



MPhil Sport and Exercise Medicine

Course information

2016-2018

**Division of Exercise Science and Sports Medicine
Department of Human Biology, Faculty of Health Sciences,
University of Cape Town, South Africa**

**3rd Floor, Sports Science Institute of South Africa, Boundary Road,
Newlands, Cape Town, South Africa**

Enquiries: Course Administration: Ms Ayesha Hendricks.

[Ayesha.Hendricks @uct.ac.za](mailto:Ayesha.Hendricks@uct.ac.za)

Course convenor

Dr Jeroen Swart

Name of the programme

Master of Philosophy in Sport & Exercise Medicine (MPhil Sport & Exercise Medicine)

Entrance requirements

Graduates who have completed at least an MBChB degree (or equivalent) and are registered with the Health Professions Council of South Africa as a medical practitioner may apply. Selection is very competitive and is made on the basis of academic merit, involvement in sport, sporting background and administrative teaching experience in sport. Applicants may be required to attend an interview. Applicants from any geographical area inside or outside South Africa may apply.

Closing date for applications: 30 September 2016

Course curriculum (General)

The curriculum of the Sport and Exercise Medicine course is divided into four parts, as follows:

Part 1A (First Year) Course code HUB5006W

Basic Sciences: This part comprehensively covers Exercise Physiology and Biochemistry, Functional and Applied Anatomy, Pathology, Biomechanics and Research Methodology (see details in Appendix A).

Part 1B (Second Year) Course code HUB5025W

Clinical Sports Medicine: This part comprehensively covers Exercise-related Injuries (diagnosis, management, rehabilitation and biomechanics) and the Medical Aspects of Exercise (including a systematic approach to the effects of exercise in each system of the body) (see details in Appendix A).

Part 1C (Third Year) Course code HUB5026W

Clinical Sports Medicine: This part comprehensively covers Exercise-related Injuries (diagnosis, management, rehabilitation and biomechanics) and the Medical Aspects of Exercise (including a systematic approach to the effects of exercise in each system of the body) (see details in Appendix A).

Part 2 (Research project) (Maximum of 5 years from the 1st year) Course code HUB5007W

Research: This part comprises the background literature review, study design, application for research ethics approval, data collection, interpretation of data and writing of a research article in Sport and Exercise Medicine. Each student will be expected to complete the research project during the studies. Planning for the project will commence in the first year of study, and data collection, write-up and presentation will be completed over a minimum 3-year and maximum 5-year period. Graduation with the MPhil degree will only be possible on successful completion of the course work (Parts 1A, 1B and 1C), the clinical skills requirements (Part 3) and the dissertation (Part 2).

Part 3 (Clinical skills) (Maximum of 5 years from the 1st year)

Clinical Skills: This part requires the student to attend and participate in the care of patients at accredited clinical Sports Medicine facilities throughout the country. A logbook of minimum clinical requirements will have to be completed by each student over the 3-year study period. During their study period students

will be expected to attend accredited Sport and Exercise Medicine clinics or gain suitable clinical experience in Sport and Exercise Medicine. Students will be required to accumulate a total of 300 hours of clinical experience prior to graduation.

Method of instruction

Instruction will be based on textbook readings and where necessary, additional materials posted on UCTs Vula web site. The expertise utilised in compiling the material is largely drawn from the Faculty of Health Sciences. On three occasions in each year students will be expected to attend a one-week period of intensive teaching at the University of Cape Town. During the first two visits, students will be required to present seminars to staff and students. They will be evaluated and the marks will count towards their year mark. As mentioned, each student completes a research project during the period of study (maximum of 5 years). The project will be conducted either in a laboratory or in the field. Students will be guided in choosing appropriate projects, which fall within the scope of research in ESSM. A supervisor will guide and support the student through each step of the project.

Assessment methods

Part IA: Basic Sciences

The final mark for Part 1 is made up of:

Year mark (30% of total)

The year mark will be made up of marks obtained for the class tests in the 1st year of study. The March test will constitute 10% and the July test 20% of the year mark.

