



# HUB

Department of Human Biology  
Physiological Sciences



## B(Med)Sc(Hons) in Biokinetics

*(HUB4079W Course Work, HUB4080W Biokinetics Honours Project)*

**DIVISION OF PHYSIOLOGICAL SCIENCES  
DEPARTMENT OF HUMAN BIOLOGY  
FACULTY OF HEALTH SCIENCES  
UNIVERSITY OF CAPE TOWN**

## STUDENT BROCHURE 2025

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## Orientation Programme (All New Students)

<b>ORIENTATION WEEK 2025</b>		
<b>WEDNESDAY 29 JANUARY 2025</b>		
09h00– 09h30	Arrival: SSISA Cards & Photos (Classroom 1)	Neezaam Kariem
09h30 – 10h30	Welcome & Introduction (Classroom 1)	Jacolene Kroff, Tayla Ross, Malcom Collins, Alison September
10h30 – 11h00	Tea	
11h00 - 11h30	Introduction to the Department of Human Biology & Division of Physiological Sciences	
11h30 – 13h00	Hons. Biokinetics (Classroom 1)	Jacolene Kroff, Tayla Ross
11h30 – 13h00	Hons. Exercise Science (Classroom 2)	Malcom Collins, Alison September
11h30 – 13h00	MSc & PhD (Boardroom)	
13h00 – 14h00	Lunch	
14h00 – 15h00	Desk Allocation (Student Lounge)	Rizaan Behardien, Tim Klein
15h00 – 16h00	HPALS Laboratory Protocols (2 <sup>nd</sup> floor)	Dale Rae, Rizaan Behardien, Tim Klein, Trevino Larry, Neezaam Kariem
<b>THURSDAY 30 JANUARY 2025</b>		
09h00 – 10h00	ICTS Introductory Session & Emergency Protocol (Classroom1)	Trevino Larry, Neezaam Kariem
10h00 - 10h30	Tea	
10h30 – 12h30	Exercise Science: Overview of Year Programme, Q&A (Classroom 2)	Malcom Collins, Alison September
10h30 – 12h30	Biokinetics: Overview of Year Programme, Q&A (Classroom 1)	Jacolene Kroff, Tayla Ross
12h30 - 13h30	Lunch	
13h30 – 15h00	HPALS - Introduction, History & Structure	Yumna Albertus
15h00 – 16h00	Biokinetics Students – Uniforms and Admin Forms (Classroom 1)	Jacolene Kroff, Tayla Ross, Ayesha Hendricks
<b>FRIDAY 31 JANUARY 2025</b>		
09h00 - 10h00	Div of Phys Sciences Staff Introduction (Classroom 1)	All Staff & Students
10h00 - 10h30	Cake and Tea	
10h30 - 11h30	HPALS Research Meeting	All Staff & Students
12h00 –13h00	Pearls of Wisdom', Student Rules & Codes of Conduct (Classroom 1)	Rizaan Behardien, Tim Klein
13h00 – 15h00	Social Outing	All Staff & Students

## INTRODUCTION TO THE HONOURS PROGRAMME

Welcome to the B(Med)Sc(Hons) Biokinetics (Course Code HUB4079W & HUB4080W) course at the University of Cape Town (UCT). We hope that you will enjoy the course and that it will be the basis of a successful and fulfilling career. This brochure describes the history of the various courses offered in our unit and explains how the Biokinetics honours course will be structured and coordinated in 2025.

The Biokinetics honours degree has been evaluated and adapted to include more practical and clinical work. In most institutions, including our own, a multidisciplinary approach is used to acquire an integrated understanding of the effects of physical activity on the body.

### **Background to the Division of Physiological Sciences (Previously ESSM) & Our Postgraduate Degrees**

Professor Timothy Noakes began his exercise research in a small basement laboratory within what was formerly the Department of Physiology, with one laboratory assistant and a single bicycle. By 1989, the research had grown to such an extent that the South African Medical Research Council (MRC) and UCT agreed to fund a MRC/UCT Bioenergetics of Exercise Research Unit (BERU). In 1981, Professor Noakes was appointed by UCT to establish an Honours degree in Sports Science for scientists, physical educators, physiotherapists and doctors. The purpose of the course was to satisfy the South African demand for a more scientific approach to the maintenance of good health and success in sport.

In 1991 the original Sports Science Honours course was divided into two streams: Exercise Science and Biokinetics. As the field evolved, specialist Sport and Exercise Medicine and Sports Physiotherapy MPhil courses were developed in 1990 and 1995 respectively, with the aim of providing physicians and physiotherapists with a more evidenced-based approach to their respective fields. In August 1995, the Unit moved into the Sports Science Institute of South Africa (SSISA) in Newlands, and in 2000 changed its name to the UCT/MRC Research Unit for Exercise Science and Sports Medicine (ESSM). More recently, a new MPhil course in Biokinetics was established in 2011. Professor Noakes retired at the end of 2014 and the Directorship of the Unit was taken over by Professor Vicki Lambert. At the same time, the Unit became recognised as the Division of Exercise Science and Sports Medicine within the Department of Human Biology, Faculty of Health Sciences. From the 1<sup>st</sup> of May 2021, the division joined another division under the Department of Human Biology and changed the name to the **Division of Physiological Sciences**.

The Honours Exercise Science and Biokinetics courses are now distinct with clearly defined learning objectives and outcomes. There are however certain aspects which are common to both courses. This material will be presented in the Exercise Physiology Fundamentals and Technique modules at the beginning of the year, the Research Methodology module, and in combined lectures throughout the year. Both the Exercise Science and Biokinetics Honours courses are one-year full-time courses, while the MPhil courses in Sports Physiotherapy, Sport and Exercise Medicine and Biokinetics are part-time courses, which take about three years to complete.

## Our Vision

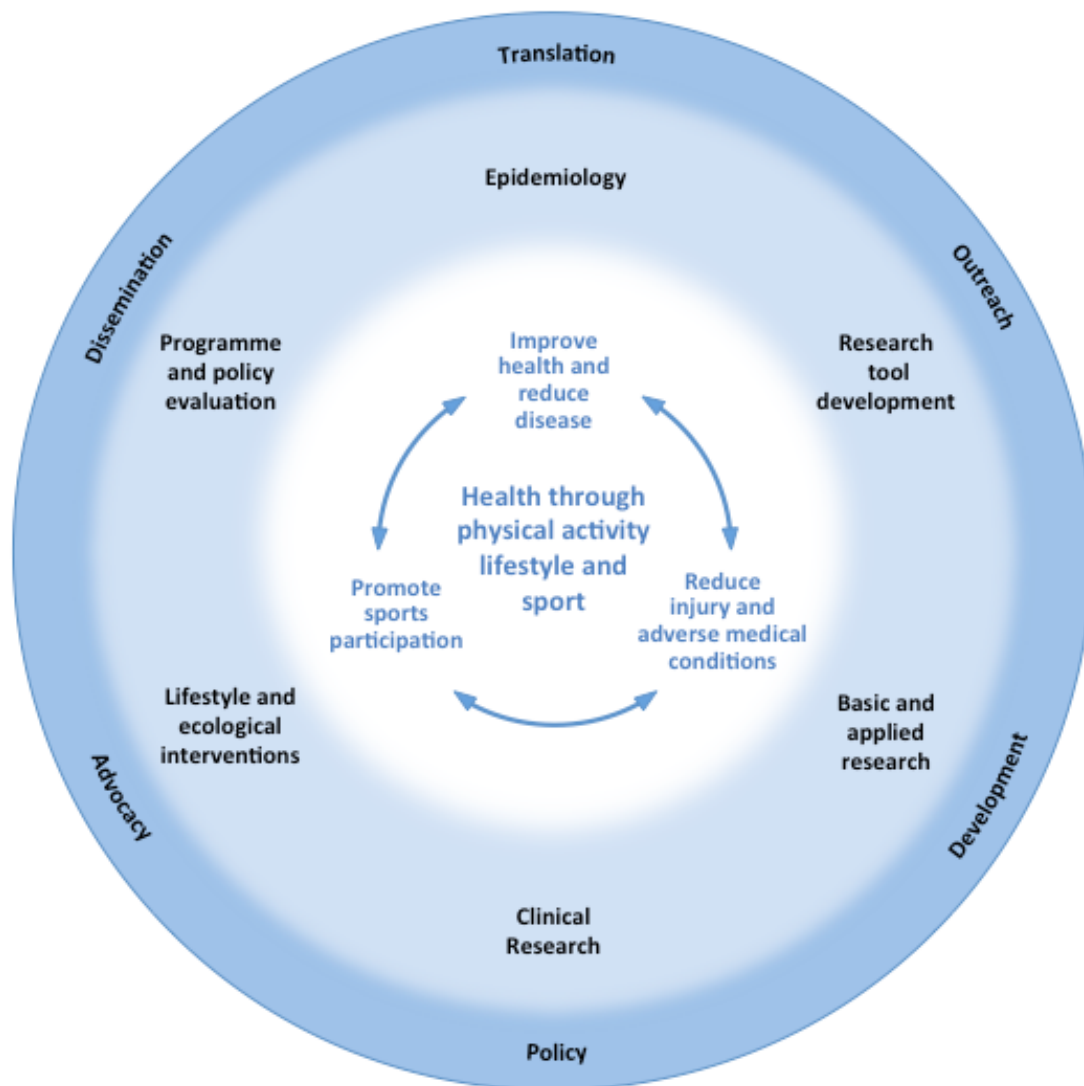
*"An active, healthy and winning nation through science".*

## Our Mission Statement

*"A center of excellence for promoting a healthy, active lifestyle and optimal physical performance, through research, innovation, teaching, training, and clinical services".*

## HPALS Research Focus

*"Health through physical activity, lifestyle and sport"*



## **HPALS Research Objectives**

- To conduct research focused on (i) improving health and reducing disease, (ii) reducing injury and adverse medical conditions associated with physical activity and sport, and (iii) promoting sports participation.
- To conduct research of the highest international standard, recognising the interdisciplinary nature of our work as its key strength.
- To recognise the holistic and complex nature of related lifestyle behaviours and co-morbid conditions, high performance, issues of safety and unintended consequences of participation in physical activity and sport.
- To ensure that our programme of research is relevant to all South Africans, addressing issues of social justice and equity, for the development of human capital, communities and the nation.
- To disseminate knowledge through teaching of an international standard, and through translation to the wider community, informing policy and practice.

The Exercise Science and Exercise Physiology part of the Division consists of research facilities which includes three exercise laboratories, two clinical laboratories, five molecular biology / biochemistry laboratories, a biokinetics laboratory, a biomechanics laboratory, an environmental chamber, a metabolic chamber and a sleep laboratory.

## **The Sports Science Institute of South Africa (SSISA)**

SSISA was built as a Section 21 (not for gain) company called Sports Science Share Block (Pty) Ltd, with funds donated to UCT in 1994. The mission of SSISA is to “optimise the sporting performance and health of all South Africans through the execution, application and dissemination of science”. More information about SSISA can be obtained from [www.ssisa.com](http://www.ssisa.com).

Although both Physiological Sciences and SSISA have worked together on many projects since 1995, their governance has been different. This is partly due to Physiological Sciences being an academic institution and falling under the jurisdiction of the University of Cape Town, whereas SSISA is a not-for profit company. SSISA and Physiological Sciences share their knowledge, scientific application, research and resources to the benefit of both entities and the population it serves.

