



UNSW
AUSTRALIA

Medical Sciences
Medicine

Exercise Physiology Program

HESC2501

Exercise Physiology

Semester 2, 2015
Course Outline

CRICOS Provider Code 00098G

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Please read this outline in conjunction with the following pages on the [School of Medical Sciences website](#):

- [Advice for Students](#)
- [Learning Resources](#)

(or see "STUDENTS" tab at medicalsciences.med.unsw.edu.au)

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Course details

Credit Points: 6 UOC

Course Prerequisites / Assumed Knowledge

BIOC2181 Fundamentals of Biochemistry; PHSL2501 Human Physiology A

Course Description

The focus of this course is on the physiological adaptations of the respiratory, cardiovascular, endocrine and musculoskeletal systems to acute and chronic exercise, building on knowledge and skills developed in Human Physiology A and concurrently developed in Human Physiology B. Specific adaptations to the different component of exercise (intensity, duration, type) will be presented. Skills and techniques used to monitor and analyse those adaptations will be developed throughout this course e.g. submaximal and maximal exercise tests, ECG, spirometry.

Aims of the Course

1. To encourage a comprehensive understanding of the human physiological response (energy utilisation, endocrine, cardiovascular, respiratory, musculoskeletal) to both acute and repeated bouts of exercise
2. To provide knowledge of measurement principles and techniques commonly utilised in exercise physiology
3. To provide confidence in performing basic measurements in exercise testing

Student Learning Outcomes

This course will enable students to explore and gain further understanding of the response of the human body to physical activity with an emphasis of their application to real situations in the field of Exercise Physiology. This course provides the fundamental knowledge and promotes the development of skills which will work towards the realisation of the overall Bachelor of Exercise Physiology program objectives and skills of an Exercise Physiologist.

At the end of the course you should be able to:

- Have developed knowledge of the changes in energy utilisation, endocrine, cardiovascular, respiratory and musculoskeletal systems in response to acute or repeated bouts of exercise.
- Demonstrate basic competencies in skills associated in exercise testing (eg. heart rate and blood pressure measurement; the collection of blood by fingerprick for the analysis of lactate).
- Communicate effectively through written reports of scientific laboratory experiments.

Graduate Attributes

- Understand the relationship between physical activity and health
- Apply clinical skills and knowledge relevant to health and fitness assessments
- Engage in independent and reflective learning for the betterment of professional practice, following an evidence-based approach
- Work as a member of a team and as a leader of a team
- Communicate effectively with patients, colleagues and other health professionals

Rationale for the inclusion of content and teaching approach

How the course relates to the Exercise Physiology profession – The content allows students to develop a fundamental knowledge of the human physiological response to physical activity. This forms the basis upon which further knowledge and skills enable an Exercise Physiologist to deliver lifestyle programs that use exercise with an aim of promoting disease prevention and rehabilitation of chronic disease. This course also enables students to develop the skills of communication and critical thinking. It reflects the position of the course convenor that their practice within the field will require these skills for ongoing development.

How the course relates to other courses in the Exercise Physiology program – The course will build upon material presented in earlier courses in the program, in particular Introductory Exercise Science (HESC1501), Exercise Programs and Behaviour (HESC1511), as well as Human Physiology A (PHSL2501). The skills and knowledge developed in this course will provide a strong base in exercise physiology essential for the clinically oriented courses offered in third stage such as Physical Activity and Health (HESC3504) and Clinical Exercise Physiology (HESC3541).

Teaching strategies

Lectures – Lectures are considered by the course convenor to be only a summary of the concepts and theory essential for meeting the course objectives and student learning outcomes outlined above. In order to do well in this course it is essential that students make use of other resources, such as the recommended and additional textbooks (page 12) and Web-based resources. Lecture notes will be made available in PDF format on Moodle prior to each lecture. Lecture audio and slides are recorded and can be replayed using ECHO360 on Moodle.

There are 31 lectures + 2 review sessions (each 1 hour) in this subject.

Laboratories – Labs are designed to help you to develop technical skills that will be relevant in your professional career, and to apply experiments to demonstrate and reinforce key theoretical concepts that have been covered in lectures. Lab notes will be available to download from Moodle at least 1 week prior to each lab. Students are required to bring a printed copy of the lab notes, and expected to have read the lab notes prior to the lab. Attendance at ALL labs is compulsory and attendance will be marked.