Total: 30%

Written examination (70% of total)

In November of the first year, two papers will be written. Each of these will contribute to the final mark as follows:

Basic Sciences: Paper 1	(35%)
Basic Sciences: Paper 2	(35%)

Total: 70%

Parts 1B and 1C: Clinical Sports Medicine (Exercise-related Injuries and Medical Aspects)

Part 1B will be conducted over two years (2nd and 3rd year of study), in two sections respectively (Exercise-related Injuries and Medical Aspects). The two sections, Exercise-related Injuries, and the Medical Aspects, will therefore be covered in alternate years. The sequence of these sections will vary every year. On completion of one year, the examinations will be conducted to complete each section.

Parts 1B and 1C: Year marks (15% of total)

The year mark for each section (2nd year, and 3rd year) will be made up by marks obtained for the class tests and practicals during each year. All the class tests will contribute to the year mark. The year marks for the 2nd and 3rd year will each contribute 15% to the total mark.

Exercise-related Injuries section	(7.5%)
Medical Aspects section	(7.5%)

Total: 15%

Parts 1B and 1C: Written examinations (25% of total)

In November of the 2nd and the 3rd years (Exercise-related Injuries and Medical Aspects in two different years) a paper will be written which will contribute to the final mark as follows:

Exercise-related Injuries section	(12.5%)	
Medical Aspects section	(12.5%)	
		Total: 25%

Parts IB and IC: Clinical examination (25% of total)

In November of each year (Exercise-related Injuries and Medical Aspects) a clinical examination (short and long cases) (10%) and an Objective Structured Clinical Examination (OSCE) (5%) will be conducted which will contribute to the final mark as follows:

Exercise-related Injuries section	(15%)	
Medical Aspects section	(15%)	
		Total: 30%

Part 2: Research project (30% of total)

The completed research project will contribute 30% to the final mark.

Total: 30%

Part 3: Clinical skills

Students will be assessed on clinical skills by completing requirements as stipulated by the Department. These will include documenting clinical contact hours over the study period.

Total marks for Parts 1 to 3 (for graduation):

Total: 100%

Awarding of the MPhil (Sport and Exercise Medicine) degree with distinction:

The degree may be awarded with distinction under the following categories:

- 1) in the clinical work and course work
- 2) in the dissertation
- 3) the degree as a whole (clinical work, course work and the dissertation)

Careers opportunities on completion

Although Sport and Exercise Medicine is not as yet a recognized clinical specialty, medical doctors with the MPhil in Sport and Exercise Medicine can look forward to the following opportunities:

- * Recognition that the degree is an added qualification
- * Career opportunities in the private sector with a specific interest in Sport and Exercise Medicine
- * Further academic and research opportunities
- * Increasing employment opportunities in professional and amateur sports

Applications

These should be made online via the UCT web site
(<http://www.uct.ac.za/apply/applications/postgraduates/>)

Fees

Fees for the MPhil Sport and Exercise Medicine are obtainable from the Faculty office (see Contact Information below) and vary from year to year. Students can anticipate an average 10% increase in fees each year. An additional annual levy for material/notes is charged in the first 3 years of course work. For fees payment, please see UCT bank account details below:

UCT bank details for locally based students

Standard Bank
Rondebosch: 025009
Account: 27 068 9982
(Use your student number as reference)

UCT bank details for international students:

Standard Bank
Rondebosch: 025009
Account: 27 068 9982
Swift address: SBZA ZAJJ
(Use your student number as reference)

For registration and fee queries, please contact Mrs Salega Tape at the Postgraduate Administration office, Faculty of Health Sciences

(Email: Salega.Tape@uct.ac.za ; Tel: +27 21 406 6340) see details below.

Financial assistance

Financial assistance for post-graduate studies at the University of Cape Town is available. Enquiries can be directed to the Faculty of Health Sciences (see Contact Information below). For UCT Postgraduate degree funding, see the following URL:

<http://www.uct.ac.za/apply/funding/postgraduate/applications>

Contact information

Course convenor: Dr Jeroen Swart, Department of Human Biology, Faculty of Health Sciences, 3rd Floor, Sports Science Institute of South Africa, Boundary Road, Newlands, Cape Town, 7700, South Africa Tel.. +27 (21) 650 45762, Email: jeroen.swart@uct.ac.za

Course administrator: Ms Ayesha Hendricks, Department of Human Biology, Faculty of Health Sciences, 3rd Floor, Sports Science Institute of South Africa, Boundary Road, Newlands, Cape Town, 7700, South Africa Tel.: +27 21 650 4565; Fax: +27 21 650 1769, Email: Ayesha.Hendricks@uct.ac.za

