UBC Vancouver Summer Program
June 6 – July 6, 2020
Course Package Offerings

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 meet the minimum number of students will not be offered, but students may transfer to other packages.

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The most current information on course packages is on vancouversummerprogram.ubc.ca
Applied Science – Electrical and Computer Engineering

Package A – Introduction to Electrical and Computer Engineering (ELEC A JUNE)

Introduction to Digital Technology and Smart Devices
New products (smart-home devices, portable electronics, cars, appliances) are getting more intelligent and more connected. Do you ever wonder what technology lies behind them? This course covers the fundamental ideas behind smart devices and modern electronics. We will study the building blocks of digital electronic systems, including small microcomputers, and how they interface with us. Our exploration will involve the design and implementation of machines that can read signals from the real world and make decisions digitally. This course will introduce the basics of microcontroller programming to perform smart tasks; additionally, it will cover how different peripherals and sensors are used to communicate, and how the information they collect is stored. Regardless of your background, if you are interested in the world of modern electronics, this course is for you!

Introduction to Electric Circuits, Sensors, and Power
You need more than a digital system and basic programming to make your electronics work -- you need to understand electricity, sensors, and what it takes to bring everything to life. In this course, the basics of electricity and electrical circuits will be covered. You will learn about circuit fundamentals, amplifiers, and filters, which allow us to recover signals from devices such as microphones. Our look into sensors will allow us to detect physical magnitudes (like light, sound, pressure, color, temperature, and speed) and turn them into electrical signals that our microcontroller can understand. Finally, we will explore the circuits that give power to our electronics and bring them to life. Along with an introduction to digital electronics, this course will allow you to build simple systems to develop and interface with electronics systems.

Package B - Renewable Energy and Power Conversion (ELEC B JUNE)

Introduction to Renewable Energy
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 – Mechanical Engineering**

**Package A – Robotics and Challenges from Computational Intelligence (MECH A JUNE)**

*Introduction to Robotics*

Introduction to Robotics will provide an overview of common robotic devices and their classifications, and discuss industrial and home robotics applications. Major technical challenges in robotics will be considered, including dynamics related to trajectory and path planning. Through lectures, group activities, and hands-on lab work, students will explore both how robots sense their surroundings and gather information, and how they can interact with their environment. Although this course is technical in nature and will include a hands-on component, no experience in robotics is required. Knowledge of programming is encouraged in order to follow the material.

*Roboethics: Challenges from Computational Intelligence*

This seminar-style course will provide students with an awareness of the current state of thinking of the design of robots that are meant to co-exist with people (service, therapy, military, sentry, etc.). The course will provide insight into how sociology, psychology, law, literature and design can contribute knowledge to arrive at a safe and effective co-existence between humans and machines that have some autonomy from their computational intelligence, i.e., robots. The course will examine the taxonomy of collaborative robots, the underpinnings of bioethics applied to technology, and several controversial robot application areas.

**Architecture and Landscape Architecture**

**Package A - Thinking by Design (ARCH A JUNE)**

*Design Thinking Through Making*

The built environment is full of design problems. From products to cities, these problems do not have correct answers, but rather a range of possible solutions. To tackle these design problems, we need to explore different ways of thinking. In this hands-on course, students will learn to approach open-ended problems through the lens of a designer and explore the built environment through hands-on design projects. Students will tackle each project in stages, from initial concept to final result, with interim reviews along the way. They will learn to communicate their ideas both verbally and to critically analyze the work of classmates.
examples in architecture, landscape architecture, urban design and product design, students will cultivate abstract thinking skills and increase their visual literacy.

*Design Thinking Through Drawing*
Drawing is an essential part of design thinking and communication. From sketches, to plans, to detailed diagrams, visual representation is a fundamental skill. While digital methods are increasingly common, the culture of putting pencil to paper is still at the heart of these techniques. This hands-on course introduces you to the drawing techniques used in architecture, landscape architecture, and urban design. Through lectures, field trips and in-studio sessions, students will learn methods of visually communicating concepts and intent. With a focus on analog, the skills developed in this course will offer a strong base for further studies in design and design media.

**Arts**

**Package A - From Stage to Screen: How Vancouver ‘plays’ to a Global Audience (ARTS A JUNE)**

*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 and 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.

