

UBC Vancouver Summer Program

July 16–August 16, 2016 Course Package Offerings

Final set of package offerings will be available at: <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. For further information, please visit our website at vancouversummerprogram.ubc.ca or contact us at:

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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 Research 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,



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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

Pharmacology through Case Studies (Anesthesiology, Pharmacology & Therapeutics)

An integrated approach to learning pharmacology through the use of simulated clinical cases specifically designed to highlight the fundamental principles. Knowledge acquisition will be supported through complementary lectures and small group exercises. Through this educational model, students will explore the basic science and clinical applications of cardiovascular, respiratory, gastrointestinal, reproductive and endocrine pharmacology, and their integration with other core areas of study within the curriculum.

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

This course will empower students from both clinical and basic science programs with an understanding of the scientific method, providing the foundation needed to adequately review and assess primary literature in any biomedical discipline. Through small group exercises, discussions and critical analysis of published literature, students will develop valuable skills in recognizing how confounding factors such as bias, inadequate study design and poor statistical analysis may (intentionally or not) impact the underlying science. The resulting downstream consequences of poor experimental design and interpretation of results in informing (or formulating) evidence-based medicine will also be explored.

2

Medicine Package C: Medical Imaging and Anesthesiology

Introduction to Medical Imaging (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'.



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Anesthesiology

(Anesthesiology, Pharmacology & Therapeutics)

This course will explore applied pharmacology and physiology as it pertains to the practice of anesthesiology. Students will gain an appreciation of the role of analgesia and anesthesia throughout history and in present-day society. Classes will be a mix of academic and clinical instructors, providing perspectives on general and regional anesthesia, as well as pain management – acute and chronic. Course objectives will be met through a combination of lectures, small group discussions and tutorial sessions, as well as utilization of high fidelity computer-simulation, task trainers and ultrasound to demonstrate how modern anesthesia is provided and how emergencies in the operating room are practiced.

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

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



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biochemistry background can expect a higher workload compared to students with previous biochemistry knowledge.

Note: Courses in Packages E through to G will have the format of lecture or seminar-based teaching, followed by presentation and discussion of specific clinical cases.

Medicine Package E – Origins of Illness and Psychotherapies

A Life Cycle Approach to Mental Illness **(Psychiatry)**

Mental illness causes significant morbidity world-wide; many serious disorders have their origins before adult life and many distinctive childhood onset disorders persist into adult life. This course will provide an evidence-based description of the causes and mechanisms underlying the major psychiatric disorders of childhood. The roles of brain and cognitive development and maturation will also be applied to understanding psychiatric disorders in adults and in old age. Prof. Anthony Bailey, Dr. S. Evelyn Stewart and other faculty members will be the lecturers for this course.

Introduction to Psychotherapy **(Psychiatry)**

This course will provide an introduction to the foundations of psychotherapy. Topics will include assessment of readiness for therapy, and a description of psychotherapy models and modalities including cognitive-behavioural, mindfulness-based, and supportive psychotherapies. Prof. John Ogrodniczuk, Head, Division of Psychotherapy in the Department of Psychiatry, and other faculty members will be the lecturers for this course.

Medicine Package F – Major Mental Illness and Pharmacology

Mood Disorders and Psychosis: Assessment and diagnosis **(Psychiatry)**

Disorders of mood such as major depression and bipolar disorder, and of impaired reality testing (psychosis) such as schizophrenia and schizoaffective disorder will be the topic of this course. These illnesses cause significant, and growing disability in all countries. Detection and assessment of mood disorders and psychosis, and accurate differential diagnosis will be the focus of this course. The epidemiology and mechanisms of illness will also be covered. Prof. Raymond Lam, Dr. Fidel Vila-Rodriguez and other faculty members will be the lecturers for this course.

Introductory Neuropsychopharmacology **(Psychiatry)**

This course will cover drugs used in the treatment of the major psychiatric disorders. Over the duration of the course, we will briefly review the symptoms and neurobiology of psychiatric disorders, and then explain in detail how drug therapies work to improve mental health. The pharmacology of these drugs will be studied at both the molecular level and from a clinical perspective. Practical approaches to the pharmacological treatment of the major mental illnesses including schizophrenia, mood disorders (depression and bipolar disorder), and substance abuse disorders will be incorporated. Prof. Ric

UBC Vancouver Summer Program

July 16 – August 16, 2016

Course Package Offerings

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Procyshyn from the Department of Psychiatry will be a lecturer along with Dr. Alasdair Barr from the Department of Anesthesia, Pharmacology and Therapeutics.