Lab expectations: Students are expected to behave in an ethical, socially responsible and professional manner within the laboratory class. Punctual arrival is expected as important information including safety precautions are discussed at the beginning of each class and late students will be refused entry and marked as absent. Turn-off mobile phones before entering (mobile phones are not to be used or answered during the class). The use of computers for work not related to the current laboratory is not permitted in class. Eating is not permitted, however students may bring water.

All students must come prepared for active participation wearing clothing which is suitable for exercise (e.g. shorts or track pants, T-shirt or light sweater, and running shoes). Enclosed footwear is compulsory. Students who are not dressed appropriately for the lab (e.g. open footwear) or do not have a legitimate reason for not participating (eg. medical complaint or injury) will be refused entry to the class and will then be marked absent. Students must take care with biological and hazardous material and leave all equipment clean and functional. Students who do not adhere to these basic laboratory rules will be marked absent.

There are 8 labs (each 2 hours) in this subject; including 5 large-group (~50 students) labs and 3 smaller-group (~8 students) labs.

Resources for students

See also [Learning Resources](#) on the SoMS website.

Textbook

McArdle WD, Katch FI, Katch VL (2014) Exercise Physiology. Energy, nutrition and human performance. (8th edition) Lippincott, Williams and Wilkins. Philadelphia, USA. (The 7th edition would be suitable, too)

Lecture Readings

Lecture Block 1 (Biochemistry & Nutrition) – chapters 1-11

Lecture Block 2 (Cardiovascular & Respiratory) – chapters 12-17

Lecture Block 3 (Muscle function and exercise training) – chapters 18, 21-23

Lecture Block 4 (Exercise considerations) – chapters 24-25, 31

Recommended for Labs

Coombes, J. & Skinner, T. (2014). ESSA's Student Manual for Health, Exercise and Sport Assessment. Elsevier. Sydney, Australia.

This text will be useful for many lab sessions conducted throughout the Exercise Physiology degree, and is also available in the UNSW library.

Other Suggested Reference Books

- **American College of Sport Medicine. (2010).** ACSM's health-related physical fitness assessment manual. 4th ed. Lippincott, Williams and Wilkins, Philadelphia, USA.
- **American College of Sport Medicine. (2013).** ACSM guidelines for exercise testing and prescription. 9th ed. Lippincott, Williams and Wilkins, Philadelphia, USA.
- **Australian Institute of Sport. (2013).** Physiological tests for elite athletes. 2nd ed. (Gore CJ. Editor) Human Kinetics, Champaign.IL., USA.
- **Bourke L & Deakin V. (2010).** Clinical Sports Nutrition. 4th ed. WCB/McGraw-Hill, Boston, USA.
- **Brooks GA, Fahey TD, White TP, & Baldwin KM. (2008).** Exercise Physiology: Human Bioenergetics and its applications. 4th ed. Mayfield Publishing Company, Mountain View, CA., USA.
- **Hampton JR. (2013).** The ECG made easy. 8th ed. Churchill Livingstone, Edinburgh, UK.
- **Houston ME. (2012).** Biochemistry primer for Exercise Science. 4th ed. Human Kinetics, Champaign IL, USA.
- **Kenney WL, Wilmore JH, & Costill DL. (2011).** Physiology of Sport and Exercise. 5th ed. Human Kinetics, Champaign.IL., USA.
- **Powers SK & Howley ET. (2011).** Exercise Physiology. (8th edition) WCB/McGraw-Hill, Boston, USA.
- **Robergs RA & Keteyian SJ. (2007).** Fundamentals of Exercise Physiology. 2nd ed. WCB/McGraw-Hill, Boston, USA.

Other articles will be included in notes from individual lecturers and/or in the Resources section on Moodle.

Assessments

These tasks have been chosen as tools to enhance and guide your learning as well as a way of measuring performance, and are therefore a central teaching strategy in this course.