Faculty of Health Sciences - Online registration at <http://www.uct.ac.za>. Enquiries: Mrs Salega Tape, Tel: +27 (21) 406 6340; Email: Salega.Tape@uct.ac.za

UCT Administrative office address: Central Admissions Office, University of Cape Town, Private Bag, Rondebosch 7700 or the Faculty of Health Sciences, Barnard Fuller Building, Anzio Road, Observatory 7925, South Africa

Fees: Mrs Salega Tape, Tel: +27 (21) 406 6340; Fax: 086 519 1342; Email: Salega.Tape@uct.ac.za

[ESSM website: http://essm.uct.ac.za](http://essm.uct.ac.za)

[SSISA website: www.ssisa.com](http://www.ssisa.com)

International students: There are 2 categories of international students:

(1) SADC (Southern African Development Community) students - who are eligible to pay local fees

(2) Non-SADC students - students from other parts of Africa and the rest of the world - who are all eligible to pay full international fees. International fees are levied in South African rands (ZAR).

Please refer to the fees section for more information. Email: int-iapo@uct.ac.za

Appendix A

Detailed course outline for modules in Parts 1A and 1B

The details of the course curriculum is subject to change on an annual basis

1st Year - Part 1A (Basic Sciences) HUB5006W

1. Muscle Physiology

Theoretical instruction:

The student will be required to have a thorough understanding of the following physiology:

- Basic structural properties of muscle
- Physiology of muscle contraction
- Energetics of muscle contraction
- The role of sarcoplasmic reticulum in muscle in the fatigued state
- Adaptations (acute and chronic) of skeletal muscle induced by exercise
- Muscle fatigue
- Electromyographic (EMG) activity and muscle function
- Neurophysiology of movement
- Basic and advanced experimental techniques in muscle physiology

Practical instruction:

The student will be required to display competence in the following practical procedures related to muscle physiology:

- Muscle function testing (including isometric, isokinetic and isotonic muscle function tests)
- Electromyographic (EMG) analysis of muscle function
- Muscle biopsy techniques and interpretation of results

2. Cardiovascular physiology:

Theoretical instruction:

The student will be required to have a thorough understanding of the following aspects of cardiovascular physiology:

- Biochemical basis of myocardial function and electrical stability
- Control of the circulation at rest and during exercise
- The control of heart function at rest and during exercise
- Myocardial adaptations to exercise training
- The cardiovascular response to exercise in different environmental conditions such as altitude and heat

Practical instruction:

The student will be required to display competence in the following practical procedures related to cardiovascular physiology:

- Perform a comprehensive exercise test to assess the cardiovascular response to exercise

including online analysis of oxygen consumption

3. Respiratory physiology:

Theoretical instruction:

The student will be required to have a thorough understanding of the following aspects of respiratory physiology:

- Gas exchange
- Oxygen transport
- Carbon dioxide carriage in blood
- Ventilatory mechanics
- Pulmonary function testing
- Ventilation during exercise
- Exercise testing protocols
- Control of breathing

Practical instruction:

The student will be required to display competence in the following practical procedures related to respiratory physiology:

- Lung function testing (rest)
- Lung function testing (exercise)

4. Exercise biochemistry:

Theoretical instruction:

The student will be required to have a thorough understanding of the following aspects of exercise biochemistry:

- General basis of bioenergetics of exercise
- Fuel supply in exercise
- Carbohydrate metabolism during exercise
- Lipid metabolism during exercise
- Protein and amino acid metabolism
- Lactate metabolism during exercise
- Acid-base balance
- Post-exercise recovery
- Hormonal response to exercise

Practical instruction:

The student will be required to display competence in the following practical procedures related to exercise biochemistry:

- Administration and interpretation of a standardised, validated dietary questionnaire to assess fuel intake in preparation for exercise training

5. Introduction to biomechanics:

Theoretical instruction:

The student will be required to have a thorough understanding of the following aspects of biomechanics:

- Biomechanics general principles
- The general principles of the biomechanics of running
- Scientific principles of cycling biomechanics
- Biomechanics mechanics
- Biomechanics stress & strain
- Biomechanics muscle
- Biomechanics tendons
- Biomechanics bone
- Biomechanics cartilage

Practical instruction:

The student will be required to display competence in the following practical procedures related to biomechanics:

- Interpretation of the results obtained from biomechanical running gait analysis
- Assessment and implementation of the principles of cycling biomechanics
- Interpretation of the results obtained from biomechanical analysis performed on tissues using stress/strain curve

6. Research methodology:

This section comprises a series of lectures designed to familiarise the student with the basic elements of clinical research methodology.

