

THE UNIVERSITY OF HONG KONG
SCHOOL OF PUBLIC HEALTH

Major / Minor in Exercise Science

Course description

(for students admitted to HKU in the academic years 2012-13, 2013-14, 2014-15 and 2015-16)

EXSC1001 Foundations of Exercise Science (6 credits)

Exercise Science is a multidisciplinary field of study encompassing an array of disciplines that contribute to our understanding of human movement. This course will introduce and expose students to the sub-disciplines of exercise science including anatomy, physiology, biomechanics, nutrition in addition to the psychosocial aspects of human health and performance. Theoretical and practical learning in each of these sub-disciplines will be combined with professional awareness and career prospects in the area of exercise and sport science.

Assessment: 100% coursework

EXSC1002 Physical Activity and Health (6 credits)

This course will investigate the role of exercise, physical activity (PA), inactivity and sedentary behaviour in health and wellness, with particular emphasis on the role of exercise and physical activity in the prevention and treatment of major non-communicable diseases (NCDs). Key terms relating to PA will be defined. Various PA measurement methods and their use in PA epidemiology and public health research will be discussed. Students will learn about fundamental study designs and methodologies used in evaluating the impacts of PA on health. Students will obtain skills and knowledge necessary to critically evaluate evidence on health benefits of PA. Students will learn whether the beneficial impacts of PA on health outcomes are independent of, or modified by other health risk factors, such as obesity, sedentary behaviour and genetic risk.

Pre-requisite: EXSC1001 Foundations of Exercise Science
Mutually exclusive: EXSC2008 Physical and Health Benefits of Exercise

Assessment: 100% coursework

EXSC1003 Kinetic Anatomy (6 credits)

This course provides an introduction to the gross anatomy of the human body, with an underlying emphasis on anatomy for human movement. Areas covered usually include the tissue types, the anatomical referencing system, the axial and appendicular skeleton, important nerves, blood vessels and skeletal muscles, and an overview of the heart, lungs and viscera.

Pre-requisite: EXSC1001 Foundations of Exercise Science
Assessment: 30% coursework; 70% examination

EXSC1004 Physiology for Human Movement (6 credits)

The course is designed to provide students with an understanding of the underlying physiological processes enabling human movement. Topics normally covered include nutrition and energy, skeletal muscle function, neural control of movement, cardiovascular function, respiratory function and endocrine function.

Pre-requisite: EXSC1001 Foundations of Exercise Science

Assessment: 20% coursework; 80% examination

Remark: This course is replaced by BBMS1001 with effect from the 2016-17 academic year

BBMS1001 Human Biology (6 credits)

This course examines the concepts related to the structure and function of the human body, including the organization of the body from single cell to the coordinated whole. Throughout the course, focus will be placed on the inter-relationship between structure and function in cells, tissues and body systems (cardiovascular, respiratory, digestive, renal, musculoskeletal, neural, immune, and endocrine systems). The course serves as a basis for understanding the normal processes of life.

Pre-requisite: HKDSE Biology or Chemistry or Combined Science with Biology or Chemistry component, or equivalent

Assessment: 40% continuous assessment; 60% examination

Remarks:

- 1. This course is equivalent to EXSC1004.*
- 2. Course pre-requisite requirement is waived for BSc(Exercise&Health) students.*
- 3. This course is replaced by BBMS1002 with effect from the 2018-19 academic year*

BBMS1002 Fundamentals of Human Anatomy and Physiology (6 credits)

This course provides the basic concepts related to the structure and function of the human body, including the organization of the body from single cell to the coordinated whole. Particularly, the course will focus on the body systems that respond to physical exercise, including cardiovascular, respiratory, renal, musculoskeletal, neural, and endocrine. The course serves a basis for understanding the normal processes of life. In addition, the course will describe how different tissues are organised to perform the essential physiological functions in human body.

Assessment: 40% continuous assessment; 60% examination

Remarks: This course is equivalent to BBMS1001

EXSC2001 Fundamentals of Motor Control and Learning (6 credits)

Human movement is a highly complex process. Simply negotiating your way to lectures requires the processing of a host of sensory information, effective decision making, and the coordinated contraction and relaxation of skeletal muscles. This course offers an introductory overview of how we control movement and how we develop and refine our movement skills. Emphasis is placed on basic principles of human movement and their application to health and exercise.