	Weight	Date
ASSESSMENT TASK 1 – MID SEMESTER EXAM	20%	Week 5
ASSESSMENT TASK 2 – END OF SESSION EXAM	40%	End semester exam period
ASSESSMENT TASK 3 – LABORATORY ASSIGNMENT	15%	Week 9
ASSESSMENT TASK 4 – OSCE	25%	Weeks 12 & 13

Assessment Task 1 – MID SEMESTER EXAM

The MID SEMESTER EXAM is a written exam comprised of multiple choice and short answer questions, and analytical interpretation of typical experimental situations. It will cover lecture and laboratory material from weeks 1-4. It will be held in week 5 during the lecture timeslot, and is 50 minutes duration (writing time). In the weeks prior to the mid-semester exam students will be allocated an examination room (TBA) to allow for adequate spacing between students. No extra time will be given to a student who has arrived at the wrong room and needs to find their way to the other room to sit the exam. Students are only permitted to leave the room after they have submitted their mid-semester exam for assessment.

Assessment Task 2 – END OF SESSION EXAM

The END OF SESSION EXAM is a written exam comprised of multiple choice and short answer questions, and analytical interpretation of typical experimental situations. It will be held during the examination period following the end of semester, and will cover ALL lectures and laboratory material from the ENTIRE semester.

Assessment Task 3 – LABORATORY ASSIGNMENT

The goal of the laboratory report is to enable and consolidate learning by 'doing'. Assessing this learning can enhance:

1. Conceptual understanding of the theory-practice relationship;
2. Higher level reasoning skills; and
3. Development of exercise physiology practical competence.

Items 1 and 2 are assessed through the laboratory report writing, and item 3 is assessed through the OSCE.

You have to submit **2 lab reports: one is a 'practice' assignment** used for feedback only; **the other assignment contributes to your course grade**. Each report has a word limit of 2000 words, excluding bibliography and figures/tables.

The 'practice' assignment will cover Laboratory 1 (Wingate testing in week 1). This assignment is to be submitted in week 3. Students will receive feedback on this assignment. Students are then required to provide a summary from their feedback as to the improvements they plan to implement on the next Laboratory report. This assignment will not contribute to your course grade, but a

satisfactory submission is mandatory in order to be allowed to submit the subsequent, graded assignment.

The graded assignment will cover either Laboratory 2, 3, 5 OR 6. You are allowed to choose which lab to write up. This assignment is to be submitted in week 9.

Lab content will also be assessed in the OSCE (practical skill competency) and the Final Exam (knowledge and application competency).

Marking Criteria for Laboratory Assignments

To achieve the highest possible marks you must do the following:

Title Page:

- Indicate the Laboratory number and title of the laboratory report. Provide your name, student number and unit code: HESC 2501.

Introduction:

- Must introduce and provide adequate background material on the key concepts related to the laboratory testing. It may also include previous research that has occurred in the topic.
- All explanations of key terms and concepts must be referenced using credible scientific journals. Textbooks are also useful for explaining key concepts. Avoid referencing lecture notes, the lecturer and non-peer reviewed material on the internet.
- At the end of the introduction, a clear and concise aim must be provided that outlines the purpose of the laboratory.

Methods:

- Must be included in the report, which outlines the procedural steps you took to collect the data for the report. This section should be written in paragraphs (rather than bullet-points) to assist with procedural clarity.
- Please do not copy the laboratory manual. This document is a guide. By using your own terminology, it will demonstrate that you understand the procedures.
- Ensure adequate detail is provided in a scientific style, so that any person repeating the laboratory could do so, by following your procedures.
- As the procedure has already been conducted, the method needs to be written in the past tense.

Results:

- Participant details and demographics need to be placed at the start of the results section.
- Tables and figures need to be completed with the numerical data obtained in class, with clearly labelled headings, units of measurement and axis labels.
- Data provided needs to be relevant and concise.
- Answers to any additional numerical calculations need to be completed and entered in the appropriate space provided in the table.
- Prior to each table or figure, you must provide a description or summary of the key findings from the results. These key results set up the basis to the discussion section.

