Course description

Introductory Level Courses

**EXSC1001. Foundations of exercise science** (6 credits)

This course provides an introduction to exercise science as a field of study by providing an overview of (1) the sub-disciplines that provide the knowledge base for the discipline of exercise science and (2) the professions that depend on exercise science for their practice. Key biological themes related to adaptation and maturation will be used to exemplify the contributions that studies of the anatomical, mechanical, physiological, neural, and psychological and socio-cultural studies of human physical activity can make to human health and performance.

Assessment will be 60% coursework and 40% examination.

Note: This course is a pre-requisite for all introductory level and core advanced level courses of the curriculum (but NOT for advanced level disciplinary electives) and the Major / Minor in Exercise Science. Enrollment priority will be given to Year 1 and Year 2 undergraduates.

**EXSC1002. Physical activity and health** (6 credits)

This course investigates the role of physical activity in the maintenance of good physical health and avoidance of disease. The epidemiological evidence for physical inactivity as a causative factor in various lifestyle related disorders is introduced, and the use of physical activity and exercise as effective means of health management is investigated.

Pre-requisite: EXSC1001. Foundations of exercise science

Assessment will be 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 will be 30% coursework and 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 will be 20% coursework and 80% examination.
Advanced Level Courses

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 and their application to health and exercise.
Pre-requisite: EXSC1001. Foundations of exercise science
Assessment will be 70% coursework and 30% examination.

EXSC2002. Sport and exercise psychology (6 credits)

The course will introduce students to both theoretical and applied aspects of psychological phenomena in sport and exercise. Students will consider a broad range of topics that are key in the field, including unidimensional and multidimensional theories of stress and anxiety in performance, motivation and goal setting, team cohesion, cognitive control strategies and aggression, coaching practice and expert/ novice differences. An introductory knowledge of psychology is highly recommended.
Pre-requisite: EXSC1001. Foundations of exercise science
Assessment will be 100% coursework.

EXSC2003. Exercise physiology (6 credits)

This course provides an introduction to energy metabolism and the changes that occur in response to physical exercise. Emphasis is placed on the respiratory, cardiovascular and muscular systems, and the principles of exercise testing and prescription. Introductory level knowledge of physiology and biochemistry would be an advantage.
Pre-requisite: EXSC1001. Foundations of exercise science
Assessment will be by 30% coursework and 70% examination.

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).
Pre-requisite: EXSC1001. Foundations of exercise science
Assessment will be by 60% coursework and 40% examination.

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.
Pre-requisite: EXSC1001. Foundations of exercise science
Assessment will be 30% coursework and 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.
Pre-requisite: EXSC1001. Foundations of exercise science
Assessment will be 80% coursework and 20% examination.

EXSC2007. **Exercise prescription and training** (6 credits)

The course provides students with hands-on skills for fitness (wellness) coaching for a wide spectrum of athletes / clientele. The course will provide students with the skills to plan, design, instruct and monitor a proper training program (exercise prescription) for the client. Basic knowledge of human anatomy and exercise physiology are highly recommended.
Pre-requisite: EXSC1001. Foundations of exercise science
Assessment will be 60% coursework and 40% examination.

EXSC3002. **Advanced exercise physiology** (6 credits)

This course provides a more advanced understanding of the respiratory and cardiovascular adaptations to physical exercise; plus areas of applied work physiology (e.g. diving, altitude, thermoregulation, water balance and ergogenics).
Assessment will be 40% coursework and 60% examination.

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 will be 100% coursework.

EXSC3004. **Physical activity and disability** (6 credits)

This course provides an overview of the relationship between physical/psycho-social health and physical activity in persons with disabilities. It also explores the current concepts and trends in adapted physical activity.
Assessment will be 50% coursework and 50% examination.

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 will be 100% coursework.

**EXSC3006. Public health promotion of physical activity** (6 credits)

This course introduces the concepts and methods of using physical activity as a public health tool. The distribution of physical inactivity in the population will be discussed in context with the health of the population, and the evidence base for effective interventions will be reviewed. The course will also review how the evidence base informs national and international policy aimed at promoting physical activity.

Assessment will be 70% coursework and 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 will be 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 and more detailed information about the specialism should be obtained from the Institute of Human Performance (IHP) Academic Office.

Assessment will be 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 analyses 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 will be 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 will be 100% coursework.

**EXSC3011. Advanced exercise prescription and training** (6 credits)
The course is designed to complement PBSL2239 Exercise Prescription and Training and will build upon the basic knowledge with applied knowledge of optimal testing and measurements which guide exercise prescription strategies and the effective design of exercise training programmes for specific populations. At the end of the course students will be able to form an evidence-based opinion on exercise prescription and training and be aware of state-of-the-science developments in this area. Assessment will be 60% coursework and 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 will be 70% coursework and 30% examination.

**EXSC3013. Sport and exercise nutrition (6 credits)**

"The amount, composition and timing of food intake can profoundly affect sports performance" – International Olympic Committee (Maughan et al, 2004)

This course provides students with current evidence-based knowledge of sport and exercise nutrition and demonstrates the link between nutrition and sport performance. More specifically, this course will cover the role of major macronutrients, minerals, vitamins, antioxidants, supplements and fluid intake in sustaining and enhancing sports performance. To facilitate understanding of the key principles of sports and exercise nutrition, a fundamental knowledge of exercise physiology and/or biochemistry would be an advantage.

Assessment will be 50% coursework and 50% examination.

**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 of persons with movement difficulties in dynamic environments.

Assessment will be 100% coursework.

**EXSC4000. Dissertation (12 credits) (Year 4) (Capstone Requirement)**

The dissertation 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-area of physical activity and exercise science, and to show ability in writing in the normal academic style of a journal article. Students taking the dissertation should have already completed a statistics course.

Pre-requisite: EXSC1001. Foundations of exercise science

Assessment will be 100% coursework.