## **Programme Exit Level Outcomes**

At the end of the programme the graduate must be able to:

1. Demonstrate knowledge, understanding, and skills regarding the structure and function of human body systems and their responses during exercise.
2. Apply principles of exercise science and physiology to develop assessment skills and prescribe exercise safely.
3. Integrate psycho-social aspects of health, human performance, and chronic conditions to ensure a holistic approach to healthcare.
4. Utilise biomechanics to evaluate abnormalities in posture and human movement.
5. Analyse human motor behaviour to identify abnormal movement patterns related to neuromuscular functioning.
6. Apply specialised knowledge and skills in health promotion and education for individuals and various communities.
7. Perform risk stratification for exercise prescription, injury prevention, and final-phase rehabilitation of musculoskeletal injuries.
8. Understand and address the pathophysiology, rehabilitation, and management of chronic diseases and disabilities.
9. Demonstrate competence in research methodologies, scientific writing, and executing biokinetics-specific research projects.
10. Manage private and public biokinetic facilities ethically and professionally, demonstrating effective organizational and leadership skills

## **Specific Graduate Attributes**

At the end of the programme graduates must be able to:

1. Communicate effectively in written, verbal, and non-verbal forms with diverse audiences and healthcare providers.
2. Identify, analyse, and solve problems while critically evaluating and refining interventions.
3. Act responsibly and ethically, demonstrating confidence and understanding a duty of care toward patients and clients.
4. Assume leadership roles and adapt to different responsibilities or tasks within community settings.
5. Stay informed about new developments and research in the field to maintain and enhance expertise.
6. Apply a holistic approach to support patients and clients in improving their quality of life.
7. Design and implement community-based interventions that account for socio-economic and cultural differences.
8. Maintain accurate records while upholding patient and client confidentiality.
9. Use scientific, evidence-based techniques for assessments and treatments.
10. Function effectively within both public and private healthcare systems.

*(Minimum Standards for the training: Biokinetics, Professional Board for Physiotherapy, Podiatry and Biokinetics)*

## OUTLINE OF THE BIOKINETICS HONOURS PROGRAMME

The Biokinetics Honours Programme is divided into three major components under two separate course codes:

### HUB4079W

1. Course Work
2. Clinical Work

### HUB4080W

3. Research Project & Write Up

### 1. COURSE WORK

	No.	Name	Subsections	Term
Term 1	1	<b>Exercise Physiology Module (EP)</b>	EP Fundamentals Biomechanics Techniques Foundations of EP Techniques	3 – 14 February 5 – 7 March 17 February – 7 March
	2	<b>Health Promotion &amp; Special Population Module (HP)</b>	Apparently Healthy Population Elderly Children Pregnancy Persons with Disabilities	10 – 28 March
Term 2	3	<b>Chronic Diseases Module (CD)</b>	Patients at Risk Cardiac & Cardiovascular Disease Respiratory Diseases Osteoporosis Arthritis Fibromyalgia Obesity and Diabetes Organ transplant Cancer Neuromuscular Disorders	22 April – 16 May
Term 3	4	<b>High Performance Module (HPA)</b>	High Performance Periodization Plyometrics Resistance Training Applied Nutrition Athletic Assessments	11 – 29 August
Whole Year (until Sep)	5	<b>Orthopaedic Module (ORTHO)</b>	General Biokinetics Practice Module Joints (Anatomy, Assessment & Rehab)	7 April – 23 September
	6	<b>Research Methods &amp; Biostatistics Module (RESE)</b>	See Module Explanation	

## **Semester Layout**

The Exercise Physiology Module (Fundamentals & Techniques) will run during Term 1, as well as the Health Promotion & Special Populations Module. The Chronic Diseases Module will run during the Term 2, and the Neuromuscular and Skeletal Systems Module will run during Term 3. The Orthopaedic Rehabilitation Module and Research Methods & Biostatistics Module will run from Term 1 to Term 3. The Orthopaedic Rehabilitation Module forms part of the Clinical Work Module. Knowledge and experience gained from this Module will mostly be evaluated during all Clinical Exams and during the second theory examination.

The structures of these modules vary, but each one has a theory, practical and applied component. Evaluation of the modules includes lab-based practical's and/or assignments and/or a written test.

The focus of the second semester is to gain more clinical experience and to conduct research. The aim of this component of the course is to integrate the theory and practical teaching from the first semester to the clinical and research setting.

A macro weekly overview of Semester 1 and Semester 2 are illustrated on the next two pages.



January 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	1	2	3	4
	New Year's Day					
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	
			ORIENTATION			

February 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
	FUNDAMENTALS					
9	10	11	12	13	14	15
	FUNDAMENTALS					
16	17	18	19	20	21	22
	EX PHYS TECHNIQUES					
23	24	25	26	27	28	
	FUN TEST	EX PHYS TECHNIQUES				

March 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
	BLS	BLS	BIOMECHANICS			
9	10	11	12	13	14	15
	HEALTH PROMOTION					
16	17	18	19	20	21	22
	HEALTH PROMOTION				Human Right's Day	
23	24	25	26	27	28	29
	HEALTH PROMOTION					
30	31					

April 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
		TERM 1 HOLIDAY				
6	7	8	9	10	11	12
	BACK & NECK					
13	14	15	16	17	18	19
	HP TEST	BIO PRAC			Good Friday	
20	21	22	23	24	25	26
	Family Day	CHRONIC DISEASE				
27	28	29	30			
Freedom Day	Observed	CHRONIC DISEASE				

May 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
				Worker's Day		
4	5	6	7	8	9	10
	CHRONIC DISEASE					
11	12	13	14	15	16	17
	CHRONIC DISEASE					
18	19	20	21	22	23	24
	HIP					
25	26	27	28	29	30	31
	KNEE					

June 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
	THEORY EXAM 1					
15	16	17	18	19	20	21
	Youth Day	CLINICAL EXAM 1	CLINICAL EXAM 1			
22	23	24	25	26	27	28
	MIDYEAR HOLIDAY					
29	30					

July 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
		MIDYEAR HOLIDAY				
6	7	8	9	10	11	12
		MIDYEAR HOLIDAY				
13	14	15	16	17	18	19
		MIDYEAR HOLIDAY				
20	21	22	23	24	25	26
	SHOULDER					
27	28	29	30	31		
	STATS WEEK					

August 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
	ANKLE					Women's Day
10	11	12	13	14	15	16
	NEMS					
17	18	19	20	21	22	23
	NEMS					
24	25	26	27	28	29	30
	NEMS					
31						

September 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
	ELBOW & WRIST					
7	8	9	10	11	12	13
	TERM 3 HOLIDAY					
14	15	16	17	18	19	20
	BIO PRAC					
21	22	23	24	25	26	27
	REVISION		Heritage Day			
28	29	30				
	THEORY EXAM 2					

October 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
		CLINICAL EXAM 2	CLINICAL EXAM 2			
12	13	14	15	16	17	18
			RESE TEST			
19	20	21	22	23	24	25
26	27	28	29	30	31	

November 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
	THEESIS HAND IN					
9	10	11	12	13	14	15
			FINAL CLINICAL EXAM	FINAL CLINICAL EXAM		
16	17	18	19	20	21	22
23	24	25	26	27	28	29
	THEESIS PRESENTATION					
30						

December 2025						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
		Day of Reconciliation				
21	22	23	24	25	26	27
				Christmas Day Boxing Day		
28	29	30	31			

## 2. CLINICAL WORK

The clinical component of the course consists of Clinical Rotations and Bio Lab sessions. For the Clinical Work Module, you will be evaluated through 3 Clinical Exams, Objective Structured Clinical Examinations (OSCEs). Your clinical rotation mark will be determined by your clinical rotation hours, your supervisor evaluations and your patient portfolio.

### Clinical Rotations

In keeping with the HPCSA's requirements for the training of Student Biokineticists, the Biokinetics honours course comprises designated blocks each week during which students are given the opportunity to gain hands on experience while being supervised by registered Biokineticists in real world clinical settings. Here, biokinetics students are expected to apply the theoretical underpinnings of the controlled use of physical activity in the prevention of disease and as the primary therapeutic modality during final phase rehabilitation (provided during in the form of lectures and workshops). **Students are required to complete a minimum of 500 hours of work-integrated learning. In UCT's Biokinetics programme, 150 hours is embedded in the course work, whereas the remaining 350 hours need to be accumulated by the student within affiliated practices and at community sites.**

Importantly, students will be required to keep a detailed record of the sessions they attend in a **patient portfolio**. Each rotation session (including group-based classes) must be documented as this portfolio will be used to assess students during their Clinical Examinations and will furthermore be evaluated at certain times during the year. Students are encouraged to neatly structure a table of contents for their patient folder, type up all contact hours, and to consider that the more comprehensive the cases, and the more cases presented in the portfolio, the better the impression of the student's clinical experience.

Several different rotations will be available to students during the year, which you will be allocated to. You will rotate according to a clinical rotation roster to ensure you have equal exposure to each practice. Some practices are busier than others making it possible for both students to go to the same practice simultaneously, but certain rotations will include 2 (or more) venues where one of you will go to the one practice and one to the second practice. The following week the two students will swop practices, for example, or any other arrangement that fits both students and the clinical rotation.

All rotations will run for **4-5 weeks per rotation**. Mondays and Thursdays have been allocated specifically to clinical rotations, but students are expected to schedule additional hours in throughout the week. Students are expected to schedule **no less than 12-20 hours of rotations per week**. During each rotation, students will be accountable to mentoring supervisors with whom they are expected to schedule and arrange their hours with. It is essential that the student liaise directly with the supervisor to determine the operating hours of the practice, and any other requirements. Should the student be unable to make a clinical rotation due to personal circumstances (illness or family emergency), this must be conveyed to the supervisor prior to the day, and clinical work hours must be made up at some other time.

### Clinical Rotation Slots:

- Mondays: 06h00 – 18h00
- Tuesdays: 06h00 – 08h00, 17h00 – 19h00
- Wednesdays: 06h00 – 08h00, 17h00 – 19h00
- Thursdays: 06h00 – 18h00
- Fridays: 06h00 – 08h00, 17h00 – 19h00

The clinical rotations format and timetable information will be sent to you via email. During lecture block weeks, such as “ortho weeks” or “statistics week”, lectures might clash with clinical rotations. Students must schedule different clinical rotation times with their specific supervisor during these weeks to obtain at least 12 clinical hours. Sometimes official exams will also clash with clinical rotations. The student must inform the supervisor that they cannot attend the rotation due to exam. Students will not be expected to “catch up” lost clinical rotation times due to official exams/tests.

### Evaluation of Clinical Rotations

The number of clinical hours obtained plus the average mark of all supervisor evaluations will determine your mark for your clinical rotations. HPCSA regulations recommends 350 hours of clinical rotations during the training year. **The minimum number of hours acceptable during the year is 350 hours.** Fewer than 350 logged hours will negatively influence your mark for clinical rotations, subsequently affecting your Clinical Work Module Mark. Finally, two forms per student are required to be handed in **within 1 week** after rotation completion:

- a) Student Log Sheet
- b) Clinical Supervisor’s Evaluation

The student log sheet is signed off by the rotation supervisor or supervising biokineticist/intern at the end of each session, and may only be completed by a clinician who directly supervises a student (i.e., not by a practice secretary or an individual who did not directly mentor a student while seeing a patient). Request the supervisor of the rotation at least one week prior to the end of your rotation to complete the evaluation form and to hand this back to you on your last day of your rotation (in envelope). You must accumulate at least 8 supervisor evaluation throughout the year. Fewer evaluation forms, late evaluation forms and/or logged forms will negatively influence your mark for clinical rotations.

The mark for clinical rotations is weighted as follows:

- Clinical Rotation Hours: 60%
- Average Supervisor Evaluation Marks: 20%
- Patient Portfolio Folder: 20%

The final mark for clinical rotations will contribute 15% toward your final course work mark (HUB4079W).

## Community Outreach

Victoria Hospital and CHIPS are community outreach rotations which is a compulsory section of your overall clinical hours. Apart from Victoria Hospital, where you will complete clinical hours on Monday where possible, the managers of CHIPS will frequently ask for the assistance from Hons Biokinetics students to assist with field testing. Western Cape on Wellness, SHAWCO, as well as some other NPOs, will also provide opportunities throughout the year for students to help and gain community hours. By the end of the year, students must have accumulated at least **80 Community Outreach Hours**.