Medicine Package G – Neuroscience and Clinical Neuropsychiatry

Translational Neuroscience

(Psychiatry)

This course will cover the molecular and cellular aspects of neuroscience important to understand the origins, clinical features, and treatment of major brain disorders. This course offers the necessary foundation to pursue related fields of study such as neurology, pathology, pharmacology, and psychiatry. Prof. Weihong Song, Head, Division of Neuroscience in the Department of Psychiatry, will be the central lecturer for this course.

Introductory Neuropsychiatry

(Psychiatry)

This course will cover the anatomical and physiological basis of major mental disorders, focusing upon organic mental illnesses. A neuropsychiatric perspective will include the key features in the history, physical examination, and mental status examination related to the diagnosis of mental disorders in general and organic mental disorders in particular. Prof. Trevor Hurwitz, a psychiatrist and neurologist, from the Department of Psychiatry will be the central lecturer.

Medicine Package H -- Introduction to Population and Public Health

What is 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 developing preventative approaches to improve health. These are important topics for those interested in careers in medicine or health sciences. UBC is recognized as a world leader in this area. 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)

The first course addresses the question of understanding what affects population and public health. It is generally accepted that a variety of factors (e.g. social, economic and physical environments, personal health practices, individual capacity and coping skills, human biology, early childhood development, culture, gender and health services) influence health. What are the most important influences? By what mechanisms is health damaged or promoted? How are these factors influenced by public policy? This course focuses on the meaning of health and its measurement, and examines what influences the health, well-being and quality of life of individuals, families, communities and nations.

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July 16 – August 16, 2016

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Introduction to Population and Public Health Practice

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 evaluation of the cost and effectiveness of activities will also be considered.

Medicine Package I – 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 conditions. Through an exploration of chronic conditions such as arthritis, cancer, cognitive impairment and cardiovascular disease, students 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 also complete hands-on labs in a state-of-art fitness and exercise research facility designed to enable access for people with chronic disease and disability.

Recovery from Injury

This course will introduce students to the science of rehabilitation within the World Health Organization framework. 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. 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 robotic suits to permit walking after spinal cord injury and e-Health (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.



UBC Vancouver Summer Program

July 16 – August 16, 2016

Course Package Offerings

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Medicine Package J – Medical Laboratory Science

Introduction to Medical Laboratory Science

(Pathology and Laboratory Medicine)

Students will learn to interpret the results of selected clinical laboratory tests in the context of medical cases. Course content will focus on the normal and abnormal biochemistry and physiology of blood and of organ systems including the liver, gastrointestinal tract, and kidneys. Students will apply this course content to solve case studies and diagnose disease by interpreting patient history information, physical findings, and results of clinical laboratory tests. In addition to interactive lectures, discussions and case-based learning in groups, there will be a hands-on blood cell morphology laboratory session in which students prepare and stain blood smears and learn to distinguish different blood cells under the microscope. Students will also take guided tours of clinical or clinical research lab facilities and of the David Hardwick Pathology Learning Centre which houses tissue specimens representing a wide range of pathological conditions.

Fundamental Techniques for Clinical and Medical Research Laboratories

Course content will focus on methods that are commonly used in hospital and bio-medical research laboratories. Hands-on laboratory sessions, conducted in the UBC Hospital, will be the predominant learning experience and will promote the development and advancement of students' technical laboratory skills. The learning focus will be on three disciplines. In the molecular biology section, students will extract and analyze their own DNA. In the histochemistry section, students will conduct a series of experiments using different staining techniques to microscopically determine the composition of unknown tissues. In the cell culture section, students will culture a mammalian cell line using aseptic techniques and identify sources of contamination. Demonstrations, discussions of experimental design, data analysis activities, and interactive lecture sessions will also be used to support students as they achieve the course learning objectives.

7

Medicine Package K – Anatomical Sciences

The courses will build the foundation for entrance into a postsecondary program in life sciences and build interest in health sciences. Learning will be achieved through a blended learning approach incorporating online learning with lectures tailored to the students, and small group learning. Students will be able to understand the basic principles of anatomy and learn to apply their knowledge and express their ideas in class discussions.



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July 16 – August 16, 2016

Course Package Offerings

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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

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.