**Package B - Global Journalism, Culture, and Communications: Practice and Principles (ARTS B JUNE)**

*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
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With the advent of open data movement, knowledge and skills for collecting and analyzing big data become increasingly important for urban planners. This course will teach you how to harness the power of big data by mastering the way they are collected, organized, and analyzed to support better decision making in urban planning context. You will learn the basic tools needed to manipulate large datasets derived from various open-data platforms, from data collection to storage and approaches to analysis. You will capture and build data structures, perform SQL and basic queries in order to extract key metrics and insights. In addition, you will learn how to use open-source programming tools, such as R and Python, to analyze and visualize the data. These statistical tools and methods will be complemented by machine learning and pattern detection techniques, in addition to new technologies for big data.

**Spatial Analysis Using Geographic Information Systems**
GIS technology sits at the intersection of the world around us and our incredible computing capabilities that allows us to investigate and visualize that world in new and exciting ways. This course will introduce you to key concepts, methods, and tools used to collect, analyze, map, and visualize geospatial data. You will explore what makes spatial data special, some of the ways it is collected, and how it can be used to answer questions about the world around us. You will use geospatial data to help with decision making and to inform policy-making. You will use computer-based geographical methods of data input and analysis to model the world around them, to explore real-world scenarios, and present their findings to others. Practical applications will be investigated in both the natural and human realms through lectures, discussions, group exercises, and a hands-on computer lab component.

**Package B - Citizen-Government Collaborations for Creating Better Cities: The Vancouver Experience (PLAN B JUNE)**

**Case Studies of Citizen Participation in Significant Urban Projects**
This course introduces students into how Vancouver’s citizens and civil society organizations have collaborated with elected officials and city administration on policies and programs to create a more equitable, inclusive and livable city. Leaders and volunteers from community groups that have influenced change in environmental, social and economic sphere will show how they have contributed to such benefits as improved transportation infrastructure for cyclists and pedestrians, expanded accessibility in public facilities and housing design for people with disabilities, enhanced public spaces and parks, increased protection for heritage buildings, and broadened recognition of the contributions of minority groups and new immigrants to the vitality and economic of the city. The course will include visits to significant urban sites and interactive classes in the working spaces of community groups. This course will appeal to students with a wide range of interdisciplinary backgrounds.

**Smartphone City: Using Digital Techniques to Record and Publicize Vancouver’s Development Milestones**
This course will introduce students to the basics of short-video production using just their smartphones. Teams of students will shoot and edit 5-to-7-minute videos of specific, well-known cases studies in real-estate development, economic development, infrastructural planning, urban design, and social planning that represent milestones in the history of the City of
Vancouver. On field trips, students will visit specific Vancouver sites, interviewing key stakeholders, and conducting archival research with a view to building short, engaging, digital stories that raise questions about how communities engage with city authorities, and how to visualize and present ideas convincingly in the visual medium. Along the way, students will experience Vancouver’s museums, sample its foods, and understand the history of its social fabric and architecture. The course will presume no prior knowledge of filming and editing and is focused on developing introductory skills.

**Education**

**Package A - Teaching and Learning English (EDU A JUNE)**

*Applied Linguistics for 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.

**Package B - Early Childhood Education and Development (EDU B JUNE)**

*Designing High Quality Programs 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.

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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.

Land and Food Systems
Package A - Nutrition and Healthy Eating (LFS A JUNE)
Essentials of Nutrition
In this introduction to nutrition course, 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 are explored. Key concepts are emphasized through field trips to local food production and retail outlets and are an integral component of students' learning experiences. Upon completion of the course, students will be better equipped to sort out fact from fiction by applying their knowledge of nutrition to everyday scenarios and to their personal dietary choices.

Healthy Cooking and Eating in Canada’s Multicultural Context
This course will focus on applying the nutrition concepts learned from Essentials of Nutrition. You will be enriched with hands-on cooking experience, tasting and discussions about food choices. You will learn fundamental cooking skills and how to modify recipes for better health. Students will work in small groups to prepare a wide variety of foods from the many cultures making up Canada’s cultural mosaic. The instructor, a Registered Dietitian and Chef, will guide students in their cooking, help them explore the nuances of tasty foods they have prepared and lead discussions on how to ensure food is both delicious and healthy. Upon completion of the course, students should be able to demonstrate an understanding of fundamental knowledge and skills of food safety, the practical outcomes of recipe modification, an understanding of the role and interactions of ingredients in food preparation, and a variety of preparation techniques and their nutritional attributes.

Package B - Agribusiness Management (LFS B JUNE)
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

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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.