## Clinical Rotation Practices

The following practices/programmes will be part of the clinical rotations:

- SSISA Fitness Centre
- SSISA Old Mutual
- SSISA Shape
- SSISA High Performance Centre
- SSISA Ortho & Neuro Rehabilitation (Avinesh Pursad Biokineticist)
- Angie Lander Biokineticist (Peak Biokinetics)
- Loreen Winton Biokineticist
- Robert Evans Biokineticist (Enable Centre)
- Kim Murphy Biokineticist
- Micaela Frade Biokineticist
- Samantha Knobel Biokineticist
- Herschel Girls School
- CHIPS
- Victoria Hospital
- Cape Sports Medicine
- Western Cape on Wellness

## Biokinetics Labs

Biokinetics Labs are clinical sessions which focus on different clinical aspects of the Biokinetics profession – including assessment skills, clinical reasoning skills and case study discussions. **These sessions are not compulsory but are highly beneficial and therefore attendance is encouraged.** You will receive clinical rotation hours for attending.

Monday: 10h00 – 12h00 (Ms Tayla Ross)

Thursday: 13h00 – 14h00 (Mr Avinesh Pursad, COTED)

### 3. RESEARCH PROJECT & WRITE UP

#### Research Project

**Module convenor: A/Prof Dale Rae**

This project reflects the student's ability, in consultation with their supervisors, to plan and propose a project and research methodology; to collect data with excellent quality control; to manage and analyse the results and interpret the results of this research study in an evidence-based manner. The students' projects will be selected from a list of available projects that will be handed out within the first several weeks of the course. Projects will be selected based on suitability, and where possible, by choice. In most cases, honours projects form smaller sub-projects under a larger, postgraduate, or funded study. Project "teams" will be formed consisting of staff, and senior students, who will be working with honours students on these projects.

The supervisor(s) will guide the student through the process of preparing a literature review and project proposal. The proposal will then be presented to the Unit for critical input. The data collection phase of the project should ideally be completed by the middle of October. The completed project should be handed in on **Monday 3 November before 16h00**. The research project will be evaluated as a written report and in an oral presentation (**Monday 24 November**). All the skills required to conduct a successful research project will be presented in the Research Methods and Statistics module described above.

### CONTRIBUTIONS TO THE FINAL MARK

Assessments for the year are divided into Theoretical and Practical, and formative vs summative assessments. The purpose of formative assessments is to provide feedback from which you will be able to learn and apply to the next series of learning topics within the course. Summative assessments are all the exit level examinations serving as the final theory and practical assessments.

#### List of Assessments

**Module Tests (Summative):** Written tests will be conducted on two separate occasions during the first semester, before the June examination. The Exercise Physiology (Fundamentals) test will cover all content of the Fundamentals (first two weeks) of the Exercise Physiology module. The second test will be the Health Promotion Module Test. The Chronic Disease and NEMS module will not have an independent test after the completion of the module. The RESE module consists of several different components that will contribute to the final RESE Module mark (See Module 6).

**Lab-Based & Module Assignments (Formative):** Assignments will mostly consist of administering exercise testing/physical assessments and exercise prescription. You will receive written or verbal feedback on the outcome of your assignment from the lecturer to inform you of certain areas/aspects you need to focus on or change and apply this to future similar activities.

**Case Study Assignments (Formative):** Either during Bio Lab sessions or clinical rotations you may be asked to complete a case study and present this to the class or a small group. Additionally, case study assignments can be in the form of written hand-ins if a presentation is not an option. Real time feedback will be given from the facilitator. Not all but some of the case study presentations may count towards the Module Assignments mark.

Your average mark for all assignments completed within all modules will account for 10% of your final mark for the year. The number of assignments differ from year to year, but the approximate number of assignments to complete are 10 assignments.

**Theory Examination 1 (Summative):** Paper 1 is a written face-to-face examination (**9 June 2025**) and will contain questions which are designed to integrate the knowledge of all the work during the Health Promotion and Chronic Disease Modules.

**Theory Examination 2 (Summative)** Paper 2 is a written face-to-face examination (**29 September 2025**) and will cover the content of the Exercise Physiology Techniques, NEMS, and Orthopaedic Module.

**Clinical Examinations 1 & 2 (Formative Assessment):** Two clinical examinations will serve as preparation for the final clinical exam (**Exam 1: 17 & 18 June; Exam 2: 7 & 8 October**). Both clinical examination 1 and 2 will count 5% towards the final mark. The two clinical examinations are completed orally face-to-face in the presence of 3-4 examiners. The layout and structure of the exam will be provided 2-3 weeks prior to the clinical examination dates. Feedback based on performance will be given retrospectively prior to the second (for clinical exam 1) and final (for clinical exam 2) exam to improve on clinical skills.

**Final Clinical Examination (Summative):** The final Biokinetics Clinical Exam will take place over 2 days (**12 & 13 November**) and will be assessed by an external examiner. Your final clinical exam will contribute 20% towards your final Coursework mark.

**Clinical Supervisor Evaluation (Formative):** At the completion of a series of clinical rotations at a private practice, the supervisor will be asked to complete an evaluation form based on your performance during shadowing at his/her practice. During your clinical exams 1 and 2 feedback you will receive feedback on the clinical supervisor evaluation to improve on specific areas of your clinical skills, communications during clinical rotations.

### **Important Additional Information:**

All clinical exams (Clinical Exam 1, 2 and Final) cover mostly the content of your Patient Portfolio (Clinical Rotations) and the content of the Chronic Disease Module and Orthopaedic Module.

Assessment of the work of all Theory Modules, Final exams, and clinical work module, will each constitute 20%, 30%, and 50% of the final Course Work (HUB4079W) mark for the year, respectively. For your Honours research project, the written hand-in will contribute

80%, the Research and Biostatistics module will contribute 10%; and your project presentation will contribute 10% toward the final mark for Biokinetics Hons Project (HUB4080W).

Prior to each major assessment (tests, exams, and clinical exams) a briefing will be held to provide you with a study guide based on the structure, layout, format and overall broad topic contents of the assessment.

To reach a first class pass for the Honours Degree, the weighted average **(75%/25%) of HUB4079W AND HUB4080W** must be equal or above 75% and both courses must have a mark of 70% or higher. Students **MUST PASS** HUB4079W and HUB4080W with a minimum of 50%.



## FINAL MARK CONTRIBUCTIONS

HUB4079W HONS BIOKINETICS COURSEWORK (75% TO TOTAL FOR DEGREE)		
THEORY MODULES	Contribution to final mark	Accumulated contribution of Component to final mark
Exercise Physiology Fundamentals test	5	20%
Average of all assignments (Ex Physiology Techniques, Orthopaedic Module, CD module, HPA module, HP module)	10	
Written Module Tests	5	
WRITTEN EXAMS		
Theory exam 1 (HP,CD)	15	30%
Theory exam 2 (HPA, Ortho, EP Techniques)	15	
CLINICAL WORK MODULE		
Clinical rotations (patient portfolio, case study presentation, supervisor evaluation, log hours)	20%	50%
Clinical exam 1	5%	
Clinical exam 2	5%	
Exit Final Clinical Exam	20%	
HUB4080W HONS RESEARCH PROJECT (25% to TOTAL FOR DEGREE)		
Project Hand-In	80%	
Project Presentation	10%	
Research Module (Proposal presentation, proposal hand-in, Test and class assignments)	8%	
Research Paper Examination	2%	
For a first-class pass students must achieve 70% or higher for both course codes and the weighted average: coursework 75% and project 25% must be 75% or higher.		

## ADMINISTRATION

### Amathuba and Google Calendar

On occasion, notes and/or reading material will be loaded onto the Amathuba site prior or after lectures, tutorials, or practical's. Students are responsible for printing notes and reading material. However, **access to lecture notes is up to the discretion of the lecturer**, and lecture notes may only be available on Amathuba after the lecture. Lecturers have the right to not make their lecture slides available to students.

Each student will receive an email inviting them to access the Google calendar. Lecture schedules will be maintained on this electronic calendar. Name of calendar: "Bio Hons Classes".

Students are responsible for ensuring that they are up to date with all lectures, tutorials, practical sessions, and exam dates. Lecture times might change occasionally, and this is largely due to travel demands of staff.

### Friday HPALS Meetings

Honours students will join the weekly HPALS (Health through Physical Activity, Lifestyle and Sport) Research Centre meeting along with staff, MSc and PhD students and other interested parties and stakeholders of HPALS. At 10h15 on Friday mornings there will be tea and cake, followed by the meeting at 10h30 – the first 15minutes will be administrative with announcement and achievements highlighted. The last 45 minutes will be a hybrid form webinar (so international individuals can join as well) during which various topics will be presented and discussed related to Exercise Science. The presenter will either be a student, staff member or visiting academic. **The HPALS meeting is compulsory to all Honours Students.** If you cannot attend the meeting due to unforeseen circumstances, you must inform the Friday meeting Coordinators via email no later than the Thursday prior to the meeting.

### Class Representative & Responsibilities

Early in the year the class will elect a class representative who will help to facilitate communication between the students and convenor/s. More information regarding this great opportunity will be discussed in person. Additionally, each month two students will be responsible for the cleanliness and upkeep of the Biolab on the second floor. This will entail ensuring that the room is put back to its original set-up at the end of each day, that equipment is accounted for and stored away correctly and that surfaces are cleaned at regular intervals.

### Journal Clubs

The Division coordinates several Journal clubs managed by selected members of the Division's respective research teams. If the research domain is of interest to you; or you are advised by your project supervisor to attend a specific journal club, the details – date, time and topic - of the journal club will be displayed on a different Google calendar, called HPALS Diary.

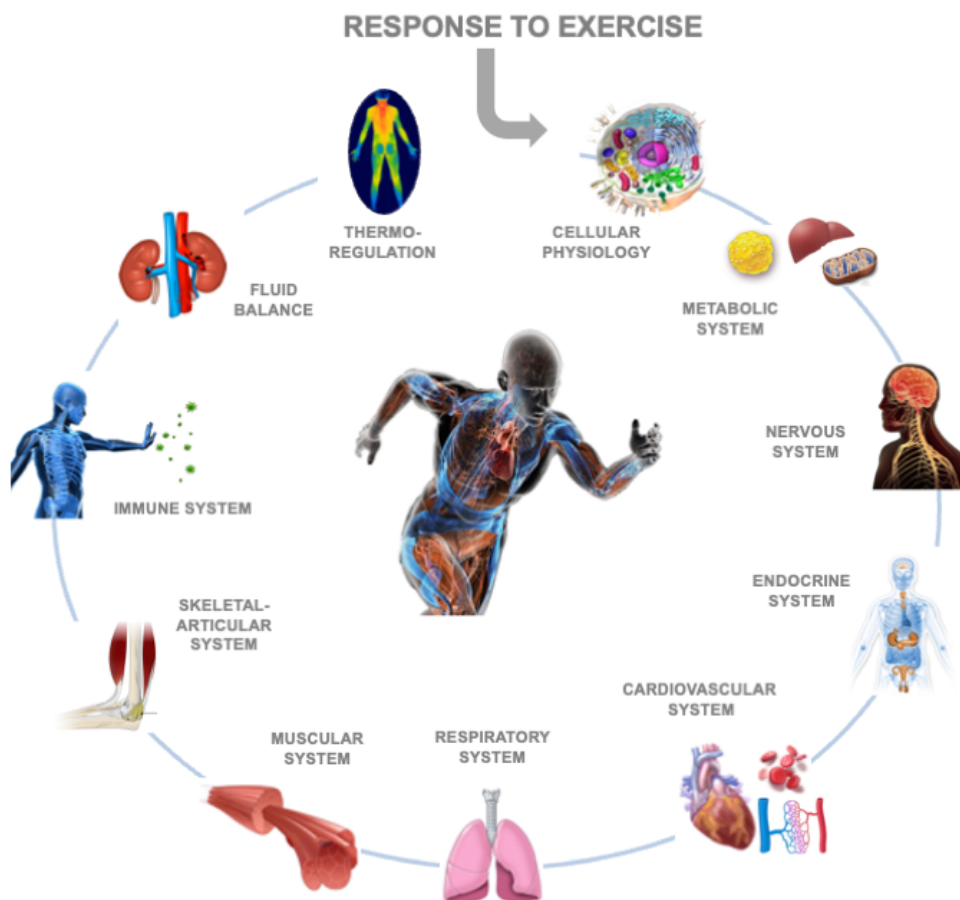
## Module 1: Exercise Physiology Module (EP)

### Fundamentals of Exercise Physiology

Convenor: A/Prof Dale Rae

This module will run from Monday 3 February to Friday 14 February 2025 in Classroom 1. A tutorial is scheduled for each lecture topic to help students with any content-related sticking points arising. The detailed programme is shown below.

