

**THE UNIVERSITY OF  
NEW SOUTH WALES AUSTRALIA**



**Exercise Physiology Program  
School of Medical Sciences  
UNSW Medicine**

**HESC2501**

**Exercise Physiology**

Semester 2, 2014  
Course Outline

## Table of Contents

Staff Contact Details	1
Course Details	2
Course Description	2
Aims, Learning Outcomes and Graduate Attributes	2
Rationale for the inclusion of content and teaching approach	2
How the course relates to the Exercise Physiology Profession	2
How the course relates to other courses in the Exercise Physiology Program	2
Teaching strategies	3
Assessment	3
Summary of assessments	3
Assessment Task 1 – <i>Mid Semester Exam</i>	3
Assessment Task 2 – <i>End of Session Exam</i>	4
Assessment Task 3 – <i>Laboratory Assignments</i>	4
Submission of assignments	5
Assessment Task 4 – OSCE	8
Academic honesty and plagiarism	9
Course schedule	10
Resources for students	12
Course evaluation and development	12
Occupational Health and Safety	13
Examination procedures and attendance requirements	13
Special consideration in the event of illness or misadventure	13

## Staff Contact Details

Position	Name	Email	Office
Co-Convenor	<b>Dr Jeanette Thom</b>	<a href="mailto:j.thom@unsw.edu.au">j.thom@unsw.edu.au</a>	WW 217
Co-Convenor	<b>Dr Andrew Keech</b>	<a href="mailto:andrew.keech@unsw.edu.au">andrew.keech@unsw.edu.au</a>	WW 202
Lecturer	<b>Dr Fiona Naumann</b>	<a href="mailto:f.naumann@unsw.edu.au">f.naumann@unsw.edu.au</a>	
Lecturer	<b>Dr Chris Maloney</b>	<a href="mailto:c.maloney@unsw.edu.au">c.maloney@unsw.edu.au</a>	
Lecturer	<b>Dr Ben Barry</b>	<a href="mailto:ben.barry@unsw.edu.au">ben.barry@unsw.edu.au</a>	
Lecturer	<b>AProf Stephen Boutcher</b>	<a href="mailto:s.boutcher@unsw.edu.au">s.boutcher@unsw.edu.au</a>	
Lecturer	<b>Dr Yati Boutcher</b>	<a href="mailto:y.boutcher@unsw.edu.au">y.boutcher@unsw.edu.au</a>	
Lecturer	<b>Dr Maria Matuszek</b>	<a href="mailto:m.matuszek@unsw.edu.au">m.matuszek@unsw.edu.au</a>	
Lecturer	<b>Dr David Simar</b>	<a href="mailto:d.simar@unsw.edu.au">d.simar@unsw.edu.au</a>	
Demonstrator	<b>Mr Matthew Jones</b>	<a href="mailto:matthew.jones@unsw.edu.au">matthew.jones@unsw.edu.au</a>	
Demonstrator	<b>Ms Jessica Bellamy</b>	<a href="mailto:j.bellamy@unsw.edu.au">j.bellamy@unsw.edu.au</a>	
Demonstrator	<b>Mr Nick Burrows</b>	<a href="mailto:n.burrows@unsw.edu.au">n.burrows@unsw.edu.au</a>	
Demonstrator	<b>Mr Andrew Saliba</b>	<a href="mailto:andrew.saliba@unsw.edu.au">andrew.saliba@unsw.edu.au</a>	

**Technical Officer:**           **Mr Balu Daniel**                           [d.balu@unsw.edu.au](mailto:d.balu@unsw.edu.au)  
School of Medical Sciences (Rm 118 WW)

**Program Officer:**           **Ms Sue Cheng**                           [sue.cheng@unsw.edu.au](mailto:sue.cheng@unsw.edu.au)  
School of Medical Sciences (MESO office, ground floor WW)

## 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: <http://moodle.telt.unsw.edu.au/>. Lectures 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 7 labs (each 2 hours) in this subject; including 4 large-group (~40 students) labs and 3 smaller-group (~8 students) labs.