**Medicine**

**Package A - Introduction to Clinical Medicine and Scientific Research in the Hospital Setting**

*MED A JUNE*

**Introduction to Clinical Medicine in the Hospital Setting**

In this number 1 choice by VSP Medicine students in the last 5 years you will visit a large hospital and see the active life of physicians in several specialties as they diagnose and treat patients. Explore a unique hands-on experience and visit the Emergency Room, Laboratories and other areas. Learn how to resuscitate patients in cases of emergency, and use quality simulators to do intubation, defibrillation, managing airways and intravenous lines. Learn how to take history and conduct a physical exam – and work with physician-educators to acquire skills that focus on cardiac, respiratory and neurological systems. Discuss hospital cases in a wide spectrum of diseases, present patient cases of acutely ill and injured patients such as those with a myocardial infarct or car accidents, as well as chronically ill patients such as those with rheumatoid arthritis. In small group learning style discuss common emergency complaints such as fever, abdominal pain and rash to learn foundation of medicine.

**Introduction to Scientific Research in the Hospital Setting**

Review the scientific basis for research in biology, pharmacology and disciplines of medicine and explore methods to learn advanced clinical (hospital and clinic based) study designs. Learn from senior doctors, investigators and scientists how to discover better treatments for severely ill patients and acute emergencies, discuss ethical conduct of studies in children and neonates, how to recruit patients and what can be done to improve patient care through scientific studies. The course is providing students with solid foundation to appraise primary literature in clinical disciplines including medicine.

This course was oversubscribed for 5 years because it offers you exposure to senior and experienced doctors who do such research in a large hospital. Learn to read English medical literature and have an opportunity to discuss research opportunities in cases of emergency, chronic diseases and cancer. With other students and a doctor-mentor in a small group you will develop a research proposal that can be implemented in the future.

**Package B - Community Health Care and Living with Long-Term Conditions in Canada**

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(MED B JUNE)

Introduction to Rehabilitation and Living with Physical Disabilities in the Community
The World Health Organization has identified a critical need for comprehensive health and social programs to address the "global burden" of chronic illness & disability. This course explores long-term conditions and their effect on participation in everyday life. Learn from Canadian occupational therapy researchers, clinicians, students and clients living with disabilities. Sessions take place in the community, class room and clinical settings. This interactive, case-based curriculum includes topics related to health, illness & disability, the social determinants of health, and populations living with mobility impairments. Sessions include practical training in wheel chair skills, accessibility and universal design.

Introduction to Community Rehabilitation for Mental Health and Invisible Disabilities
Building on Course 1, students are introduced to rehabilitation assessments and interventions for managing invisible, long-term conditions in the community. This includes supporting the recovery of adults with mental health issues & addictions, assessing & managing pain, and hi-tech and lo-tech strategies for living with visual impairment. Class room sessions use cases, social media and workshop format to tap creativity and apply the principles presented. Community based sessions enable students to integrate their learning by assessing real-life Canadian situations. The instructional team includes researchers, occupational therapists and clients living with life long conditions.

Package C - From Conception to Life Saving Surgery Across the Life Span (MED C JUNE)

Introduction to Women’s Health: Normal Physiology and Clinical Challenges
Students will be introduced to the subject of human reproduction and women’s reproductive health over the life span. The course will cover both foundations of physiology and clinical aspects of care. Embedded Case-based learning (CBL) cases will provide insight into the biology and physiology of reproduction from embryonic development and conception, pediatric gynecology, to menopause and cancer. Teaching will be provided by scientists as well as clinicians.

This interactive course will highlight the many advances in this specialty. A tutorial on how to use technology to access the most relevant literature to solve a problem will be presented.

A wide exposure to common clinical challenges in the field will be achieved through didactic lectures augmented by student led presentations using CBL. Teams of students will be tasked with a clinical scenario to research and present to their fellow students at the end of each course. Hands on learning will be provided in sessions.

The Speciality of Obstetrics and Gynecology: From the Bench to the Bedside
This module builds upon the foundations of the first course and provides a deeper and more comprehensive exploration of this speciality. It will incorporate exposure to leading edge research and clinical facilities with visits to different world class laboratories, a tour of a fertility
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Clinic laboratory and some hands-on learning in a surgical training laboratory at the Centre of Excellence for Simulation Education and Innovation (CESEI).

Students will expand their knowledge and further understanding of subspeciality medicine in Women’s Health/Obstetrics and Gynecology with lectures from areas such as Reproductive Endocrinology, Gynecological Oncology, Pediatric Gynecology, Maternal Fetal Medicine, Urogynecology, Sexual Medicine, Infectious disease, Neonatology and so forth.