Discussion & Conclusion:

- The discussion is the most important component of the laboratory report.
- The discussion should commence by outlining the key finding from the results section.
- Relate the key findings to the original purpose of the laboratory.
- It is then necessary to put the results into perspective and provide meaning. This enables students to demonstrate that they understand the concept being tested and can interpret and explain the finding. Aspects could include:

- How did your participants' results compare to the group mean, and also to similar testing results in the literature? This is a way of confirming the accuracy of your results from the laboratory.
- Who performed the strongest, whose data indicates poor aerobic capacity and the reasons that could account for the results?
- Were there unexpected results? Was there experimental error that may have accounted for the findings? How could the experimental errors be corrected next time?
- How did your results compare to similar testing results in the literature? This is a way of confirming the accuracy of your results from the laboratory.
- Can you identify possible implications of your results? Does the data suggest the participant is better suited to a particular sport as he or she excels in a physiological capacity?
- Discussion needs to be concise, to the point, contain the underlying physiology and grammatically correct.
- Finally, a concluding statement needs to summarise the major finding/s from the report.

Referencing and attention to detail:

- Particular attention and marks will also be given to correct referencing within the document (see APA referencing guidelines).
- You need to provide the correct reference within the discussion section
- A full reference list needs to be provided at the end of the assignment. Attention will be made towards the relevance of the reference source, use of peer reviewed journal articles, how current the journal article is and the journal source.
- You will also need to ensure the report is grammatically correct with correct spelling and units throughout (please use spell check and grammar check)
- The lab report need to demonstrate a professional, scientific presentation, with attention paid to detail, design and layout.

Referencing for the laboratory assignment

Referencing is a process that identifies the sources of information used in your assignment. Some of the main purposes of referencing are: to justify/support the position you take in your assignment, to show the arguments put forward by different writers, and to allow the reader to locate the sources used. Please refer to examples cited below. Further information can be found at <http://www.apastyle.org>

Submission of Assignments

Laboratory assignments are to be submitted via MOODLE (TurnItIn) **by 9:00am** on the due date.

Penalties for late submission of assignments – In cases where an extension has NOT been granted, the following penalties will apply:

- For laboratories submitted after **9.00am** on the due date, a penalty of 50% of the maximum marks available for that assignment will be incurred.
- Assignments received two (2) or more days after the due time/date **will not be allocated a mark**, however, these assignments **must** still be submitted to pass the unit.

Examination procedures and attendance requirements

Attendance is expected at all lectures and labs for this course. Attendance at all labs will be recorded. Students who do not participate in these sessions, for any reason other than medical or misadventure, will be marked absent and will be awarded a grade of FAIL for the entire course. If absent for medical reasons, a medical certificate must be lodged with the course convenor within 7 days of the time period of the certificate's expiry. No consideration will be given after this time.