**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 11 & 12

### Assessment Task 1 – MID SEMESTER EXAM

The MID SEMESTER EXAM is a written exam comprised of multiple choice and/or short answer questions, and analytical interpretation of typical experimental situations. It will cover lecture and laboratory material from weeks 1-5. 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/or 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. the student's 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.

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, 4 **OR** 5. 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**

As indicated above, two (2) lab reports must be written up and submitted (Wk 3 – ungraded (feedback only); Wk 9 – graded). To achieve the highest possible marks each student 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 can be written as a paragraph or use bullet 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, 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.
- Answers to any additional numerical calculations need to be completed and entered in the appropriate space provided in the table.
- Under each table or graph, a description or summary of the key findings from the results must be provided. 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:
  - 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 and grammatically correct.
- Finally, a concluding statements needs to summarize the major finding/s from the report.

#### *Referencing:*

- 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 throughout (please use spell check and grammar check)
- The lab report need to demonstrate a professional presentation, with attention paid to design and layout.

### **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.

**Table 1: Marking criteria for assignments submitted in HESC2501**

Assignment Marking Criteria	Developing (Not Yet Competent)	Basic Competence	Competent	Advanced Competence
<b>Introduction &amp; Aim</b> <ul style="list-style-type: none"> <li>• Introduction explains the key concepts being studied.</li> <li>• Review the literature – detail findings from previous research on the topic. Referenced research findings are directly relevant to topic, and are reasonably current.</li> <li>• Concise writing and relevant to topic.</li> <li>• Aim or purpose of the lab clearly stated.</li> </ul>	<ul style="list-style-type: none"> <li>* Unable to explain the key concepts relevant to the lab.</li> <li>* Did not review any literature</li> <li>* Unable to reference statements</li> <li>* Unable to state a clear aim.</li> </ul>	<ul style="list-style-type: none"> <li>* Some explanation of the key concepts relevant to the lab.</li> <li>* Provided a basic review of some relevant research.</li> <li>* Demonstrated ability to reference statements but was inconsistent.</li> <li>* An aim was stated but did not outline the major purpose of the lab.</li> </ul>	<ul style="list-style-type: none"> <li>* Explained key concepts relevant to the lab.</li> <li>* Provided a review of relevant research.</li> <li>* Most statements were referenced throughout.</li> <li>* An aim was stated that outlined the purpose of the lab.</li> </ul>	<ul style="list-style-type: none"> <li>* Clearly explained all key concepts relevant to the lab.</li> <li>* Provided a comprehensive review of relevant research.</li> <li>* All statements were consistently referenced throughout.</li> <li>* A clear aim was stated that detailed the purpose of the lab.</li> </ul>
<b>Methods</b> <ul style="list-style-type: none"> <li>• Procedures are explained in adequate detail to enable replication of the entire task by an independent researcher.</li> <li>• Procedures paraphrased in own words, not copied from the lab manual.</li> </ul>	<ul style="list-style-type: none"> <li>* Unable to write the procedures in detail that would enable replication.</li> <li>* Unable to write the procedures in one's own words, copying the procedures from the lab manual.</li> </ul>	<ul style="list-style-type: none"> <li>* Presented basic procedural steps but lacked the detail to enable task replication.</li> <li>* Demonstrated an ability to write the procedures mostly in one's own words</li> </ul>	<ul style="list-style-type: none"> <li>* Presented procedural steps that would enable task replication.</li> <li>* Demonstrated an ability to write the procedures in one's own words.</li> </ul>	<ul style="list-style-type: none"> <li>* Presented detailed procedural steps with detail that would enable task replication.</li> <li>* Demonstrated an ability to write all of the procedures in one's own words, demonstrating understanding.</li> </ul>
<b>Results</b> <ul style="list-style-type: none"> <li>• Participant details are outlined.</li> <li>• Key data are correct and appropriately presented in tables / figures.</li> <li>• Summarise what the key data is showing (i.e. describe the tables / figures).</li> <li>• Tables / figures are labelled.</li> </ul>	<ul style="list-style-type: none"> <li>* Unable to provide detail of the participants.</li> <li>* Incorrect data and/or unable to present data in tables / figures.</li> <li>* Unable to summarise the key data.</li> <li>* Unable to label the tables / figures</li> </ul>	<ul style="list-style-type: none"> <li>* Some demographic data for the participants provided.</li> <li>* Mostly correct data and/or presented in basic tables / figures.</li> <li>* Provided a brief or inconsistent summary of the key data.</li> <li>* Some labelling of the tables / figures.</li> </ul>	<ul style="list-style-type: none"> <li>* Demographic data for the participants provided.</li> <li>* Correct, key data presented in tables / figures.</li> <li>* Provided a summary of the key data.</li> <li>* Labelling of the tables / figures.</li> </ul>	<ul style="list-style-type: none"> <li>* Demographic data for the participants clearly and concisely provided.</li> <li>* Correct, key data presented in well-designed tables / figures.</li> <li>* Provided a detailed summary of the key data.</li> <li>* Clear and concise labelling of the tables / figures.</li> </ul>
<b>Discussion &amp; Conclusion</b> <ul style="list-style-type: none"> <li>• Identifies key finding(s) (expected and/or unexpected) from the data.</li> <li>• Explains and 'makes sense' of the findings for the reader.</li> <li>• Compares findings to previous research (from the Introduction).</li> <li>• Implication(s) of the findings (e.g. for science or clinical applications).</li> <li>• Final statement (Conclusion) summarizing the study and the major finding(s).</li> </ul>	<ul style="list-style-type: none"> <li>* Unable to identify a major finding (expected or unexpected) from the data.</li> <li>* Unable to explain &amp; make sense of the key findings</li> <li>* Unable to compare own findings to that in the literature.</li> <li>* Unable to articulate the implication of the findings.</li> <li>* Unable to provide a conclusion</li> </ul>	<ul style="list-style-type: none"> <li>* Identified some findings (expected or unexpected) from the data.</li> <li>* Able to somewhat explain and make some sense of the findings</li> <li>* Overly basic or incorrect comparison of own findings to that in the literature.</li> <li>* Somewhat able to articulate the implication of the findings</li> <li>* Provided a basic or unclear conclusion</li> </ul>	<ul style="list-style-type: none"> <li>* Identified key findings (expected or unexpected) from the data.</li> <li>* Explained and made sense of the key findings</li> <li>* Compared own findings to that in the literature.</li> <li>* Able to articulate the implication of the findings</li> <li>* Provided a clear conclusion.</li> </ul>	<ul style="list-style-type: none"> <li>* Clearly identified key findings (expected or unexpected) from the data.</li> <li>* Clearly explained the findings and provided in-depth interpretation to make sense of the key findings, being critical of own methodology.</li> <li>* Comprehensively compared own findings to that in the literature.</li> <li>* Able to articulate the implication of the findings.</li> <li>* Provide a clear &amp; concise conclusion.</li> </ul>