### FUNDAMENTALS OF EXERCISE PHYSIOLOGY



### Objectives

To provide the student with a comprehensive and integrated overview of the bodies' response to exercise, emphasising the acute response to exercise and long-term effects of training on:

- Cellular Physiology
- Metabolic System
- Nervous System
- Endocrine System

- Cardiovascular System
- Respiratory System
- Muscular System
- Skeletal-Articular System
- Immune System
- Fluid Balance
- Thermoregulation

After completion of this module, the student should be able to understand, define and describe:

### **Cellular Physiology** – Prof Alison September (2 lectures)

- Introduction to the cellular level organisation, structure and functions of the various components and organelles.
- The Nucleus
  - transcription
  - translation
- The cell membrane/ plasma membrane and understand its functions
  - mechanisms of transport across the plasma membrane e.g. passive transport, vesicle transport, phagocytosis, facilitated diffusion, osmosis, active transport

### **Metabolic System** – Prof Malcolm Collins (4 lectures)

- Overview of metabolic pathways
- Anaerobic metabolism:
  - high energy phosphates, glycolysis, glycogenolysis,
- Aerobic/oxidative metabolism
  - mitochondria
  - tricarboxylic acid cycle
  - electron transport chain
  - oxidative phosphorylation
- Basic concepts of nutrition
- Liver gluconeogenesis
- Glucose transport and homeostasis
- Adipose tissue and free fatty acids
- Protein and amino acid metabolism

### **Nervous System** – A/Prof Yumna Albertus (3 lectures)

- Overview of anatomy and terminology of the central and peripheral nervous systems
- Voluntary generation and control of movement
- The concept of fatigue

### **Endocrine System** – Dr Kate Larmuth (3 lectures)

- Overview of components of the endocrine system relevant to exercise
- The importance of homeostasis
- Regulation of the storage and mobilisation of metabolic fuels, blood pressure, heart rate, temperature, fluid balance

### **Cardiovascular System** – A/Prof Jeroen Swart (3 lectures)

- Overview of anatomy and terminology of the heart and blood vessels
- Regulation and control of the cardiovascular system during exercise by means of neurological, hormonal and metabolic inputs
- Heart rate, cardiac output, stroke volume responses
- Limitations to cardiac performance
- Measurement of cardiovascular function during rest and exercise (e.g. ECG, heart rate)

### **Respiratory System** – A/Prof Jacolene Kroff (2 lectures)

- Overview of anatomy and terminology of the lungs, airways and respiratory muscles
- Mechanics and regulatory mechanisms of breathing during exercise
- Principles of oxygen and carbon dioxide transport from the lungs to other systems (particularly skeletal muscle) and venous return.
- Measurement of respiratory function during rest and exercise (lung function test,  $\text{VO}_2\text{max}$  test)

### **Muscular System** – Dr Sharief Hendricks (3 lectures)

- Overview of anatomy and terminology of skeletal muscle, muscle fibres and the contractile apparatus
- Cross-bridge cycle and muscle mechanics
- Metabolism – energy providing pathways (creatine, carbohydrate, fat and amino acids), metabolite transport
- Neuromuscular control of muscle contraction
- Muscle fibre type and its role in strength, power and endurance exercise
- The concept of muscle fatigue
- Damage, repair and regeneration

### **Skeletal-Articular System** – A/Prof Yumna Albertus (2 lectures)

- Overview of anatomy and terminology of bone, ligaments and tendons
- Mechanical role in locomotion
- Repair of bone, ligaments and tendons

### **Immune System** – A/Prof Jeroen Swart (2 lectures)

- Overview of components of the immune system relevant to exercise
- Effects on immune system components (i.e. leukocytes, lymphocytes, natural killer cell activity, immunoglobulins)
- The inflammatory response - cytokines
- Delayed onset of muscle soreness (DOMS)
- Endocrine regulation of immune function during exercise

### **Fluid Balance** – A/Prof Dale Rae (2 lectures)

- Regulation of body fluids
- Water balance and fluid shifts
- Exercise-induced dehydration and rehydration
- Exercise-induced hypervolemia

### **Thermoregulation** – A/Prof Dale Rae (3 lectures)

- Review of the basics of human thermoregulation
- Thermoregulation during exercise
- Thermoregulatory response to exercise in a hot environment
- Thermoregulatory response to exercise in a cold environment

### **Schedule:**

Week 1	Mon 3 Feb	Tue 4 Feb	Wed 5 Feb	Thurs 6 Feb	Fri 7 Feb
09h00-10h00	Introduction to Exercise Physiology (DR)	Anatomy Block (CABA)	Nervous System 3 (YA)	Tutorial – Nervous System (YA)	Anatomy Block (CABA)
10h00-11h00	Cellular Physiology 1 (AS)		Endocrine System 1 (KL)	Tutorial – Endocrine System (KL)	
11h00-11h30	Break				
11h30-12h30	Cellular Physiology 2 (AS)	Metabolic System 3 (MC)	Endocrine System 2 (KL)	Cardiovascular 1 System (JS)	Tutorial – Cardiovascular System (JS)
12h30-13h30	Cellular Physiology 3 (AS)	Metabolic System 4 (MC)	Endocrine System 3 (KL)	Cardiovascular 2 System (JS)	
13h30-14h30	Lunch				
14h30 - 15h30	Metabolic System 1 (MC)	Nervous System 1 (YA)	Tutorial – Metabolic System (MC)	Cardiovascular 3 System (JS)	
15h30-16h30	Metabolic System 2 (MC)	Nervous System 2 (YA)	Tutorial – Cellular Physiology (AS)		

Week 2	Mon 10 Feb	Tue 11 Feb	Wed 12 Feb	Thurs 13 Feb	Fri 14 Feb
09h00-10h00	Anatomy Block (CABA)	Skeletal-Articular System 1 (YA)	Tutorial – Muscular System (SH)	Tutorial – Immune System (JS)	Tutorial – Thermoregulation (DR)
10h00-11h00		Skeletal-Articular System 2 (YA)	Tutorial – Skeletal-Articular (YA)	Tutorial – Fluid Balance (DR)	Tea and HPALS Meeting
11h00-11h30		Break			
11h30-12h30	Muscular System 1 (SH)	Immune System 1 (JS)	Fluid Balance 1 (DR)	Thermoregulation 1 (DR)	Tutorial – Respiratory System (JK)
12h30-13h30	Muscular System 2 (SH)	Immune System 2 (JS)	Fluid Balance 2 (DR)	Thermoregulation 2 (DR)	
13h30-14h30	Lunch				
14h30 - 15h30	Muscular System 3 (SH)	Respiratory System 1 (JK)	Respiratory System 2 (JK)	Thermoregulation 3 (DR)	

### Module Outcomes

After completion of this module, the student should be able to understand, define and describe:

- Standard anatomical and physiological terminology in describing the organisation of the human body
- Macro- and micro-anatomy/physiology of the neuro- musculoskeletal, neurological, cardiovascular, pulmonary, metabolic, and/or autoimmune system
- The cellular basis of physiology, tissue and body systems including basic biochemistry and applied biochemistry in exercise and training
- Reproduction, growth, development, and aging
- Homeostasis and nutrition and basic metabolic processes
- The principles of support and movement integral to the human body
- The human body's acute responses and chronic adaptation to physical activity, exercise, and exercise training in the neuro-musculoskeletal, neurological, cardiovascular, pulmonary, metabolic, endocrine, and auto-immune system(s)
- The bioenergetics related to different modes of exercise.
- The acute and chronic responses and adaptations associated with exercising in the heat, cold, high altitude, diving and space
- The immune system, including terminology used within pathophysiology, pathogens and disease

### Assessment

This content for this module will be assessed in a test on **24 February 2025 (09h00 – 12h00)**.

## **Biomechanics & Movement Analysis Techniques Course**

**Coordinator: A/Prof Yumna Albertus & Dr Sharief Hendricks**

This three-day course is constructed to provide you with an appropriate understanding behind the biomechanical mechanisms that underpin human movement, performance and injury. The aim is to provide you with an introduction to the fundamental knowledge required to capture, model, and determine the principles of motion and its associated forces. This course provides you with an introduction to some basic physics and mathematics to applied and clinical interpretation. You will learn how to collect movement data, process the movement, construct the necessary movement planes, plot some interesting movement waveforms, and attempt to interpret the biomechanical data from a clinical or performance perspective.

This course will introduce the learners to the use of biomechanics in a sports medicine and sports science environment. Topics include, but are not limited to, throwers shoulder, lower limb injury in runners, illegal action in throwing, special population groups like cerebral palsy, and an introduction to the biomechanics laboratory, including the Vicon system (3-dimensional movement analysis), Force platform and Electromyography.

### **Practical**

Students will be taught to apply reflective markers, collecting biomechanical data and processing it for practical interpretation for walking and running.

### **Assessment**

The assessment for this course will be in the form of a written report for Biomechanics techniques.

## **Foundations of Exercise Physiology Techniques Course:**

**Convenor: A/Prof Dale Rae**

This module will take place from Monday 17 February to Friday 7 March 2025. It covers 8 topics, each of which comprises a theory session underpinning the practical sessions, which will be run by an expert in the field. Theory sessions will take place in Classroom 1 and practical sessions in the HPALS labs.

### **Objectives**

- To provide the student with the theoretical knowledge underpinning common physiological tests and techniques used to assess aspects of health, metabolism and exercise performance in humans.
- To teach students how to set up equipment, collect data and interpret findings in the context of normative values for the general population as well as for athletes.



At the end of this module, the student should understand and be able to conduct physiological testing relating to:

**Exercise Testing in Healthy Adults** (Ms Tayla Ross)

- Screening – pre-exercise screening, blood pressure, glucose, cholesterol
- Health-related physical fitness testing – cardiovascular fitness, muscle strength and endurance, flexibility
- Skills-related physical fitness testing – speed, power, agility, balance, coordination, reaction time

**Body Composition** (A/Prof Jacolene Kroff)

- Height, weight, circumference measures
- Body fat assessment (BIA, skinfolds)

**Lung Function Testing** (A/Prof Jacolene Kroff)

- Purpose of pulmonary function tests
- Forced vital capacity test

**Cardiac Function Testing** (A/Prof Jeroen Swart, Dr Caro D'Alton, Dr Fallon Hope)

- The conduction system and electrophysiology
- Basic principles of the electrocardiogram (ECG)
- ECG stress test (Bios only)

**Endurance Performance Testing** (A/Prof Jeroen Swart, Mr Tim Klein)

- Submaximal testing
- Running economy and substrate utilisation
- Maximal testing (e.g.  $\text{VO}_2$  max test)

**Cycling kinematics** (A/Prof Jeroen Swart)

- Kinematic tools for cycling
- Approach to and practical skills of bike set up

**Metabolic Testing** (A/Prof Dale Rae)

- Oral glucose tolerance test

**Physical Activity and Sleep monitoring** (Dr Kate Larmuth, A/Prof Dale Rae)

- Understanding devices used to measure habitual physical activity and sleep
- Measurement of time spent in habitual physical activity domains using accelerometry
- Assessment of habitual sleep patterns using actigraphy

## Module Outcomes

After completion of this module, the student should be able to understand, describe and apply:

- Basic components and principles as well as exercise testing and interpretation of:
  - Body composition, e.g., body fat percentage
  - Cardio-respiratory system, e.g. blood pressure, lung function, and VO<sub>2</sub>max endurance
  - Resting and exercise ECG
  - Nutritional and hydration status
  - Running & cycling physiology & biomechanics
  - Isokinetic testing
- First aid and Basic life support (BLS) level 1 certification.
- The application of ergometric, isokinetic, isotonic, isometric, electromyographic, electrocardiographic, electrophysical, cardiopulmonary, spirometric, anthropometric, photographic, videographic, biochemical, metabolic and biomechanical modalities

## Assessment

Students will be assessed based on short reports to be submitted. Date TBC.

