coping mechanisms and quality of life. In addition, cutting-edge research on novel rehabilitation treatments will be introduced, including a visit to a world famous spinal cord injury research centre to view the latest treatments, including robotic suits to permit walking after spinal cord injury and e-Health applications (e.g., tele-medicine, video games, wearable sensors) to improve function. Students will use a variety of interactive methods to understand the content, including, small group tutorials, and problem-based learning.

Medicine Package I – Medical Laboratory Science

This course package is offered through the Department of Pathology and Laboratory Medicine, home to nationally and internationally recognized researchers and award-winning teachers. Together, we are active in all spheres of inquiry and education concerning the causes and mechanisms of disease.

Introduction to Medical Laboratory Science (Pathology and Laboratory Medicine)

You will explore the normal and abnormal biochemistry and physiology of blood and organ systems including the liver, gastrointestinal tract, and kidneys. You will solve medical case studies and diagnose diseases by interpreting patient history information, physical findings, and results of selected clinical laboratory tests. You will participate in case-based learning, team presentations, interactive lectures, and a hands-on blood cell morphology laboratory session in which you prepare and stain blood smears, then distinguish different cells under the microscope. You will also take guided tours of clinical research lab facilities and of the David Hardwick Pathology Learning Centre which houses tissue specimens representing a wide range of pathological conditions. Past students stated they "learned a lot – not only knowledge, but the way to get knowledge ….and had lots of fun in this class". They valued the team-work and interacting with instructors who were "very knowledgeable, approachable and kind".

Fundamental Techniques for Clinical and Medical Research Laboratories (Pathology and Laboratory Medicine)

The focus of this course will be to perform methods that are commonly used in hospital and biomedical research laboratories. You will learn through hands-on laboratory sessions and will focus on the following disciplines: molecular biology, cell culture and histochemistry. Experiments you will conduct include DNA finger printing and culturing a mammalian cell line. You will also conduct a series of experiments using different staining techniques and microscopically determine the composition of unknown tissues. Your learning will be supported through demonstrations, discussions of experimental design, data analysis activities and interactive lecture sessions. Past students stated that they "enjoyed extracting and analyzing their own DNA" and that the cell culture labs were "very unique and interesting - something we cannot do in our home country." They were also "excited to analyze their slides and share with others during their histochemistry presentations".

Medicine Package J – Anatomical Sciences

Principles of Body Structure and Function (Cellular and Physiological Sciences)

This course will cover foundational functional anatomy including all major organ systems as well as the musculoskeletal system. Students will learn how the human body develops through the embryonic period to give rise to these systems and how they are functionally and structurally related to each other. Thoracic anatomy will focus on the cardiovascular and pulmonary systems, abdominal anatomy on the digestive and renal system and pelvic anatomy on the reproductive systems. The musculoskeletal system will be covered from a conceptual point of view focusing on the major functions of the upper and lower limbs and the importance of the musculoskeletal system for human form and structure. This course will give a basic foundation in functional anatomy that will help students as they prepare for life and health sciences programs.

Applied Neuroanatomy (Cellular and Physiological Sciences)

This course will take students through the fundamental principles of how our nervous system works. Students will learn about both the peripheral and central nervous systems and how they interact to allow us to experience and interact with the world around us. Higher order systems in the cerebral cortex will be explored and include both primary areas of the cortex and association areas that process information and put it into context. The control of cortical output through intricate systems will be discussed as well as the importance of areas involved in emotional processing. At the end of the course students will have gained a basic understanding of CNS pathways and functions that will give them a solid foundation for many life sciences programs, in particular health sciences or neuroscience.

Pharmaceutical Sciences

Making Better Medicines Package

The Discovery of New Medicines

"What does it take to find a new drug?" The objective of the course will be to answer this question by introducing the participants to the drug discovery and development process. Specifically, the role of the Pharmaceutical Sciences in the discovery of new medicines will be described. Case studies will be presented by experienced scientists that illustrate challenges that interdisciplinary drug discovery teams must overcome. In addition, participants will have an opportunity to visit the laboratories of a local research organization involved in supporting drug discovery efforts. By taking this course, participants will gain an appreciation of the collaborative work that is required in the search for new therapies.

Personalizing Medicines with Genomics and Biotechnology

For millennia, we have sought to understand how to treat disease using potions, teas, pills and most recently, genetically engineered cells. Indeed, the use of cutting-edge technology in drug discovery is not new – for example, the most powerful anti-malaria drug was re-discovered in the writings of Ge Hong, a physician who practiced 1700 years ago. Today when one thinks of drug discovery and development, large multibillion dollar pharmaceutical companies come to mind, with their remarkable medications for infections, heart disease and cancer. Despite their effectiveness, these medicines tend to treat all patients as members of one homogeneous population. Obviously every patient is unique and the best medicine for you is one that is tailored to you. Recently, next generation DNA sequencing is making this possibility a reality. Cancer treatments can now be designed to match your specific DNA, eliminating the trial-and-error approach to treatment. Similarly, DNA sequencing can match your prescriptions to your genome. The integration of DNA sequencing with drug therapy has been a disruptive innovation, bringing the science of "big data" to medicine and pharmacy. In this course we will explore how these and other innovations are revolutionizing healthcare and wellness. Students will have the opportunity to explore these innovations first hand in the laboratory.