Table 1: Marking criteria for assignments submitted in HESC2501

Assignment Marking Criteria	Not satisfactory	Developing (Not Yet Competent)	Competent	Good	Advanced
	0%	25%	50%	75%	100%
Introduction (20 marks) <ul style="list-style-type: none"> Explain the key concepts being studied, with regard to the relevant underlying physiology. Review the relevant literature – detail findings from directly relevant previous research on the topic, and from credible scientific journals. State the aim and hypotheses of the lab. 	<ul style="list-style-type: none"> Unable to explain any concepts relevant to the lab. Unable to review any literature. Unable to state an aim and hypotheses. 	<ul style="list-style-type: none"> Inadequate explanation of the key concepts relevant to the lab. Inadequate review of some relevant research, or provided largely irrelevant references. Unclear aim and hypotheses were stated. 	<ul style="list-style-type: none"> Basic explanation of the key concepts relevant to the lab. Basic review of some relevant research. Basic aim and hypotheses were stated. 	<ul style="list-style-type: none"> Explained key concepts relevant to the lab. Good review of relevant research. Clear aim and plausible hypotheses were stated. 	<ul style="list-style-type: none"> Clear, concise, and focused explanation of all key concepts relevant to the lab. Clear, concise, comprehensive and focused review of relevant research. Clear, concise, and focused aim and hypotheses were stated.
Methods (15 marks) <ul style="list-style-type: none"> Procedures explained in adequate detail to enable replication of the entire task by an independent researcher, and are written scientifically (not copied from the lab manual). 	<ul style="list-style-type: none"> Unable to write procedures, or did not paraphrase the lab notes. 	<ul style="list-style-type: none"> Inadequate procedural steps or lacking key detail to enable task replication, or largely inadequate paraphrasing. 	<ul style="list-style-type: none"> Basic procedural steps or lacking some detail to enable task replication. 	<ul style="list-style-type: none"> Clear procedural steps that would enable task replication. 	<ul style="list-style-type: none"> Clear, concise, comprehensive and focused detail of the procedural steps that would enable task replication.
Results (25 marks) <ul style="list-style-type: none"> Summarise the key data (i.e. describe the data in the tables / figures) (10) Present the key data (participant characteristics and key test results) – data is relevant, correct and appropriately presented (e.g. in tables / figures). 	<ul style="list-style-type: none"> Unable to summarise any data. Irrelevant and/or incorrect data and/or unable to present data in tables / figures. 	<ul style="list-style-type: none"> Inadequate, overly-brief or inconsistent summary of the key data. Some irrelevant and/or incorrect data or missing key data, and/or presented in inadequate tables / figures. 	<ul style="list-style-type: none"> Basic summary of the key data. Mostly relevant and correct data presented in basic tables / figures (including labelling). 	<ul style="list-style-type: none"> Clear summary of the key data. Relevant and correct key data presented in good tables / figures. 	<ul style="list-style-type: none"> Clear, concise and focused summary of the key data. Relevant and correct key data presented in well-designed tables / figures.
Discussion & Conclusion (25 marks) <ul style="list-style-type: none"> States the key findings (expected and/or unexpected) from the data. Explains and 'makes sense' of the findings for the reader, with regard to the relevant underlying physiology. Compares findings to previous research / group data (e.g. from the Introduction). (5) Implication(s) of the findings (e.g. for science or clinical applications). Final statement (Conclusion) summarizing the study and the major finding(s). 	<ul style="list-style-type: none"> Unable to identify any findings from the data. Unable to explain & 'make sense' of the key findings. Unable to compare own findings to previous literature and group data. Unable to discuss any implication of the findings. Unable to provide a conclusion. 	<ul style="list-style-type: none"> Inadequate statement of findings (expected or unexpected) from the data. Inadequate explanation which did not clearly 'make some sense' of the findings. Inadequate comparison of own findings to previous literature and group data. Inadequate discussion of the implication of the findings. Inadequate or unclear conclusion 	<ul style="list-style-type: none"> Basic statements of key findings (expected or unexpected) from the data. Basic explanations with limited interpretation to 'make sense' of the key findings. Basic comparison of own findings to previous literature and group data. Basic discussion of the implication of the findings. Basic conclusion 	<ul style="list-style-type: none"> Clear statements of key findings (expected or unexpected) from the data. Clear explanations with interpretation to 'make sense' of the key findings, being critical of own methodology. Clear comparison of own findings to previous literature and group data. Clear discussion of the implication of the findings. Clear conclusion. 	<ul style="list-style-type: none"> Clear, concise and focused statements of key findings (expected or unexpected) from the data. Clear, concise, comprehensive and focused explanations with in-depth interpretation to 'make sense' of the key findings, being critical of own methodology. Clear, concise and focused comparison of own findings to previous literature and group data. Clear, concise and focused discussion of the implication of the findings. Clear, concise and focused conclusion.
Other (Referencing, Language and Presentation) (15 marks) <ul style="list-style-type: none"> Appropriate Reference section (APA format) and referencing of statements in the body of the report. Overall presentation, writing quality and attention-to-detail e.g. correct grammar, spelling and punctuation, consistency in presentation (line spacing, paragraphing etc.), correct units and use of past tense. 	<ul style="list-style-type: none"> Unable to reference, either within text or a Reference section. Extremely poor overall presentation, writing quality and attention-to-detail. 	<ul style="list-style-type: none"> Inadequate referencing, either within text or in the Reference section. Inadequate overall presentation, writing quality or attention-to-detail. 	<ul style="list-style-type: none"> Some appropriate and correct referencing within text and in the Reference section. Basic overall presentation, writing quality and attention-to-detail. 	<ul style="list-style-type: none"> Mostly appropriate and correct referencing, both within text and in the Reference section. Good overall presentation, writing quality and attention-to-detail. 	<ul style="list-style-type: none"> Completely appropriate and correct referencing, both within text and in Reference section. Advanced-level overall presentation, writing quality and attention-to-detail.

Assessment Task 4 – OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

The OSCE will be held in weeks 12 & 13 during the small group laboratory. It will assess the student's ability to perform various practical skills commonly applied in clinical exercise physiology. Each student will be required to attend on only one of these weeks. Further information confirming the location and times of the skills exam for each individual student will be provided in the weeks prior to the exam by the course convenor. Where possible, the assessment environment will mimic real-life practice and you will need to treat the station as such.