Assessment: 100% coursework

EXSC2002 Sport and Exercise Psychology (6 credits)

This course primarily looks at the psychological aspects of exercise and health behaviours. The content will cover different models of psychology that have been used for explaining and intervening exercise and health behaviours among diverse populations. In addition, the course reveals the role of exercise and physical activity on mental health/illnesses and psychological well-being. Students will explore the assessment and research methods of psychology to evaluate psychological factors of exercise and health behaviours. Mental skills training and counselling techniques useful for fostering behavioural adherence towards exercise and other health enhancing behaviours will be demonstrated. Students will be given opportunities to develop evidence-based behavioural change strategies and intervention programmes based on psychological principles for the promotion of physical activity and health behaviours.

Mutually exclusive: EXSC3015 Sport and Exercise Psychology,
EXSC3016 Psychology of Exercise and Health

Assessment: 100% coursework

EXSC2003 Exercise Physiology (6 credits)

This course will introduce the key physiological and metabolic responses to acute and chronic exercise. Students will examine and evaluate physiological changes that occur to respiratory, cardiovascular and musculoskeletal systems during an acute bout of exercise and following a period of exercise training. The physiological basis of anaerobic and aerobic training and muscle training will be discussed. The environmental factors such as temperature and altitude that affect the responses to exercise will also be discussed. Students will participate in practical sessions held in the exercise physiology laboratory to assess their own anaerobic power, aerobic capacity, and isokinetic muscle strength.

Assessment: 100% coursework

EXSC2004 Research Design and Analysis for Exercise and Health (6 credits)

This course introduces students to the common research design and statistical methods used in exercise sciences. It also provides practical experience in describing and analyzing data using the statistical package for the social sciences (SPSS).

Assessment: 60% coursework; 40% examination

Remark: This course is replaced by BBMS2002 with effect from the 2017-18 academic year

BBMS2002 Evidence-based Practice and Public Health (6 credits)

Evidence-based practice, the overarching principle of all health professions, is premised on the sciences of epidemiology and biostatistics. A solid foundation in evidence-based practice is needed to guide public health decisions. This course is for BBiomedSc, BPharm and BChinMed students with key components of epidemiology, biostatistics and public health. Biostatistics will emphasize application and interpretation, with concepts mostly integrated into epidemiology; technical calculations will be minimal. Students will be able to make sense of data, and appraise scientific evidence through an understanding of basic epidemiologic and statistical concepts. These concepts include hypothesis testing, P value, confidence interval, probability, measures of the distribution and determinants of disease, vital statistics, reliability, validity, bias, confounding, interaction, causality, and common epidemiological study designs. These serve as a foundation to understanding subsequent public health topics such as sociology of health, chronic illness and disability, global burden of disease, health promotion, health care system, health policy and health economics.

Assessment: 30% continuous assessment; 70% examination

*Remark: 1. This course is equivalent to EXSC2004.
2. This course is replaced by BBMS2011 with effect from the 2018-19 academic year*

BBMS2011 Research Methods in Medicine and Health (6 credits)

This course introduces students to a comprehensive set of knowledge and practical skills necessary for understanding, appraising, and conducting clinical research. Students will start by examining the epistemological basis of scientific inquiry and its evolution, and begin formulating relevant research questions within an empirical framework. Students will then be introduced to different approaches to answer research questions, including major epidemiologic study designs and qualitative methods, and will learn about important considerations when conducting research, including ethics, survey design, and data management & analysis. Finally, students will move past learning about the “doing” aspect of research and focus on developing skills related to interpreting and communicating results from studies.

Assessment: 60% continuous assessment; 40% examination

Remark: This course is equivalent to BBMS2002

EXSC2005 Biomechanics (6 credits)

Biomechanics is the area of exercise science concerned with the application of mechanics to the study of human movement. Biomechanics is traditionally divided into sub-areas of kinematics – the analysis of the movements of the body – and kinetics - the analysis of the forces associated with the movements of the body. This course offers an introduction to basic biomechanical principles and shows how these principles can be applied to the analysis of simple and more complex human movement.

Assessment: 30% coursework; 70% examination

EXSC2006 Measurement of Physical Activity (6 credits)

The course aims to develop an understanding of how different aspects of physical activity are assessed. The primary focus of the course is on the objective measurement of physical activity and key areas covered include the measurement of energy expenditure, as well as cardiopulmonary and mechanical responses to physical activity of varying intensities.