7. Clinical anatomy

This section of the course is a self-study module that is designed to prepare the student for the Part 2 curriculum.

8. Basic pathology

This section of the course is a self-study module that is designed to prepare the student for the Part 2 curriculum.

**2nd and 3rd Years - Parts1B and 1C (Clinical Sports Medicine)
HUB5025W and HUB5026W**

1. Medical Aspects

1.1. Myology

- Muscle "cramps" during exercise (Aetiology, pathogenesis)
- Muscle "cramps" during exercise (Diagnosis, and management)
- Chronic muscle fatigue in the athlete: A clinical approach
- Chronic exercise and skeletal muscle damage
- Skeletal muscle diseases: with special reference to exercise

1.2. Cardiology

- Coronary artery disease: General introduction, aetiology, and risk factors
- Coronary artery disease risk factors: Lack of regular physical exercise
- Coronary artery disease risk factors: Hyperlipidaemia
- Coronary artery disease risk factors: Cigarette smoking
- Coronary artery disease risk factors: Hypertension
- Coronary artery disease risk factors: Obesity
- Current concepts in cardiac rehabilitation

- Practical aspects of cardiac rehabilitation
- Special considerations for exercise prescription in cardiac rehabilitation
- The role of regular physical exercise in the management of hypertension
- Exercise performance, testing and training in chronic CCF
- Sudden death in athletes
- Clinical evaluation of the athlete with cardiac symptoms
- Sports cardiology I: Athletic heart syndrome
- Sports cardiology II: Hypertrophic cardiomyopathy
- Sports cardiology III: Myocarditis
- Sports cardiology IV: Mitral valve prolapse
- CVS abnormalities: Recommendations for competitive sport

1.3. Pulmonology

- Clinical evaluation of the athlete with respiratory symptoms in athletes
- Asthma and exercise-induced asthma
- Chronic obstructive airways disease
- Pulmonary rehabilitation: principles and practical guidelines
- Respirator tract infections in the athlete: epidemiology, clinical approach

1.4. Endocrinology and metabolism

- The exercise response in endocrine disorders
- Exercise and diabetes mellitus
- Exercise and thyroid gland disorders
- Exercise and the female reproductive hypothalamic-pituitary-gonadal axis
- Exercise and the male reproductive hypothalamic-pituitary-gonadal axis
- Exercise and bone metabolism: Parathyroid hormone, Vitamin D, calcitonin

1.5. Dermatology

- Diagnosis and management of common skin disorders in the athlete
- Prevention and treatment of sun damage
- Exercise related skin allergies

1.6. Haematology /Immunology and infectious diseases

- Exercise and the immune system
- Iron balance in exercise
- HIV disease in sport
- Exercise and allergies
- Thrombophilia and exercise

1.7. Oncology

- Exercise and cancer
- Cancer and physical activity

1.8. Gastroenterology

- Diagnosis and management of GIT symptoms in endurance athletes
- Epidemiology of gastrointestinal distress in athletes

1.9. Nephrology

- Exercise and the kidney I: Pathophysiology
- Clinical approach to proteinuria in the athlete

- Clinical approach to haematuria in the athlete
- Rehabilitation of patients with chronic renal disease

1.10. Obstetrics and Gynaecology

- Exercise and pregnancy
- Clinical approach to menstrual abnormality in the female athlete

1.11. Neurology

- Central nervous system I: Headache
- Central nervous system II: Epilepsy
- Exercise and depression

1.12. Rheumatology

- Clinical approach to the athlete with an inflamed joint
- Exercise rehabilitation in patients with rheumatoid arthritis
- Exercise rehabilitation in patients with osteoarthritis
- Rheumatological disease that mimics a sports injury: A clinical approach