EACH student will be required to perform a range of skills (listed in the table below), under the supervision of an examiner. Broadly, the assessment covers three categories:

(1) *exercise physiology competency*

- a. able to correctly conduct test / assessments using protocols taught in this course and identify criteria for test completion or test termination
- b. able to execute a test / assessment by performing the tasks in a logical sequence
- c. able to monitor the client throughout the test / assessment, ensuring client safety

(2) *technical skill*

- a. able to correctly use all equipment required in testing
- b. able to correctly set up a client for testing
- c. able to identify equipment safety issues, ensuring client safety (and the following of OHS guidelines), and able to propose alternative strategies to conduct the test if equipment fails

(3) *communication skills*

- a. able to effectively communicate verbally to the client
- b. able to establish a good rapport with the client
- c. able to explain testing procedures to a client and check their understanding
- d. able to explain the results to the client in a manner that the client can understand

The exam venue will be divided into 8 stations. Some exercise physiology skills which could be assessed for competency during the OSCE include:

Skill Area	Competencies - students need to be able to demonstrate an ability to:
<i>Cardiovascular Function Assessment</i>	<ul style="list-style-type: none"> • perform a manual and electronic measurement of resting & exercise heart rate. • perform a measurement of resting & exercise systolic and diastolic blood pressure • interpret and explain the results to the subject
<i>Blood Collection and Blood Lactate Assessment</i>	<ul style="list-style-type: none"> • perform the collection of blood from a subject by finger-prick following an exercise bout and examine the sample for blood lactate • interpret and explain the results to the subject • perform all tasks following the rules governing safe handling of blood and sharps disposal
<i>Respiratory Function Assessment</i>	<ul style="list-style-type: none"> • perform a measurement of vital capacity and FEV_{1.0} • interpret and explain the results to the subject
<i>Aerobic Capacity Assessment</i>	<ul style="list-style-type: none"> • correctly set up a subject on a Monark bicycle ergometer in preparation for exercise • correctly attach and fit a heart rate monitor to the subject prior to commencing the test • explain a sub-maximal aerobic exercise test protocol used to assess aerobic fitness in healthy populations to a participant • adjust the workloads on the bicycle to allow the subject to exercise at a power output designated by the examiner

	<ul style="list-style-type: none"> • set up an athlete for a VO₂ max assessment, using the metabolic cart • explain a VO₂ max test protocol to an athlete prior to testing and confirm understanding • monitor the subject throughout testing using pre-established cues • interpret and explain the results to the subject
<i>Anaerobic Capacity Assessment</i>	<ul style="list-style-type: none"> • correctly set up a client for a Wingate test • correctly set up the computer for the measurement of peak power or anaerobic capacity • explain the testing protocol to the client • ensure the client understands the test requirements, the safety issues and test termination • monitor and verbally encourage the subject throughout testing • guide the subject at test completion into a cool down
<i>ECG Assessment</i>	<ul style="list-style-type: none"> • correctly set up a 12 lead ECG using appropriate lead placement • describe a protocol used in a 12 lead ECG stress test • run an ECG assessment • interpret and explain the results to the subject

Deferred Exams

If you miss an exam for medical reasons you must supply adequate documentation (including a medical certificate). Your request for consideration will then be assessed and a deferred exam may be granted. You cannot assume you will be granted supplementary assessment. The deferred exam may include a significant oral element. ***It is intended that supplementary exams for School of Medical Sciences courses in Semester 2, 2015 will be advised on the SOMS website.***