Assessment: 60% coursework; 40% examination

Remark: This course is replaced by EXSC2010 with effect from the 2019-20 academic year

EXSC2007 Exercise Prescription and Training (6 credits)

This course will introduce the theoretical constructs underpinning exercise prescription and training and equip students with the necessary knowledge and skills to conduct basic pre-participation health screening, assess components of fitness and to design exercise programmes for apparently healthy individuals. This course is designed to prepare students for exercise professional accreditation, particularly in becoming an American College of Sports Medicine (ACSM) Certified Personal Trainer. Students will participate in practical sessions held in the fitness gym to undergo physical fitness testing and fitness training activities.

Assessment: 100% coursework

EXSC2009 Exercise Biomechanics (6 credits)

This course will introduce you to the basic concepts of mechanics on the structure and function of the human movement. You will develop an understanding of the mechanical principles and rules that are governing motion. Examples and case studies from real life will be used to enhance your understanding of how the laws of mechanics can be applied so as to contribute to maintaining the health or even the performance of the individual/athlete.

Assessment: 100% coursework

EXSC2010 Measurement and Evaluation of Physical Activity (6 credits)

This course will introduce students to the basic concepts, principles and applications of physical activity measurement and evaluation. Students will be able to describe advantages and disadvantages of various physical activity assessment tools. Moreover, students will learn about historical and new techniques needed to measure and evaluate physical activity. In addition, students will learn how emerging wearable technologies can be utilized under various applications to increase physical activity and decrease sedentary time. Students will also be able to apply various measurement techniques to evaluate the accuracy of physical activity assessment tools.

Assessment: 100% coursework

Remark: *This course is equivalent to EXSC2006*

EXSC3002 Advanced Exercise Physiology (6 credits)

This course will scientifically address the question “why exercise can result in the improvement of human health?” by providing an in-depth discussion on the latest discovered mechanisms that are responsible for the widespread health benefits of exercise, including the antioxidant, anti-inflammatory, anti-aging, anti-tumor, myokine/exerkine, cardioprotective, glucose-lowering and fat-beiging effects of exercise. This course will also explore the fundamental cellular and molecular mechanisms that underpin the physiological adaptations from exercise leading to the enhancement of human health.

Co-requisite: EXSC2003 Exercise Physiology

Assessment: 100% coursework

Remark: *This course is replaced by EXS3018 with effect from the 2019-20 academic year*

EXSC3003 Advances in Skill Learning (6 credits)

The course will introduce students to an in depth examination of both theoretical and applied aspects of skill learning. Students will trace the development of the field, from the early work in psychology and sport science through to contemporary developments in movement rehabilitation. A significant component of the course will be dedicated to experimental work, with students expected to develop and test empirically their own hypotheses.

Assessment: 100% coursework

EXSC3004 Physical Activity and Disability (6 credits)

The course will present both concepts and trends in the area of adapted physical activity, enabling students to become familiar with theoretical and practical perspectives on physical activity provisions and opportunities for people with disabilities. This course will also provide an overview of the relationship between physical/psycho-social health and physical activity in people with disabilities.

Assessment: 100% coursework

EXSC3005 Physical Activity and Diseases of Inactivity (6 credits)

Obesity is emerging as one of the greatest threats to world public health. Obesity and several other serious diseases (coronary heart disease, diabetes, osteoporosis and some cancers) all have one thing in common – they are associated with physical inactivity. This course will examine the physiological bases upon which physical inactivity leads to disease and evaluate the role physical activity plays in the prevention and treatment of lifestyle diseases. An introductory knowledge of physiology is highly recommended.

Assessment: 100% coursework

EXSC3006 Public Health Promotion of Physical Activity (6 credits)

This course primarily looks at how physical activity could be used as a tool for public health promotion, and the concepts and methods behind the utility of physical activity in public health settings. In this course, we will discuss about the distributions of physical activity and physical inactivity in the population, and whether or not the distributions are related to health and illnesses. Using research evidence, we attempt to scientifically evaluate the effectiveness of physical activity interventions, and review how the results may help inform national and international policy targeting physical activity promotion.

Assessment: 70% coursework; 30% examination

EXSC3007 Special Topics in Exercise Sciences (6 credits)

This course introduces the students into a current topic that is of special interest to the field of Exercise Sciences. The course focuses on a target article written by a leading expert in the field of exercise sciences. Instead of learning the facts, student will learn to form an educated opinion on the topic, both orally and in writing. To this end, students will conduct short literature searches to enhance their understanding of the key concepts that underlie the topic, may acquire specific data collection techniques and/or complete empirical data collection.

Assessment: 100% coursework

EXSC3008 Recent Advances in Exercise and Health (6 credits)

Students taking this course will be given an overview of recent advances in the field of Exercise and Health. The course will normally focus on one specialist area that will provide students with detailed learning opportunities that may involve combinations of lectures, seminars, labs, empirical data collection, student presentations and other learning experiences. When offered, the specialist area of this course may change from year to year.