1.13. Fluid balance and electrolyte disturbances

- The importance of volume in regulating gastric emptying
- Hyponatremia during exercise
- Fluid replacement and exercise stress

1.14. Diving Medicine

1.15. Sport and Exercise Medicine in Special Populations

- Exercise in childhood
- Exercise and aging
- Exercise and the disabled
- The female athletic triad

1.16. Environmental Sports Medicine

- High altitude and atmospheric pollution
- Heatstroke and hypothermia during exercise
- Exercise performance and intercontinental travel

1.17. Sports Pharmacology

- Basic principles of pharmacology and exercise
- Cardiovascular pharmacology in Sport and Exercise Medicine
- GIT, respiratory and CNS pharmacology in Sport and Exercise Medicine
- Exercise and prescription drugs
- Ergogenic aids in Sport: Laboratory procedures

1.18. Sports Nutrition

- Nutrition: Introduction
- Dietary standards
- Sports nutrition
- Nutrition in prevention and treatment of disease
- Macronutrient balance and chronic disease risk

1.19. The elite athlete

- Implications of exercise testing for prediction of athletic performance
- Training overload, overtraining and the overtraining syndrome
- Monitoring of training load
- Exercise and de-adaptations

1.20. Emergency Sports Medicine

- Clinical diagnosis and management of the collapsed athlete
- Planning medical facilities at an endurance event

1.21. Sports Psychology

2. Exercise-related Injuries

2.1. Introduction to Exercise-related Injuries

- Epidemiology of sport and exercise-related injuries
- A general clinical approach to an overuse injury
- Pre-participation athletic examination

2.2. Prevention of exercise-related injuries (General principles)

2.3. Muscle and soft tissue injuries

- Acute soft tissue injuries
- Prevention of acute muscle injuries in sport
- Chronic muscle injuries in athletes
- Delayed-onset muscle soreness
- Chronic tendinopathies
- Principles of rehabilitation of soft tissue injuries

2.4. Knee injuries

- Functional anatomy of the knee joint
- Clinical assessment of the acutely injured knee in the athlete
- Acute injuries to the knee
- Acute injuries to the anterior cruciate ligament
- Rehabilitation post ACL reconstruction
- Acute injuries to the posterior cruciate ligament
- Acute injuries of the collateral ligaments of the knee
- Acute meniscal injuries of the knee
- Acute fractures of the knee
- Clinical assessment of the athlete with chronic knee pain
- Clinical biomechanics of overuse injuries of the knee in athletes
- Chronic anterior knee pain in the athlete
- Chronic medial knee pain in the athlete
- Uncommon causes of chronic knee pain in athletes
- Overuse injuries of the knee in swimmers
- Overuse injuries of the knee in cyclists
- Surgical treatment of chronic knee pain in athletes
- Final phase rehabilitation of the knee
- Rehabilitation of the injured knee in the athlete

2.5. Lower leg injuries

- Clinical assessment of the acutely injured lower leg in the athlete
- Acute injuries to the lower leg in athletes
- Functional anatomy of the lower leg
- Clinical assessment of the athlete with chronic pain in the lower leg
- Clinical biomechanics of overuse injuries of the lower leg in athletes
- Overuse injuries of the lower leg
- Uncommon causes of lower leg pain in the athlete
- Surgical treatment of chronic lower leg pain in athletes
- Rehabilitation of chronic lower leg injuries in athletes
- Chronic exertional compartment syndrome – testing

2.6. Ankle and foot injuries

- Functional anatomy of the knee joint
- Clinical assessment of the acutely injured ankle and foot in the athlete
- Acute fractures to the ankle and foot in athletes
- Acute ligamentous injuries of the ankle and foot athletes
- Prevention of ligamentous ankle injuries in the athlete
- Clinical assessment of the athlete with chronic pain in the foot/ankle
- Clinical biomechanics of overuse injuries of the foot/ankle in athletes
- Chronic heel pain in the athlete
- Chronic midfoot pain in the athlete
- Chronic forefoot pain in the athlete
- Surgical treatment of chronic ankle and foot pain in athletes
- Rehabilitation of ankle and foot injuries in athletes