Course schedule HESC 2501

Wk	Date	Lectures (1hr)			Labs (2hrs)	
		Lecture 1 MON 2-3pm LG03 WW	Lecture 2 MON 3-4pm LG03 WW	Lecture 3 THURS 11-12pm LG03 WW	Large Lab WED 1-3pm WED 3-5pm WW Rm 120	Small Lab WED 1-3pm WED 3-5pm FRI 9-11am WW Clin Ex Phys labs
1	27 Jul	1.1: Introduction to Exercise Physiology Review of the course and assessment JT / AK	1.2: Biochemistry review Metabolism & energy generation CM	1.3: Measurement of human energy expenditure CM	LAB 1: Anaerobic capacity testing (Wingate + Lab reports) (AK, JB, AS, BC)	
2	3 Aug	2.1: Anaerobic Exercise Assessment Anaerobic metabolism during exercise and assessment JT	2.2: Aerobic Exercise Assessment Aerobic metabolism during exercise; Assessment of aerobic capacity JT	2.3: Exercise Assessment III Assessment of aerobic capacity JT	LAB 2: Cardio-vascular response to exercise (HR, BP, RPE) (MM, JB, AS, BC)	
Assignment - Lab 1 Report (ungraded): Due Mon 10th Aug 9.00am (via TurnItIn on Moodle)						
3	10Aug	3.1: Cardiovascular response to exercise YB	3.2: Cardiovascular response to exercise II YB	3.3: Lactate and Exercise MM		LAB 3: VO₂max Wed 1-3: AK,AS Wed 3-5: AK,AS Fri 9-11: AK,AS
4	17Aug	4.1: Cardiovascular response to exercise III YB	4.2: Cardiovascular response to exercise IV (assessment) YB	4.3: ECG - Introduction AK		LAB 3: VO₂max Wed 1-3: AK,JB Wed 3-5: AK,JB Fri 9-11: AK,AS
5	24Aug	5.1: ECG and exercise AK	5.2: ECG anomalies AK	Mid-semester Exam (Room TBA) Supervisor: JT	LAB 4: ECG (AK, JB, AS, BC)	
6	31 Aug	6.1: Respiratory response to exercise JT	6.2: Specific nutritional requirements of athletes JT	6.3: Optimal nutrition for sports performance JT	LAB 5: Cardio-respiratory response to exercise (VT & LT) (AK, JB, AS, BC)	
7	7 Sept	7.1: Exercise Training: Adaptations AK	7.2: Exercise Training: Programming (Aerobic) AK	7.3: Review of Exam & Elective & Gen Ed Session JT		LAB 6: Combined skills Wed 1-3: AK,AS Wed 3-5: AK,AS Fri 9-11: AK,AS

8	14Sept	8.1: Exercise Training: Programming (Anaerobic / Concurrent) AK	8.2: Exercise Training: Ergogenic Aids AK	8.3: Exercise Training: Resistance JT		LAB 6: Combined skills Wed 1-3: AK,JB Wed 3-5: AK,JB Fri 9-11: AK,AS	
Assignment – Lab Report (graded): Due Fri 25th Sept 9.00am (via TurnItIn on Moodle)							
9	21Sept	9.1: Resistance Training and DOMS AK	9.2: Muscle Fatigue AK	9.3: Muscle adaptations to resistance training JT	LAB 7: Muscle response to exercise (JT, JB, AS, BC)		
Mid Semester Break							
10	5 Oct	LABOUR DAY		10.3: Exercise and Childhood MM		LAB 8: OSCE Skills Practice (WW120) Wed 1-3: AK,AS Wed 3-5: AK,AS Fri 9-11: AK,AS	
11	12 Oct	11.1: Exercise and Overtraining AK	11.2: Exercise and Gender JT	11.3: Exercise and Pregnancy MM		LAB 8: OSCE Skills Practice (WW120) Wed 1-3: AK,JB Wed 3-5: AK,JB Fri 9-11: AK,AS	
12	19 Oct	12.1: Exercise and the environment: thermal stress YB	12.2: Exercise and the environment: altitude SB	12.3: Review lecture JT		OSCE Exam Wed 1-3: Examiners Wed 3-5: Examiners Fri 9-11: Examiners	
13	26 Oct						OSCE Exam Wed 1-3: Examiners Wed 3-5: Examiners Fri 9-11: Examiners

Please note that there may be some slight alterations to this schedule.

Lecturers and Demonstrators: Dr Jeanette Thom (JT), Dr Andrew Keech (AK), Dr Chris Maloney (CM), Dr Yati Boutcher (YB), AProf Stephen Boutcher (SB), Dr Maria Matuszek (MM), Jessica Bellamy (JB), Andrew Saliba (AS), Briana Clifford (BC)

The mid-semester exam is held Thursday 27th August 11am. The venue is to be allocated. The exam consists of 50 min reading/writing time.