Assessment: 100% coursework

EXSC3009 Current Concepts in Exercise and Health (6 credits)

This course introduces students to a current concept that is relevant to the discipline. Students will seek to develop their own opinion of the current concept by conducting an in-depth literature search, acquiring an understanding of the specific data collection and analysis techniques relevant to the concept and/or completing empirical data collection. Students are encouraged to choose a concept that aligns with their final year dissertation.

Assessment: 100% coursework

EXSC3010 Advanced Measurement of Physical Activity (6 credits)

The course develops a critical appreciation of the measurement of different aspects of physical activity. The course will present measurement within the context of a research project, with particular emphasis on current gold-standard means of data collection. Various measurement techniques and their application will be presented and may include the measurement of human movement, energy expenditure, muscle and neural function.

Assessment: 100% coursework

EXSC3011 Advanced Exercise Prescription and Training (6 credits)

The course provides students with an in-depth understanding of the essence of exercise prescription and training which includes knowledge of, and skill in, risk-factor and health-status identification, fitness appraisal, exercise programme design and implementation. Key areas covered include physical fitness assessments, interpretation of assessment results, exercise prescription and training in apparently healthy individuals, patients with chronic diseases and special populations.

Pre-requisite: EXSC2007 Exercise Prescription and Training

Assessment: 60% coursework; 40% examination

EXSC3012 Applied Anthropometry (6 credits)

This course introduces students to the theoretical and practical skills of anthropometry, the study of human body dimensions and composition. Students will aim to acquire practice and theoretical competency at the internationally accredited ISAK Level 1, and be able to apply this information to physical activity, health and dietary/nutrition-related situations.

Assessment: 70% coursework; 30% examination

EXSC3013 Sport and Exercise Nutrition (6 credits)

This course will introduce the basic principles of human nutrition and the functional role of nutritional components such as water/fluid, vitamins, minerals, carbohydrate, fat, and protein for health and exercise performance. Students will be exposed to appropriate nutritional practices that assist with weight loss and weight management and that positively influence exercise performance. Students will participate in learning activities to apply the sports nutrition knowledge in real-life scenario.

Mutually exclusive: EXSC3017 Nutrition for Exercise and Health
Assessment: 100% coursework

EXSC3014 Rehabilitation Science (6 credits)

This course will present both theoretical perspectives and applied aspects of rehabilitation science. Students will study human functional capacity as it relates to deficits of neuromuscular, cardiovascular and respiratory mechanisms that underlie functional disability. Emphasis is placed on the application of fundamental theoretical principles to enhance human performance and quality of life of persons with movement difficulties in dynamic environments.

Pre-requisite: Pass in any one of the following courses: EXSC2003 Exercise Physiology, EXSC2008 Physical and Health Benefits of Exercise
Assessment: 100% coursework

EXSC3018 Biological Basis of Exercise and Health (6 credits)

This course will address the question “why exercise can result in improvement of human health?” by providing an in-depth discussion on the latest discovered biological mechanisms that are responsible for the widespread beneficial effects of exercise on health, including the anti-inflammatory effect, antioxidant effect, myokines, cardioprotective effect, fat-beiging effect, glucose-lowering effect, anti-cancer effect, and brain health effect of exercise. This course will also explore the fundamental cellular and molecular mechanisms that underpin the physiological adaptations from exercise leading to the enhancement of human health. Students will participate in practical sessions held in the laboratory to assess their own body fat and glucose tolerance.

Assessment: 100% coursework
Remark: This course is equivalent to EXSC3002

EXSC3019 Exercise and Chronic Diseases

(6 credits)

Exercise and chronic diseases course will introduce you to the prevention, rehabilitation and management of the chronic conditions in which exercise can play a vital role. You will be able to understand the most effective way to change the behaviour of an individual regarding exercise and how to design safe and effective exercise programmes for individuals with chronic diseases. You will be exposed to clinical case scenarios with the primary objective to develop the skills in evidence-based practice.

Assessment: 100% coursework

EXSC4000 Dissertation

(12 credits)

The dissertation is a capstone requirement of the BSc (Exercise & Health) programme and is an opportunity for students to undertake a significant independent piece of research work; to build and demonstrate knowledge and research skills in a particular sub-discipline of physical activity and exercise science, and to show the ability for scientific communication, in an academic style of a journal article. Students taking the dissertation should have already completed a statistics course.

Assessment: 100% coursework