## Schedule

Week 1	Mon 17 Feb	Tue 18 Feb	Wed 19 Feb	Thurs 20 Feb	Fri 21 Feb
08h00-09h00					Body Composition Theory (JK)
09h00-10h00	Anatomy Block (CABA)	Exercise testing Theory (TR)	PA Monitoring Theory (KL)	Anatomy Block (CABA)	
10h00-11h00			PA Monitoring Prac (KL)		
11h00-11h30	Break	Break	Break	Break	Tea and HPALS Meeting
11h30-12h30	Introduction to Common Measurements in Exercise Physiology (JK)	Health-Related Physical Fitness Testing Prac – Group 2 (TR)	Skills-Related Physical Fitness Testing Prac – Group 1 (TR)	Basic ECG Theory 1 (JS)	
12h30-13h30	Sleep monitoring Theory (DR)			Basic ECG Theory 2 (JS)	ECG Stress Test Theory (CD) 11:15-12:45
13h30-14h30	Lunch	Lunch	Lunch	Lunch	Lunch
14h30-15h30	Sleep Monitor Set-Up Prac (DR)	Health-Related Physical Fitness Testing Prac – Group 1 (TR)	Skills-Related Physical Fitness Testing Prac – Group 2 (TR)	Basic ECG Theory 3 (JS)	Stress ECG Prac (Bios Only) (MC)
15h30-16h30				Basic ECG Theory 4 (JS)	

Week 2	Mon 24 Feb	Tue 25 Feb	Wed 26 Feb	Thurs 27 Feb	Fri 28 Feb
08h00-09h00					
09h00-10h00	<b>Fundamentals Test (09h00-12h00)</b>	Anatomy Block (CABA)	Sleep Data Retrieval Prac – Group 1 (DR)	Anatomy Block (CABA)	Cycling Kinematics Prac – Group 1 (JS)
10h00-11h00			Sleep Data Retrieval Prac – Group 2 (DR)		Tea and HPALS Meeting
11h00-11h30		<b>Break</b>	<b>Break</b>	<b>Break</b>	
11h30-12h30		Metabolic Testing Theory (DR)	PA Data Retrieval Prac – Group 1 (KL)	Cycling Kinematics Theory (JS)	Lung Function Testing Prac (Group 1)(JK)
12h30-13h30		Lung Function Testing Theory (JK)	PA Data Retrieval Prac – Group 2 (KL)	Cycling Kinematics Prac – Group 2 (JS)	
13h30-14h30	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
14h30-15h30	Body Composition Prac – Group 1 (JK)	Endurance Performance Testing Theory (JS)	Endurance Performance Testing Prac – Group 1 (TK)	Endurance Performance Testing Prac – Group 2 (TK)	Endurance Performance Data Analysis Prac (TK)
15h30-16h30	Body Composition Prac – Group 2 (JK)	Lung Function Testing Prac (Group 2)(JK)			Stress ECG Prac (Bios Only) (MC)

## **Module 2: Health Promotion & Special Populations Module**

*Required Textbook: American College of Sports Medicine Guidelines for Exercise Testing and Prescription, 11<sup>th</sup> edition, B.A. Franklin (editor), Lippincott Williams and Wilkins*

### **Overview**

This module introduces Biokinetics students to working with disease free population groups. Students will gain an understanding of exercise screening, testing and prescription for apparently healthy individuals and special populations. In addition, students will have theory and practical lessons in theories of behaviour change and motivational interviewing.

### **Module Outcomes**

After completion of this module, the student should be able to understand, describe and apply:

- Historical development of therapeutic recreation as an intervention tool for different populations.
- The role of regular exercise and physical activity (and inactive or a sedentary lifestyle) on health and disease patterns (epidemiology) internationally and in SA.
- International and national trends related to health promotion (e.g., Exercise is Medicine, Millennium Development Goals, Vitality and WOW).
- The interrelationship between physical activity, fitness, functional constraints and perceptual motor development and neurological aspects of motor control over the lifespan to rehabilitation of human motor behaviour.
- Human growth, development, maturation, and aging to a variety of Biokinetics contexts, including special populations.
- Consultation, screening, testing, interpretation & prescription
  - Evidence-based models and approaches to practice
  - Motivational and interviewing skills within a Biokinetics context.
  - Assessment and documentation in therapeutic recreation; and exercise pre-participation health screening and physical activity readiness.
  - Clinical exercise testing, interpretation and patient feedback and education.
  - Health-related physical fitness and functional movement assessment and interpretation of Musculo-skeletal system, e.g., flexibility, proprioception, strength (isometric, isotonic and isokinetic), speed, power, and muscle endurance
  - Identify and correct abnormal posture and gait patterns through appropriate feedback and corrective exercises.
  - General and advanced principles of exercise prescription and how to apply general principles of exercise prescription.
  - Exercise prescription for healthy populations and for special populations: Children and Adolescents; Non-specific low back pain; Older adults; Pregnancy; Special needs: e.g., paraplegics and amputees
  - The principles related to movement through the air and water mediums.

- Therapeutic recreation evaluation protocols and programs for different individuals and groups in therapeutic and recreational contexts programs for different groups/populations; Group dynamics vs individual rehabilitation.
- Foundational theories regarding psychology and sociology in Biokinetics contexts.
  - The human psyche and health behaviour, health promotion (wellness), human functioning and performance.
  - Theoretical foundations for understanding behaviour change, exercise behaviour and adherence
  - Implementation of different strategies and wellness initiatives; Leisure education and elimination of barriers to participation
- Case studies on clinical exercise testing and evaluation

### Module Evaluation

- All the work in this module will form part of the clinical exams.
- In addition, students will complete one mini small-group assignment.
- Health Promotion Module Test: **14 April 2025 09h00 – 12h00**

HEALTH PROMOTION			
Lecture topic	Lecturer	Date	Time
Exercise Testing for the Apparently Healthy Adult 1	Tayla Ross	11-Mar	08h30 - 10h00
Exercise Testing for the Apparently Healthy Adult 2	Tayla Ross	11-Mar	10h30 - 12h00
Exercise Testing for the Apparently Healthy Adult Prac	Devon Byrnes	11-Mar	13h00 - 14h30
Exercise Prescription for the Apparently Healthy Adult 1	Tayla Ross	12-Mar	08h30 - 10h00
Exercise Prescription for the Apparently Healthy Adult 2	Tayla Ross	12-Mar	10h30 - 12h00
Exercise Prescription for the Apparently Healthy Adult Prac	Devon Byrnes	12-Mar	13h00 - 14h30
Exercise Testing, Rehabilitation & Medical Management of the Physically Disabled	Tayla Ross	14-Mar	12h30 - 14h30
Wellness 1	Devon Byrnes	18-Mar	08h30 - 10h00
Wellness 2	Devon Byrnes	18-Mar	10h30 - 12h00
Wellness 3	Devon Byrnes	18-Mar	13h00 - 14h30
Exercise Prescription During Pregnancy	Tayla Ross	19-Mar	08h30 - 10h00
Exercise Prescription During Pregnancy Prac	Tayla Ross	19-Mar	10h30 - 11h30
Exercise Prescription for Children	Tayla Ross	19-Mar	12h00 - 13h30
Exercise Prescription for Children Prac	Tayla Ross	19-Mar	14h00 - 15h00
Role of Physical Activity in Health and Disease	Kate Larmuth	25-Mar	09h00 - 10h30
Theories and Models of Behaviour Change	Kate Larmuth	25-Mar	11h00 - 12h30
Hydrotherapy Theory & Prac	Kim Murphy	25-Mar	14h00 - 16h30
5A's Approach and Healthy Messaging	Kate Larmuth	26-Mar	09h00 - 10h00
Motivational Interviewing	Kate Larmuth	26-Mar	10h30 - 11h30
Exercise and Elderly	Devon Byrnes	26-Mar	12h30 - 14h00
Exercise and Elderly Practical	Devon Byrnes	26-Mar	14h30 - 15h30
Pubertal Age Assessment	Tim Klein	28-Mar	14h00 - 15h00
<b>Health Promotion Test</b>		<b>14-Apr</b>	<b>09h00 - 12h00</b>

*Note: Students must bring their swimming costumes and a cap for the Hydrotherapy Prac.*

## **Module 3: Chronic Diseases Module**

### **Physiology, pathology and rehabilitation in chronic disease.**

*Recommended Textbooks: ACSM's Exercise Management for persons with chronic diseases and disabilities, 3<sup>rd</sup> edition. J. Larry Durstine (editor), Human Kinetics, 2009 and American College of Sports Medicine Guidelines for Exercise Testing and Prescription, 11<sup>th</sup> edition, B.A. Franklin (editor), Lippincott Williams and Wilkins*

#### **Overview of Module**

The course will introduce the concepts of cardiovascular and respiratory pathology and will also highlight the possible benefits of exercise in the prevention and treatment of certain forms of cardiovascular and respiratory disease.

The following methods of teaching will be utilised throughout the module: lectures, tutorials, demonstrations, and study assignments with report writing.

#### **Module Outcomes**

After completion of this module, the student should be able to understand, describe and apply:

- Introduction to Chronic Diseases & -Conditions: epidemiology of common diseases; long-term effects of distress and negative psycho-social factors on health; individually based risk stratification
- The risk factors, causes, pathophysiology, symptoms, management, and treatment for: neuro-musculoskeletal, neurological, cardiovascular, pulmonary, metabolic, and/or autoimmune conditions/diseases.
- Special investigation methods used to assess in chronic diseases and disabilities.
- The role of exercise testing and prescription in the management of different chronic diseases and disabilities.
- The possible role of exercise intervention programs in treating or managing various chronic diseases disabilities.
- Common medications used to treat these diseases or conditions.
  - Basic concepts of pharmacology and appropriate use of the drugs in the management and treatment of diseases related to the neuro- musculoskeletal, neurological, cardiovascular, pulmonary, metabolic, endocrine, and immune system(s).
  - The knowledge of various drugs prescribed for the treatment of and appropriate use of the drugs in the management and treatment of injuries and chronic disease.
  - Adapting exercise assessment, prescription and exercise monitoring for patients on specific drugs.
- Report writing, patient education and or referral.
- Complex problem base/case base diseases/conditions and Journal Club

#### **Module Evaluation**

- All the work in this module will form part of the clinical exams.

- In addition, students will complete 1 mini small-group assignments and present case studies.
- Chronic Diseases Module Test: **NA (Content covered in Theory Exam 1)**

CHRONIC DISEASES			
An integrated approach to chronic disease, "A patient-centered approach"	Klaus von Pressentin	22-Apr	09h00 - 10h30
Health screening and risk factor stratification	Kate Larmuth	22-Apr	11h00 - 12h30
Pharmacology basics	TBC	22-Apr	13h30 - 15h00
Stress as a risk factor for CAD	Caroline D'Alton	23-Apr	09h00 - 10h30
Hypertension and exercise & Cardiovascular pharmacology and exercise	Caroline D'Alton	23-Apr	11h00 - 13h00
Psychological considerations for patients with chronic disease 1	Phillipa Skowno	23-Apr	14h00 - 15h30
Clinical pharmacology and exercise testing/training in high-risk patients	Jeroen Swart	25-Apr	14h00 - 16h00
Exercise rehabilitation for cardiovascular disease; Peripheral vascular disease; Heart failure	Caroline D'Alton	29-Apr	09h00 - 11h00
Exercise Prescription after Organ Transplant	Caroline D'Alton	29-Apr	12h00 - 14h00
Cardiac rehabilitation in different settings	Tayla Ross	29-Apr	15h00 - 16h30
Risk factors for heart disease & Sudden death during exercise; The athlete's heart	Jeroen Swart	30-Apr	09h00 - 11h00
Obesity prevention and obesity management	Jacolene Kroff	30-Apr	12h00 - 14h00
Exercise prescription for patients with Cancer	Jacolene Kroff	30-Apr	14h30 - 16h30
Exercise prescription for patients with Epilepsy	Avi Pursad	2-May	14h00 - 15h30
Osteoporosis and the Female Athlete Triad	Tayla Ross	6-May	08h30 - 10h30
Exercise rehabilitation for respiratory and cardiovascular disease; Asthma & EIB	Jacolene Kroff	6-May	11h00 - 12h30
Exercise prescription for patients with Arthritis	Jacolene Kroff	6-May	13h00 - 15h00
Exercise rehabilitation in patients with spinal cord injuries & introduction to neuroplasticity	Tayla Ross	7-May	08h30 - 10h30
Exercise Rehabilitation for patients with brain injuries	Tayla Ross	7-May	11h00 - 13h00
Exercise prescription for diabetes 1	Jacolene Kroff	7-May	13h30 - 15h00
Exercise prescription for patients with chronic fatigue syndrome	TBC	9-May	14h00 - 16h00
Exercise Prescription for Neurodegenerative Diseases (Parkinsons, ALS, MS etc.)	Tayla Ross	13-May	08h30 - 10h30
Neurorehabilitation Practical	Tayla Ross	13-May	11h00 - 13h00
Exercise prescription for patients with Fibromyalgia	Jacolene Kroff	13-May	13h30 - 15h00

Exercise prescription for patients with Osteoporosis	Tayla Ross	14-May	08h30 - 10h00
Exercise prescription for diabetes 2	Jacolene Kroff	14-May	10h30 - 12h30
Exercise prescription for patients with HIV	Caroline D'Alton	14-May	13h30 - 15h00
Psychological considerations for patients with chronic disease 2	Phillipa Skowno	16-May	14h00 - 15h30



## **Module 4: High Performance Athlete Module**

Recommended Textbook: **Brooks, G.A., Fahey, T.D., and Baldwin, K.M., Exercise Physiology.** Human Bioenergetics and its Applications. 4th Edition, 2005

Chapter 17, Skeletal Muscle Structure and Contractile Properties, pages 363-395.