<p><b>Other (e.g. Referencing, Grammar &amp; Spelling, and overall Presentation).</b></p> <ul style="list-style-type: none"> <li>• Appropriate Reference section (APA format) and referencing of statements in the body of the report.</li> <li>• Correct grammar, spelling and punctuation, and use of past tense.</li> <li>• Report is professionally presented.</li> </ul>	<ul style="list-style-type: none"> <li>* No evidence of referencing, or an inadequate Reference section (e.g. not APA format) and/or incorrect referencing of statements in the body of the report.</li> <li>* Frequently incorrect grammar, spelling and punctuation, and/or incorrect tense.</li> <li>* Poorly-presented report.</li> </ul>	<ul style="list-style-type: none"> <li>* Basic Reference section (APA format) and/or referencing of statements in the body of the report.</li> <li>* Some incorrect grammar, spelling and punctuation, and/or inconsistent use of past tense.</li> <li>* Basic presentation of report.</li> </ul>	<ul style="list-style-type: none"> <li>* Mostly appropriate Reference section (APA format) and referencing of statements in the body of the report.</li> <li>* Mostly correct grammar, spelling and punctuation, and use of past tense.</li> <li>* Good presentation of report.</li> </ul>	<ul style="list-style-type: none"> <li>* Appropriate Reference section (APA format) and correct referencing of statements in the body of the report.</li> <li>* Correct grammar, spelling and punctuation, and use of past tense.</li> <li>* Professionally-presented report.</li> </ul>
---	---	---	--	--