Science - Earth Ocean and Atmospheric Sciences

Science EOAS Package A – The Dynamic Earth and its Beautiful Treasures

This package is designed to examine the origin and formation of our planet and its economic resources. From its early beginnings our planet has evolved dramatically, with an ever changing surface subject to

vast plate movements and billions of years of weathering and erosion. Students will discover how volcanoes, meteor impacts, earthquakes, winds, moving water, glaciers during ice ages and the relentless grind and recycling of rocks by plate tectonics shape our planet, and explain our geological resources. Both courses emphasize experiential learning where concepts are discovered through active learning in the classroom, innovative laboratory experiments and field trips to collect and interpret observations in and around Vancouver.
No background knowledge of geology is required for this package.

The Dynamic Planet
This course considers how an active and evolving Earth system has created the planet we know today, one that supports diverse life and is rich in natural resources. Using international and Canadian examples, we will examine the origin of our planet and its composition and structure. From mountains to glaciers, earthquakes to volcanoes, ancient rocks and mighty dinosaurs, Canada is a wonderful natural laboratory that we will use to investigate our active and dynamic planet.

Earth Treasures
Canada is also known for its spectacular precious metals and gems, some of them housed in our departmental museum, The Pacific Museum of the Earth. This course investigates the formation, exploration, mining and aspects of marketing of gemstones and precious metals. We touch on topics such as fundamental scientific concepts, natural and synthetic gems and explore the world of fine jewelry. The origin, valuation and exploration strategies for gems such as diamonds and precious metals such as gold and platinum will be investigated here and placed into a fascinating international and Canadian geological context.
Our emphasis is on active learning teaching methods where students are inspired to explore the subject matter through field trips, labs, discussions and in class activities.
No background knowledge of geology is required for this package.

Science EOAS Package B – The Earth's Oceans, Atmosphere and Climate
In this package we explore the dominant processes that control the atmosphere and the oceans, and investigate the diversity of life found in marine ecosystems. Students will discover how energy flows through these systems and how the energy flow controls winds and ocean currents. We will discover how the winds and currents influence the climate and movement of pollution, and the effect these fluid movements have on the ocean biosphere and make up of marine ecosystems. Both courses emphasize experiential learning where concepts are discovered through active learning in the classroom, innovative laboratory experiments and field trips to collect and interpret observations in the diverse ocean and atmospheric environments near Vancouver. Escape the classroom and discover with us!
No background knowledge of geology is required for this package.

Ocean and Atmosphere Systems
In this course you will assess and quantify the principal components of the global energy balance, how the energy balance affects the structure of the ocean and atmosphere and produces the winds and currents that control weather, air pollution and the biosphere. You will examine ocean productivity and the important geochemical cycles of carbon, nitrogen and phosphorous, and how over geologic time,

ocean and atmospheric processes coupled with the evolution of the life to regulate climate and climate change.

Marine Biodiversity

Students will explore the incredible diversity of marine ecosystems, and identify the factors that regulate ocean habitats and how marine ecosystems develop in response. Ecosystems' properties, including diversity, resilience (or lack of resilience) to environmental change and its impact on neighboring ecosystems will be considered. The fascinating marine ecosystems and habitats to be studied include hydrothermal vents, intertidal zone, coral reefs, estuaries, deep sea, and polar ecosystems. A particular emphasis will be placed on our beautiful and diverse local marine ecosystems. Examine the responses of ecosystems disturbances, the evolution of ocean plankton, invasive species, climate change and pollution.

Our emphasis is on active learning teaching methods where students are inspired to explore the subject matter through field trips, labs, discussions and in class activities.

No background knowledge of geology is required for this package.

Science – Integrated Sciences

Science IS Package A: Game Theory and Symmetry

Game Theory

Game theory is the study of mathematical models of conflict and cooperation between intelligent rational decision-makers. As such it is applicable to a wide range of behavioral relations, and is now an umbrella term for the science of logical decision making in computers and organisms. Game theory has been widely recognized as an important tool in many fields including computer science, biology, economics, political science and psychology. In this course we will consider representations of games (normal, extensive, and characteristic-function forms), game types (cooperative/non-cooperative, symmetric/asymmetric, zero-sum/non zero-sum, simultaneous/sequential, etc.), history, awards, and game theory in popular culture.

Symmetry

The mathematic definition of symmetry is that an object is invariant to various transformations; including reflection, rotation, or scaling. Mathematical symmetry may be observed with respect to spatial relationships, through geometric transformations and other kinds of functional transformations, with respect to the passage of time, as an aspect of abstract objects, theoretic models, music, and language. Symmetry in everyday language refers to a sense of harmonious proportion and balance. In this course we investigate symmetry and asymmetry in mathematics, physics, chemistry, and biology, and in the arts, specifically architecture, fine art, and music.

Science IS Package B: Science and Medicine

Evolutionary Medicine

Evolutionary or Darwinian medicine is the application of modern evolutionary theory to understanding health and disease and focuses on the question of why evolution has shaped molecular and physiological mechanisms in ways that may leave us susceptible to disease. The evolutionary approach has driven important advances in our understanding of cancer, autoimmune disease, and anatomy. In this course we will use the Darwinian theory of natural selection to explore explanations of cancer, allergies, infectious diseases, mental illness, and other human diseases.

Scale and Measurement in Science and Medicine

Measurement is fundamental to science. In medicine measurement underpins most clinical decisions. In this course we will use the unifying theme of size to study a number of systems. We will see that "size matters" whether we measure a tangible object or an abstract phenomenon, and that the geometry, kinematics, and dynamics of phenomena are largely determined by the relative reliability and validity of the size of the underlying factors and processes. Examples will be taken from the instructor's research in neurology and psychiatry. In addition, we will explore a set of general scaling laws using conceptual, graphical, and mathematical tools.