Chapter 18, Neurons, Motor Unit Recruitment, and Integrative Control of Movement, pages 396-429.

### **Overview of Module**

This module will cover the testing and management of the high performance athlete, nutrition in sports and for exercise recovery and optimal performance, and exercise testing and interpretation of the musculoskeletal system and muscle activity.

### **Module Outcomes**

After completion of this module, the student should be able to understand, describe and apply:

- Testing and management strategies for the high performance athlete.
- Nutrition in sports and for exercise recovery and optimal performance.
- Evidence surrounding trends in nutrition.
- Exercise testing and interpretation of the musculoskeletal system and muscle activity.
- The application of isokinetic and electromyographic modalities.
- Apply biomechanical knowledge for the development and implementation of appropriate and scientifically-based exercise programs.
- Apply appropriate periodisation strategies to ensure progression of interventions.
- Qualitative biomechanical analyses on basic resistance exercises and common sporting techniques.
- Anatomical analyses of both isolated and integrated movements as well as common exercises and simple sporting manoeuvres.
- Apply the criteria for return to play/sport protocols & for successful discharge.

### **Module Evaluation**

- This module will form part of the June written exam and the clinical exams.
- In addition, students will complete 1 mini small-group assignment.
- NEMS Module Assignment: **15 September 09h00 – 12h00**

HIGH PERFORMANCE ATHLETE MODULE			
Lecture topic	Lecturer	Date	Time
High Performance Athlete	Sharief Hendricks	12-Aug	09h00 - 10h30
Introduction to High performance testing and Management	Sharief Hendricks	12-Aug	11h00 - 12h30
Plyometric Training 1	Devon Byrnes	12-Aug	13h30 - 15h00
Heart Rate, Exercise Performance and HIMS	Tim Klein	13-Aug	09h00 - 10h30
Overview of types of resistance training	Sharief Hendricks	13-Aug	11h00 - 12h30
Measurement and interpretation of strength, local muscle endurance and power	Devon Byrnes	13-Aug	13h00 - 15h30
Periodization 1	Sharief Hendricks	19-Aug	09h00 - 10h30
EMG activity – theory	Yumna Albertus	19-Aug	11h00 - 12h30
EMG activity – practical	Yumna Albertus	19-Aug	13h00 - 15h00
Nutrition for weight gain (including supplements)	Devon Byrnes	20-Aug	09h00 - 11h00
Isokinetic Testing: THEORY	Devon Byrnes	20-Aug	11h30 - 13h00
Isokinetic Testing: PRACTICAL	Devon Byrnes	20-Aug	14h00 - 15h30
Plyometric Training 2	Devon Byrnes	22-Aug	14h00 - 15h30
Resistance training for different goals and Programme Design	Sharief Hendricks	26-Aug	09h00 - 10h30
Periodization 2	Sharief Hendricks	26-Aug	11h00 - 12h30
Nutrition for weight loss (fads and fashions)	Devon Byrnes	26-Aug	13h30 - 15h00
Biomechanics of resistance exercise	Sharief Hendricks	27-Aug	09h00 - 10h30
Resistance training and “spotting” techniques prac & self-directed learning	Sharief Hendricks	27-Aug	11h00 - 12h30
Sports specific nutrition with practical applications	Devon Byrnes	27-Aug	13h30 - 15h00
Readiness to return to play	Ayden Smith	29-Aug	14h00 - 15h30
High Performance Athlete	Sharief Hendricks	12-Aug	09h00 - 10h30

## Module 5: Orthopaedic Rehabilitation and Biokinetics Practice Module

*Recommended Textbooks: **Techniques in Musculoskeletal Rehabilitation**, W. E Prentice and Voight MI, McGraw-Hill, 2001. ISBN 0 07 135498 0 and **The Foundations of Athletic Training: Prevention, Assessment and Management**. 3<sup>rd</sup> edition, M.K. Anderson, S.J. Hall, M. Martin, Lippincott Williams & Wilkins, 2008. ISBN 978 0781784450*

### Overview of Module

The main aim of this module is to teach Biokinetics students the aetiology, assessment and exercise prescription for various orthopaedic injuries. In addition, the scope of practice of Biokinetics and related professions, developing a business plan, the basic principles of starting a business, and general HPCSA rules and regulations about Biokinetics.

### Module Outcomes

Part one of this module aims to teach students about Biokinetics Practise. The objectives are:

- Rules and regulations of Biokinetics practice, the scope of Biokinetics practice and ethical rules formulated by the Health Professions Council of South Africa.
- Health policy, health systems and structures, capacity building and interdisciplinary healthcare as required in SA legislation, including ICD 10 and BHF codes.
- Practice management skills and competencies, including equipment maintenance, human resources and supervise programs, individuals, teams and subordinates within the value system of the profession
- Market and financial aspects, and entrepreneurial skills of a Biokinetics practice

Part two and three: The specific objectives are:

- Introduction to Orthopaedic Injuries & -Conditions.
  - Wound healing and pain; Acute and chronic inflammation.
  - Effects of common drugs used on exercise testing or training responses.
  - Fundamental motor development and perceptual- motor development theories and concepts to a variety of contexts
  - Structure and function of the central nervous system as it relates to human functioning in Biokinetics context.
  - Neuromuscular control for rehabilitation and body posture; The principles of optimal flexibility, muscle strength and proprioception on static and dynamic postures.
  - Normal and abnormal human movement patterns in relation to neuromuscular functioning (e.g., gait).
- The basic understanding of incidence, symptoms, and aetiology of specific orthopaedic injuries/conditions.
  - Medical and injury histories of a variety of patients.
  - Specialised manual evaluation techniques in assessing an individual's injury.
  - Advanced exercise testing equipment and techniques to assess individuals with different injuries.

- Signs and symptoms indicating emergency medical attention, further investigation, or referral of the patient.
- Report writing and referral.

### Module Evaluation

- All the work in this module will form part of the clinical exams.
- Students will complete five mini small-group assignments.
- No theory test will be conducted, competencies are tested during clinical examinations and theory aspects during the June Written Exam.

ORTHOPAEDIC MODULE			
Lecture	Lecturer	Date	Time
<b>I) ORTHOPAEDIC MODULE (GENERAL)</b>			
Gen: Grading of injuries; Receiving referrals; Components of clinical assessment: Introduction to pathophysiology of orthopaedic injury & healing	Caroline D'Alton	7-Apr	09h00 - 10h30
Gen: End of Range Feels and Clinical Measurement and assessment (Goniometry etc)	Avi Pursad	7-Apr	11h00 - 12h30
Gen: Motor development and motor learning in sports rehabilitation	TBC	7-Apr	13h00 - 14h30
Gen: Motor learning & motor control basics 1	Elizma Atterbury	17-Apr	09h00 - 10h30
Gen: Principles and Application of Balance and Proprioceptive Training 1	Elizma Atterbury	17-Apr	11h00 - 12h30
Gen: Motor learning & motor control basics 2	Elizma Atterbury	22-May	09h00 - 10h30
Gen: Principles and Application of Balance and Proprioceptive Training 2	Elizma Atterbury	22-May	11h00 - 12h30
Gen: Neurodynamics 1	TBC	23-Jul	11h00 - 12h30
Gen: Neurodynamics 2	TBC	23-Jul	13h30 - 15h00
Gen: Gait retraining	Neil Hopkins	16-Sep	13h30 - 15h00
Gen: Amputee conditioning	Neil Hopkins	17-Sep	13h30 - 15h00
<b>II) DIFFERENT JOINTS (THEORY AND APPLIED)</b>			
<b>Back and Neck</b>			
Spine: Clinical and functional surface anatomy of the spine, neck and head:	Tayla Ross	8-Apr	08h30 - 10h30
Spine: Clinical biomechanics of the spine and aetiology of common back injuries	Tayla Ross	8-Apr	11h00 - 13h00
Spine: Assessment of back injuries	Tayla Ross	8-Apr	14h00 - 16h00
Spine: clinical Biomechanics of neck and aetiology of common neck injuries.	Tayla Ross	9-Apr	08h30 - 10h30
Spine: Neck injury assessment	Tayla Ross	9-Apr	11h00 - 13h00
Spine: Spine and Neck rehabilitation 1	Tayla Ross	9-Apr	14h00 - 16h00
Spine: Spine and Neck rehabilitation 2	Tayla Ross	10-Apr	09h00 - 11h00
Spine: Spine rehabilitation Case Study	Tayla Ross	10-Apr	11h30 - 13h00
Spine: Back & Neck Revision Workshop	Tayla Ross	22-Sep	08h30 - 10h00
<b>Hip</b>			
Hip: Clinical and functional surface anatomy of the hip, thigh and pelvis	Tayla Ross	20-May	09h00 - 11h00
Hip: Clinical biomechanics and aetiology of common hip, pelvis and thigh injuries 1	Kim Murphy	20-May	11h30 - 13h30