2.7. Hip and pelvis injuries

- Functional anatomy of the hip and pelvis
- Clinical biomechanics of the hip and pelvis
- Clinical assessment of the acutely injured hip and pelvis in the athlete
- Acute fractures to the hip and pelvis in athletes
- Acute soft tissue injuries of the hip and pelvis in athletes
- Clinical assessment of the athlete with chronic pain in the hip and pelvis
- Overuse injuries of the hip and pelvis
- Sacro-iliac joint dysfunction in athletes
- Clinical approach to the athlete with the "difficult buttock"
- Clinical approach to the athlete with the "difficult groin"
- Surgical treatment of chronic hip and pelvis injuries in athletes
- Rehabilitation of hip and pelvis injuries in athletes

2.8. Head and neck injuries in athletes

- Functional anatomy of the head and neck
- Clinical biomechanics of the cervical spine
- Clinical assessment of the athlete with a possible acute head/neck injury
- Acute fractures of the head and neck
- Acute soft tissue injuries of the cervical spine in athletes
- Neck and spinal cord injuries with special reference to rugby
- Clinical assessment of the athlete with chronic pain neck pain
- Overuse injuries of the neck
- Rehabilitation of the cervical spine in athletes
- Clinical approach to the athlete with suspected minimal brain damage
- Head injuries in sport with special reference to rugby, boxing and cycling
- Neuropsychological assessment of athletes
- Concussion – Assessment, management and RTP guidelines

2.9. Shoulder injuries

- Functional anatomy of the shoulder
- Clinical assessment of the acutely injured shoulder in the athlete
- Acute injuries to the shoulder
- Acute fractures of the knee
- Acute soft tissue injuries of the shoulder
- Clinical assessment of the athlete with chronic shoulder pain
- Clinical biomechanics of overuse injuries of the shoulder in athletes
- Chronic shoulder injuries in the athlete
- Uncommon causes of chronic shoulder pain in athletes
- Overuse injuries of the throwing athlete
- Surgical treatment of chronic shoulder injuries in athletes
- Rehabilitation of the injured shoulder in the athlete

2.10. Elbow and forearm injuries

- Functional anatomy of the elbow and forearm
- Clinical biomechanics of the elbow and forearm
- Clinical assessment of the athlete with an acute elbow and forearm injury
- Acute fractures of the elbow and forearm
- Acute soft tissue injuries of the elbow and forearm
- Clinical assessment of the athlete with chronic elbow and forearm pain
- Overuse injuries of the elbow and forearm
- Uncommon causes of chronic elbow and forearm pain in athletes
- Surgical treatment of chronic elbow and forearm injuries in athletes
- Rehabilitation of the chronic elbow and forearm injuries in athletes

2.11. Wrist and hand injuries in athletes

- Functional anatomy of the wrist and hand
- Clinical biomechanics of the wrist and hand
- Clinical assessment of the athlete with an acute wrist and hand injury
- Acute fractures of the wrist and hand
- Acute soft tissue injuries of the wrist and hand
- Clinical assessment of the athlete with chronic wrist and hand pain
- Overuse injuries of the wrist and hand
- Uncommon causes of chronic wrist and hand pain in athletes
- Surgical treatment of chronic wrist and hand injuries in athletes
- Rehabilitation of the wrist and hand in athletes
- Splinting the wrist and hand in athletes

2.12. Injuries to the lumbar spine in athletes

- Functional anatomy of the lumbar spine
- Clinical biomechanics of the lumbar spine
- Clinical assessment of the athlete with an acute lower back injury
- Acute fractures of the lumbar spine
- Acute soft tissue injuries of the lumbar spine
- Clinical assessment of the athlete with chronic lower back pain
- Overuse injuries of the lower back
- Uncommon causes of chronic lower back pain in athletes
- Surgical treatment of chronic lower back pain in athletes
- Rehabilitation of the lower back

2.13. Musculoskeletal radiology in sport

- General introduction to Sports Radiology
- Plain film X Rays
- Soft tissue diagnostic ultrasound
- Computerised Tomography (CT) scanning
- Magnetic Resonance Imaging (MRI) scanning
- Colour flow Doppler
- Triple phase technetium bone scanning
- Other application of Nuclear Medicine in Sports Medicine

2.14. Sports Podiatry

- General introduction to Sports Podiatry
- Podiatric assessment of the athlete
- Casting of an orthosis
- Construction of an orthosis

2.15. Sports Dentistry