Package D - Genomics and Genetics in Healthcare (MED D JUNE)
Genetics and Genomics at the Intersection of Society, Ethics, and Healthcare
This course provides foundational knowledge of genetic and genomic applications in healthcare. Students will be introduced to the key concepts of test interpretation and test utility, including the value, limitations and applications of different types of genetic tests across a range of disorders. Working independently and in small groups, students will be able to utilize an objective lens to analyze genetic information from a variety of sources including direct to consumer websites. Building on this knowledge, students will gain insight into the lived experience of patients and families living with certain genetic conditions, and explore the potential impact of genetic testing across family members. Students will apply this knowledge to debate either side of classic controversial issues in medical genetics and will be able to critique the ethical, familial and societal impacts of genetic testing.

Approaches to Genetic Disorders from a Genetic Counselling Perspective
This course builds on the foundations learned in course A, as the students apply their knowledge to an in-depth examination of 4 different disorders with a genetic component from the genetic counselling perspective. Working first independently and later as a group, students will be asked to consider clinical, familial, psychosocial and societal implications for genetic testing and screening as they work through online cases on Down syndrome, phenylketonuria, and bipolar disorder. Cases are presented from an interprofessional, multidisciplinary perspective in order to build an understanding of the varied roles and responsibilities of health care professionals across the continuum of care. Working in small groups, students will select a disorder of their choosing and present their case example to the class for group learning and discussion.

Science – Institute for Resources, Environment and Sustainability
Package A - Food for a Healthy and Sustainable Planet (IRES A JUNE)
Sustainable Food and Farming Systems
Our food and farming systems are one of the greatest causes of global environmental problems. Agriculture covers a third of the world’s land, and is responsible for continued deforestation, biodiversity loss, greenhouse gas emissions that cause climate change, depletion of freshwater...
resources, and water pollution. This course provides an overview of global agriculture (what does the spatial distribution of crops and livestock, irrigation and fertilizer use, look like), its historical evolution, environmental consequences, socio-economic dimensions (who/where are farmers, land tenure, labour, food sovereignty, right to food, access to food), and some proposed solutions for addressing these challenges. We will cover topics such as the Green Revolution, sustainable intensification, organic farming, agroecology, genetically modified foods, smallholder systems, and supply chains. Assignments that use data science to understand and find sustainable farming solutions will also be included.

**Sustainable Diets and Nutrition**

Despite rapid growth in cereal production over the last 50 years, hunger and malnutrition persist. It is estimated that nearly 1 in 7 people today remain undernourished, while 2 billion are malnourished (which includes obesity and micronutrient deficiencies, in addition to undernourishment). A nutritious diet is critical to raising the quality of life of a large section of the world’s population. At the same time, decreasing consumption of meat-intensive foods is being seen as solution to reducing the environmental footprint of our food system. This course will explore what a healthy and sustainable diet means. It will touch on concepts such as calories versus nutrition, dietary diversity, dietary trends, macro vs micro nutrients, vegetarian/vegan diets, fad diets, food safety, and the relationship between diets, human health, and planetary health. It will investigate the role of dietary shifts as a critical pathway toward meeting the UN Sustainable Development goals.

**Package B - Sustainable Futures (IRES B JUNE)**

**Nature Matters: Ecology, the Environment and You**

Ecosystems and the benefits they provide to people lie at the heart of many sustainability issues (such as food security, energy production, corporate environmental responsibility, and resource management), in ways not often reflected by management and policy approaches. This course will explore human impacts on ecosystems, the processes by which ecosystems render benefits for people (ecosystem services), methods for analyzing impacts and benefits, and the ways that individuals and organizations incorporate such information into their decision-making. Through field trips to a range of ecosystem types, lectures, and exposure to innovative organizations in the public and private sector, this course will consider the opportunity for innovative progress towards sustainability from stronger and deeper ecological grounding, and how students can support this type of progress in their careers and day-to-day lives.

**Oceans in the 21st Century**

This course provides an overview into ocean conservation issues, including the integrated and often conflicting role of oceans in biodiversity conservation, food security, climate change, and ecosystem services to humans. The course includes lectures and field trips that cover a variety of ocean issues, as well as guest lectures from and/or visits to organizations that are tackling components of these challenges in a variety of ways. Simulations and workshops will help students consider the variety of stakeholders involved in decision-making. Content, discussion, and exposure to experts and innovative research and strategies will equip and empower students.
students to better understand and become more engaged in ocean issues, no matter how close they are to a coast.

Science – Integrated Sciences
Package A - Game Theory and Symmetry (ISCI A JUNE)

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.