Hip: Clinical biomechanics and aetiology of common hip, pelvis and thigh injuries 2	Kim Murphy	20-May	14h30 - 16h30
Hip: Hip/thigh/pelvis injury assessment	Kim Murphy	21-May	09h00 - 11h00
Hip: Rehabilitation of hip/thigh/pelvis injuries	Kim Murphy	21-May	11h30 - 13h30
Hip: Hip Rehab Case study	TBC	22-May	13h30 - 15h00
Hip: Hip/Pelvis Recap and feedback on hip/pelvis rehabilitation	Kim Murphy	23-Sep	10h30 - 12h00
<b>Knee</b>			
Knee: Clinical and functional surface anatomy of the knee and lower leg	Tayla Ross	27-May	09h00 - 11h00
Knee: Clinical biomechanics and aetiology of knee injuries 1	Avi Pursad	27-May	11h30 - 13h00
Knee: Clinical biomechanics and aetiology of knee injuries 2	Avi Pursad	27-May	13h30 - 15h00
Knee: Knee injury assessment	Avi Pursad	28-May	09h00 - 10h30
Knee: Knee injury rehabilitation	Avi Pursad	28-May	11h00 - 12h30
Knee: Knee Case study discussion & exercise examples	TBC	28-May	13h30 - 15h00
Knee: Knee Revision Workshop	Avi Pursad	22-Sep	13h00 - 14h30
<b>Shoulder</b>			
Shoul: Clinical and functional surface anatomy of the shoulder and upper limb	Tayla Ross	22-Jul	08h30-10h30
Shoul: Clinical Biomechanics & Aetiology of common shoulder injuries 1	Janine Gray	22-Jul	11h00 - 12h30
Shoul: Clinical Biomechanics & Aetiology of common shoulder injuries 2	Janine Gray	22-Jul	13h30 - 15h00
Shoul: Shoulder injury assessment	Janine Gray	23-Jul	08h30 - 10h30
Shoul: Shoulder injury rehab	Avi Pursad	24-Jul	09h00 - 10h30
Shoul: Shoulder Case study discussion & exercise examples	TBC	24-Jul	11h00 - 12h30
Shoul: Shoulder Recap and Feedback	Janine Gray	22-Sep	10h30 - 12h00
<b>Ankle and Foot</b>			
Ankle: Clinical and functional Anatomy of Ankle and Foot	CABA	4-Aug	08h30 - 10h30
Ankle: Clinical biomechanics and aetiology of the foot and ankle injuries 1	Kim Murphy	4-Aug	11h00 - 12h30
Ankle: Aetiology of common foot/ankle injuries: implications for rehab	Kim Murphy	4-Aug	13h30 - 15h00
Ankle: Foot/ankle injury assessment	Kim Murphy	5-Aug	09h00 - 10h30
Ankle: Rehabilitation of foot/ankle injuries	Kim Murphy	5-Aug	11h00 - 12h30
Ankle: Ankle Case Study Discussion	TBC	5-Aug	13h30 - 14h30
Ankle: Clinical biomechanical assessment of the lower limb, foot and ankle: Practical	Caroline D'Alton	6-Aug	09h00 - 10h30
Ankle: Clinical biomechanical assessment of the lower limb, foot and ankle: Practical (cont)	Caroline D'Alton	6-Aug	11h00 - 12h30
Ankle: Ankle Recap and Feedback	Kim Murphy	23-Sep	13h00 - 14h30
<b>EFWH</b>			
Arm: Clinical and functional Anatomy of arm & Wrist	Tayla Ross	2-Sep	08h30- 10h30
Arm: Clinical Biomechanics & Aetiology of common elbow, arm and hand injuries	Tayla Ross	2-Sep	11h00 - 12h30
Arm: Assessment of elbow, arm and hand injuries	Tayla Ross	2-Sep	13h30 - 15h00
Arm: Rehabilitation of hand injuries	Tayla Ross	3-Sep	09h00 - 10h30
Arm: Case study discussion	Tayla Ross	3-Sep	11h00 - 12h30

Arm: Elbow, Arm & Hand Revision Workshop	Tayla Ross	23-Sep	08h30 - 10h00
<b>III) BIOKINETICS PRACTICE</b>			
BioPrac: Scope of Biokinetics Practise	Neil Hopkins	14-Apr	14h00 - 15h30
BioPrac: ICD10 coding and implementation of the NHPRL	Avi Pursad	15-Apr	09h00 - 10h30
BioPrac: Rules and regulations, and practice ethics in Biokinetics practice	Neil Hopkins	15-Apr	11h00 - 13h00
BioPrac: Professional ethics in Biokinetics	Neil Hopkins	15-Apr	14h00 - 16h00
BioPrac: Introduction to rehab. modalities (theory)	Tayla Ross	16-Apr	09h00 - 10h30
BioPrac: Introduction to rehab. modalities (incl prac)	Tayla Ross	16-Apr	11h00 - 12h30
BioPrac: Entrepreneurship 1	Marius Cornelissen	16-Sep	09h00 - 10h30
BioPrac: Entrepreneurship 2	Marius Cornelissen	16-Sep	11h00 - 12h30
BioPrac: Developing a business plan and market research:	Neil Hopkins	17-Sep	09h00 - 10h30
BioPrac: Professional Communication	Neil Hopkins	17-Sep	11h00 - 12h30

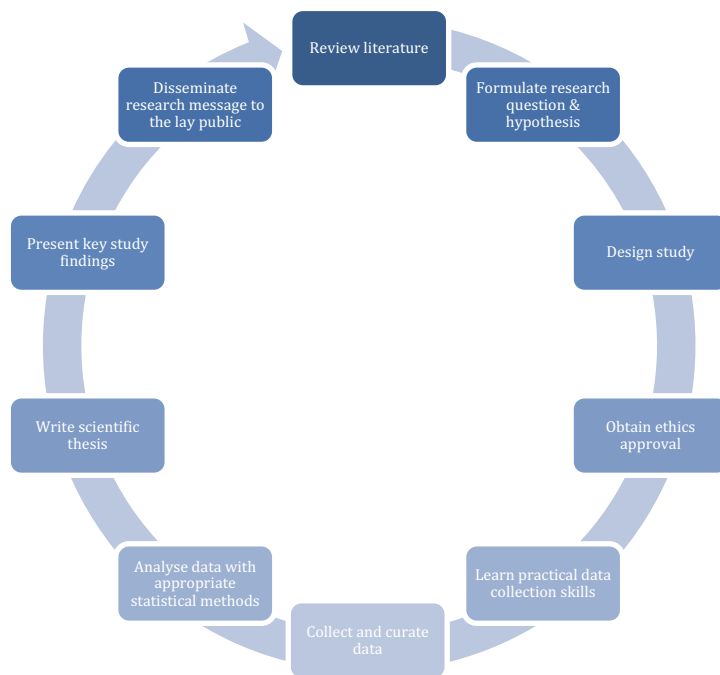
## Module 6: Research Methods and Biostatistics (RESE)

**Convenors: A/Prof Dale Rae**

This module will run from Friday 14 March to Monday 24 November 2025. We will typically meet on a Friday in Classroom 1 for lectures and tutorials. In addition to our weekly Friday sessions, we will have a dedicated Biostats week from 28 July – 1 August 2025. Students are also expected to attend the weekly HPALS Research Meetings (10h30-11h30, Classroom 1) as part of this module. The Journal Club is compulsory for the Exercise Science students, strongly encouraged for the new MSc/PhD students and optional for the Biokinetics students. The detailed schedule for this module is shown below.

### Objective

- To provide students with the necessary theoretical concepts and practical analytical skills to complete the lifecycle of a research study, beginning with formulating an appropriate research question through to communicating the key findings to a scientific and lay audiences.



Life Cycle of a Research Study

### Module Outcomes

After completion of this module, students should be able to:

- Develop a testable hypothesis designed to answer a scientific research question

- Critically evaluate scientific publications with regards to study design, statistical approach used, interpretation and strength of findings
- Understand common study designs to a test a scientific research question
- Understand the ethical considerations relating to human and animal research
- Think about appropriate questionnaires, tests or tools to collect data
- Demonstrate ability to collect and manage data
- Define, understand and be able to apply key statistical tests using SPSS (or similar software)
- Demonstrate ability to communicate key scientific findings through a written task and oral presentation

### Important Dates

Important dates	
<b>Mon 17 Feb</b>	Honours Research Project booklet released
<b>Mon 24 Feb</b>	Honours Research Projects showcase (13h00 – 14h00)
<b>Mon 3 Mar</b>	Students to submit Honours Research Project choices (17h00)
<b>Mon 10 Mar</b>	Assignment of Honours Research Projects
<b>Fri 11 Apr</b>	Honours Research Project Proposal presentations
<b>Fri 9 May</b>	Honours Research Project Proposals due (17h00)
<b>Fri 13 Jun</b>	Exercise Science students only: Literature Reviews due (17h00)
<b>Fri 22 Aug</b>	Research module assignment 1 due (17h00)
<b>Fri 5 Sep</b>	Research module assignment 2 due (17h00)
<b>Mon 3 Nov</b>	Honours Research Project Thesis due (17h00)
<b>Mon 24 Nov</b>	Honours Research Project Oral presentations

### Schedule

Terms 1 and 2			
Date	Time	Topic	Lecturer
14 Mar	09h00-10h00 11h45-12h45 14h00-16h00	Introduction to the research process 1 Introduction to the research process 2 Time management skills tutorial	Dale Rae Dale Rae Zulfah Albertyn-Blanchard
20 Mar	09h00-10h00 11h45-12h45 14h00-16h00	Study design Research protocol development Critical appraisal	Dale Rae Dale Rae Dale Rae
28 Mar	09h00-10h00 11h45-12h45 14h00-16h00	Ethical considerations 1 Ethical considerations 2 TRREE – module 1 (Introduction to Research Ethics)	Malcolm Collins Malcolm Collins Malcolm Collins
4 Apr	<b>Vac week</b>		
11 Apr	09h00-13h00	<b>Research project proposal presentations</b>	
18 Apr	<b>Good Friday</b>		



25 Apr	09h00-10h30* 11h45-12h45 14h00-16h00	Literature reviews: narrative, systematic and meta-analyses 1 and 2 TRREE – module 3 (Informed consent)	Dale Rae Malcolm Collins
9 May	09h00-10h30 11h45-12h45 14h00-15h30	Introduction to searching research literature databases Writing for research Introduction to EndNote	Gill Morgan Alison September Gill Morgan
16 May	17h00	<b>Research project written proposals due</b>	
23 May	09h00-10h30 11h45-12h45 14h00-15h00	Questionnaire development (Theory) 1 Questionnaire development (REDCap) 2 Questionnaire development (REDCap) 3	Dale Rae Dale Rae Dale Rae
30 May	09h00-10h0 11h45-12h45 14h00-15h00	Introduction to qualitative research methodology 1 Introduction to qualitative research methodology 2 <i>Journal club</i>	Mary-Ann Dove Mary-Ann Dove Dale Rae
6 Jun	09h00-10h00 11h45-12h45 14h00-15h00	Bridging research design and analysis 1 Bridging research design and analysis 2 <i>Journal club</i>	Dale Rae Dale Rae Dale Rae
13 Jun	09h00-10h00	<i>Journal club</i>	Dale Rae
20 Jun	09h00-10h00	<i>Journal club</i>	Dale Rae

Terms 3 and 4			
Date	Time	Topic	Lecturer
25 Jul	09h00-10h00 11h45-12h45 14h00-15h00	Variables, measures of central tendency, variability, descriptive statistics 1 and 2 <i>Curating data in spreadsheets tutorial</i>	Dale Rae Dale Rae
28 Jul-1 Aug	09h00-16h00	<b>Biostats week</b>	
8 Aug	09h00-10h00 11h45-12h45 14h00-15h00	<i>Reporting data and results tutorial</i> <i>Displaying data (graphing) for research tutorial</i> <i>Journal club</i>	Dale Rae Dale Rae Dale Rae
15 Aug	09h00-10h00 11h45-12h45 14h00-15h00	<i>Writing a Discussion tutorial 1</i> <i>Writing a Discussion tutorial 2</i> <i>Journal club</i>	Dale Rae Dale Rae Dale Rae
22 Aug	09h00-10h00 11h45-12h45 14h00-15h00	<i>SPSS tutorials: Integrated biostats 1</i> <i>SPSS tutorials: Integrated biostats 2</i> <i>Journal club</i>	Dale Rae Dale Rae Dale Rae
29 Aug	09h00-10h00 11h45-12h45 14h00-15h00	<i>SPSS tutorials: Integrated biostats 3</i> <i>SPSS tutorials: Integrated biostats 4</i> <i>Journal club</i>	Dale Rae Dale Rae Dale Rae
5 Sep	09h00-10h00 11h45-12h45 14h00-15h00	<i>SPSS tutorials: Integrated biostats 5</i> <i>SPSS tutorials: Integrated biostats 6</i> <i>Journal club</i>	Dale Rae Dale Rae Dale Rae

## Biostats Week

	Mon 28 Jul	Tue 29 Jul	Wed 30 Jul	Thurs 31 Jul	Fri 1 Aug
<b>09h00-10h30</b>	Introduction to probability testing, exploring data (DR)	ANOVA: one-way, two-way and with covariance (DR)	Correlation and limits of agreement (DR)	Simple linear regressions (KL)	Logistic regression analyses (DR)
<b>10h30-11h00</b>	<b>Break</b>				<b>HPALS meeting</b>
<b>11h00-12h30</b>	Two-group comparisons: t-tests (DR)	Repeated measures ANOVA (DR)	Typical error of measurement, effect size and smallest worthwhile change (DR)	<i>SPSS tutorial: Simple linear regressions (KL)</i>	<i>11h30-13h00</i> <i>SPSS tutorial: Non-parametric stats (DR)</i>
<b>12h30-13h30</b>	<b>Lunch</b>				
<b>13h30-16h00</b>	<i>SPSS tutorial: Exploring data, t-tests (DR)</i>	<i>SPSS tutorial: ANOVAs (DR)</i>	<i>SPSS tutorial: Correlations and effect sizes (DR)</i>	Non-parametric statistics (DR)	<i>SPSS tutorial: Logistic regressions (DR)</i>

## Ethics

Each student is required to submit their TRREE Training Certificate for both the Introduction to Research Ethics and Informed Consent modules via Vula as proof of having completed and passed the modules. This is a DP requirement for this module.

## Journal Club

Journal club is compulsory for the Exercise Science students but optional for all other students. The aim is to help students learn to critically appraise scientific research. Sessions will be led by Prof Mike Lambert. In addition to traditional journal article discussions, students will discuss how to review journal articles. They will also then have the opportunity to actually review articles as well as get involved with some of SSISA's High Performance Centre activities.

## Assessment

The overall module mark is comprised of the following components:

Research project proposal presentation	30%
Research project written proposal	40%
Research module assignment 1	15%
Research module assignment 2	15%

### Research Project Proposal Presentation (Friday 11 April 2025)

These are oral presentations in which each student will have 10 minutes to present their Research Proposal, with 5 minutes for questions. Students should make use of presentation software like PowerPoint, KeyNote, Prezi, Canva or similar. The presentation should include sections on: Background, Aim, Methods (Study design, participants, data collection tools and procedures, planned statistical analysis approach), Time frame. Apart from having the opportunity to practice presentation skills, a key outcome of this process is for students to integrate feedback from staff and fellow students on their design to strengthen their written project proposal.

### Research Project Proposal (due: Friday 9 May 2024, 17h00)

Each student is required to submit a written research project proposal. Proposals must follow the format required for research proposals submitted to the Faculty of Health Science's Human Research Ethics Committee. Guidelines for submissions are available [here](#) and students will be assisted in this process before handing in. There is no word limit / requirement but students are encouraged to be concise. These are the required sections:

- Introduction: Build a clear case for the research study
- Purpose: Clearly articulate the study aims, objectives and hypotheses
- Methods: Study design, overview and setting; participants (including recruitment, inclusion and exclusion criteria; detailed study procedures; data and statistical analyses.
- Ethical considerations: Potential risks and discomforts, potential benefits to participants, informed consent process, privacy and confidentiality, participant reimbursement, emergency care and insurance
- Timeframe
- References
- Appendices

Proposals (single pdf document) are to be emailed to Ms Ayesha Hendricks by 17h00 on the due date. Late submissions shall incur a 5% penalty. Proposals handed in more than 48h after the submission deadline will not be marked.

**Research module assignments (due: Friday 22 August and Friday 5 September 2024, 17h00)**

As part of continuous assessment, students will be required to submit two assignments based on the theory aspects of the module. The assignments are designed to simulate the Results and Discussions section of a thesis, in order to help students with the skills needed to write their theses. Students will be guided through this process in tutorials ahead of the submission deadlines.

**Research Module Test (Wednesday 15 October 2025, 09h00-13h00)**

Students will write a test to assess their (i) understanding of the theory underpinning research design and biostatistics and (ii) ability to interrogate and interpret the Methods, Results and Discussion/Conclusions sections of a scientific journal article. The test will be 3h (70 marks), allowing for 1h of reading time and 2h to answer the questions.

**Research Project Thesis (Due: Monday 3 November 2025, 17h00)**

Each student will prepare and submit a small written thesis relating to their research project. The format shall be that of a manuscript to be submitted to a scientific journal for publication. Together with the supervising team, the student should select the most appropriate journal for their “thesis manuscript”, and follow the guidelines with regards to structure, word count, style, format for tables and figures, references etc. Additional material such as consent forms, questionnaires or other tools used in data collection may be included as Appendices. The students should also include the Author Instructions for the journal for which their thesis has been prepared as an Appendix. Each thesis needs to contain a Plagiarism declaration and a Turnitin report. Theses (single pdf document) should be emailed to Ms Ayesha Hendricks by 17h00 on the due date. Late submissions shall incur a 5% penalty. Theses handed in more than 48h after the submission deadline will not be marked.

## **Research Project Final Oral Presentations (Monday 24 November 2025)**

Finally, students will communicate the most important aspects of their Research Projects through an oral presentation delivered to staff, colleagues, parents and peers. Students should prepare a 12 minute scientific presentation which comprises Introduction, Methods, Results and Conclusions sections and be prepared to respond to questions (3 minutes) from the audience.

### **TEXTBOOKS AND REFERENCE MATERIALS**

The following text books are available in Ayesha's office and can be signed out as needed. Note, students are not allowed to have the text books for more than 4 consecutive days, as we have limited copies and would like all the students to have equal opportunity to use the books.

**ACSM's Exercise Management For Persons With Chronic Diseases And Disabilities**, 10<sup>th</sup> & 11<sup>th</sup> Edition, Lippincott Williams & Wilkins, 2009. ISBN 978-0-7817-6903-7

**Biomechanics of the Musculo-skeletal System** 3<sup>rd</sup> Edition, BM Nigg, W Herzog, 2007. ISBN 13:978-0-470-01767-8

**Clinical Exercise Physiology**, 2<sup>nd</sup> Edition. JK Ehrman, PM Gordon, PS Visich, SJ Keteyian, 2009. ISBN 13: 978-0-7360-6565-8

**Clinical Sports Medicine** 4<sup>th</sup> Edition, P. Brukner, K. Khan, ISBN 9780070998131 (hbk)

**Joint Structure And Function** 4<sup>th</sup> Edition, PK. Levangie, C. Norkin, 2005. ISBN0-8036-1191-9

**Mosby's dictionary of medicine** C. Brooker, 2010. ISBN978-7234-350404

**Muscles (Testing and function)** 5<sup>th</sup> Edition, FP. Kendall, EK Macreary, PG Provance, MM Rodgers, WA Romani, 2005. ISBN0-7817-4780-5

**Orthopaedic physical assessment** 4<sup>th</sup> Edition, DJ. Magee, 2006. ISBN10:1-4160-3109-X, ISBN 13: 978-1-4160-3109-3

**Pathophysiology** 3<sup>rd</sup> Edition, Tomas J. Nowak, A. Gordon Handford, 2004. ISBN 0-07-027255-7

**Rehabilitation techniques for Sports Medicine & Athletic Training**, WE Prentice, 2011. ISBN978-007-128953-5

**Statistics in Kinesiology** 3<sup>rd</sup> Edition, WJ Vincent 2005. ISBN 0-7360-5792-7

**The Olympic textbook of science in sport**. Vol. XV Of Encyclopaedia of Sports Medicine, RJ Maughan, 2008. ISBN 978-1-4051-5638-7

## Course Textbooks

**Clinical Exercise Physiology**, 2<sup>nd</sup> Edition. JK Ehrman, PM Gordon, PS Visich, SJ Keteyian, 2009. ISBN 13: 978-0-7360-6565-8

**Clinical Sports Medicine** 4<sup>th</sup> Edition, P. Brukner, K. Khan, ISBN 9780070998131 (hbk)

In addition to the suggested textbooks for the modules, each module will include pertinent reference material. The lecturers will give out these references either prior or during their lectures. Most of this reference material is available in either the Unit's Resources Centre or in the UCT's Medical Library.

The following books are useful reference materials:

1. **Metabolic Regulation. A Human Perspective**, 2<sup>nd</sup> edition, K.N. Frayn, Blackwell Science Inc., 2003. ISBN 0 632 06384 X
2. **Statistics in Kinesiology**, 2<sup>nd</sup> edition, W.J. Vincent, Human Kinetics, 1999. ISBN 0 7360 0148 4
3. **Lore of Running**, 4<sup>th</sup> edition, T.D. Noakes, Oxford University Press, Cape Town, 2001. ISBN 0 19 578 016 7
4. **Biochemistry of Exercise and Training**, R. Maughan, M. Gleeson, P. Greenhaff, Oxford University Press, 1998. ISBN 0 19 262741 4
5. **Physiological Testing of the High Performance Athlete**, 2<sup>nd</sup> Edition, J.D. MacDougall, H.A. Wenger and H.J. Green, Human Kinetics Publishers, 1991. ISBN 0 87 322300 4
6. **Exercise in Health and Disease: Evaluation and Prescription for Prevention and Rehabilitation**, 2<sup>nd</sup> edition, M.L. Pollock and J.H. Wilmore, WB Saunders Company, 1990. ISBN 0 72162948 2
7. **Anatomy & Human Movement Structure and Function**, 3<sup>rd</sup> edition, N. Palastanga, D. Field and R. Soames, Butterworth Heinemann, 1998. ISBN 0 75 063268 2
8. **Joint Structure & Function – A comprehensive analysis**. C.C. Norkin, P.K. Levangie, F.A. Davis Company, 2005. ISBN: 0803611919
9. **Muscle Testing and Function – With posture and pain**, 5<sup>th</sup> Edition. F.P. Kendall, E.K. McCreary, P.G. Provance, Lippincott Williams and Wilkins, 2005. ISBN: 0781747805
10. **Orthopedic Physical Assessment**, 4<sup>th</sup> Edition, D.J. Magee, Saunders, 2005. ISBN: 0721693520
11. **ACSM's Exercise Management for Persons with Chronic Disease and Disabilities**, 2<sup>nd</sup> Edition J.L. Durstine, G.E. Moore, Human Kinetics, 2003. ISBN: 0736038728
12. **Rapid Interpretation of EKG's** D. Dubin, Cover Publishing Company, 2000. ISBN: 0912912065
13. **Pathophysiology: Concepts & Applications for Health Care Professionals**, 3<sup>rd</sup> Ed T.J. Nowak, A.G. Handford, McGraw-Hill, 2005. ISBN: 0070272557
14. **MIMS- Drug Reference Handbook**, 4<sup>th</sup> Ed, Reuters, 2022.

## HPALS STAFF LIST

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## IMPORTANT DATES 2025

HONOURS BIOKINETICS IMPORTANT DATES 2025	
FIRST SEMESTER	
29 – 31 Jan	ORIENTATION
3 Feb – 14 Feb	FUNDAMENTALS
17 – 28 Feb	EXERCISE PHYSIOLOGY TECHNIQUES
24 Feb	FUNDAMENTALS TEST
3 – 4 Mar	BLS
5 – 7 Mar	BIOMECHANICS
10 – 28 Mar	HEALTH PROMOTION MODULE
10 Mar – 31 Oct	CLINICAL ROTATIONS START AND END DATE
29 Mar - 6 Apr	TERM 1 HOLIDAY
7 – 11 Apr	ORTHO NECK AND BACK WEEK
14 – 17 Apr	BIO PRAC WEEK
14 Apr	HP MODULE TEST
22 Apr – 16 May	CHRONIC DISEASES MODULE
19 - 23 May	ORTHO HIP
26 - 30 May	ORTHO KNEE
9 Jun	THEORY EXAM 1
17 & 18 Jun	CLINICAL EXAM 1
19 Jun - 20 Jul	TERM 2 HOLIDAY

<b>HONOURS BIOKINETICS IMPORTANT DATES 2024</b>	
<b>SECOND SEMESTER</b>	
21 – 25 Jul	ORTHO SHOULDER
28 Jul – 1 Aug	STATS WEEK
4 – 8 Aug	ORTHO ANKLE
11 – 29 Aug	NEMS MODULE
1 – 5 Sep	ORTHO ARM AND WRIST
6 – 14 Sep	TERM 3 HOLIDAY
15 – 19 Sep	BIOPRAC & CLINICAL REASONING
15 Sep	NEMS ASSIGNMENT
22 – 23 Sep	REVISION WEEK
29 Sep	THEORY EXAM 2
7 & 8 Oct	CLINICAL EXAM
15 Oct	RESE EXAM
3 Nov	HONS PROJECT HAND IN
12 & 13 Nov	FINAL CLINICAL EXIT LEVEL EXAM
24 Nov	HONS PROJECT PRESENTATIONS