## Assessment Task 4 – OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

The OSCE will be held in weeks 11 & 12 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"> <li>• perform a manual and electronic measurement of resting &amp; exercise heart rate.</li> <li>• perform a measurement of resting &amp; exercise systolic and diastolic blood pressure</li> <li>• interpret and explain the results to the subject</li> </ul>
<i>Blood Collection and Blood Lactate Assessment</i>	<ul style="list-style-type: none"> <li>• perform the collection of blood from a subject by finger-prick following an exercise bout and examine the sample for blood lactate</li> <li>• interpret and explain the results to the subject</li> <li>• perform all tasks following the rules governing safe handling of blood and sharps disposal</li> </ul>
<i>Respiratory Function Assessment</i>	<ul style="list-style-type: none"> <li>• perform a measurement of vital capacity and FEV<sub>1,0</sub></li> <li>• interpret and explain the results to the subject</li> </ul>
<i>Aerobic Capacity Assessment</i>	<ul style="list-style-type: none"> <li>• correctly set up a subject on a Monark bicycle ergometer in preparation for exercise</li> <li>• correctly attach and fit a heart rate monitor to the subject prior to commencing the test</li> <li>• explain a sub-maximal aerobic exercise test protocol used to assess aerobic fitness in healthy populations to a participant</li> <li>• adjust the workloads on the bicycle to allow the subject to exercise at a power output designated by the examiner</li> <li>• set up an athlete for a VO<sub>2</sub> max assessment, using the metabolic cart</li> <li>• explain a VO<sub>2</sub> max test protocol to an athlete prior to testing and confirm understanding</li> </ul>

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

### **Academic honesty and plagiarism**

Plagiarism is using the words or ideas of others and presenting them as your own. Plagiarism is a type of intellectual theft and is regarded by the university as academic misconduct. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. The University has adopted an educative approach to plagiarism and has developed a range of resources to support students. The Learning Centre can provide further information via <http://www.lc.unsw.edu/plagiarism>.

### **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>

## Course schedule HESC 2501

Wk	Date	Lectures (1 hr)			Labs (2hrs)	
		Lecture 1 MON 12-1pm LG03 WW	Lecture 2 MON 1-2pm LG03 WW	Lecture 3 THURS 10-11am Biomed C	Large Lab WED 1-3pm WED 3-5pm WW Rm 116	Small Lab WED 1-3pm WED 3-5pm FRI 9-11am WW Clin Ex Phys labs
1	28 Jul	<b>1.1: Introduction to Exercise Physiology</b> Review of the course and assessment JT / AK	<b>1.2: Biochemistry review</b> Metabolism & energy generation CM	<b>1.3: Measurement of human energy expenditure</b> CM	<b>LAB 1: Anaerobic capacity testing</b> (Wingate + Lab reports) (WW 116) (AK, MJ, JB, AS)	
2	4 Aug	<b>2.1: Exercise Biochemistry</b> Energy pathways; anaerobic metabolism during exercise FN	<b>2.2: Exercise Biochem II</b> Assessment of anaerobic capacity FN	<b>2.3: Exercise Biochem III</b> Aerobic metabolism during exercise FN	<b>LAB 2: Cardio-vascular response to exercise</b> (HR, BP, RPE) (WW 116) (MM, MJ, JB, AS)	
<b>Assignment - Lab 1 Report (ungraded): Due Mon 11<sup>th</sup> Aug 9.00am (via TurnItIn on Moodle)</b>						
3	11Aug	<b>3.1: Exercise Biochem IV</b> Assessment of aerobic capacity (VO <sub>2</sub> max, lactate & vent threshold) FN	<b>3.2: Specific nutritional requirements of athletes</b> JT	<b>3.3: Optimal nutrition for sports performance</b> JT		<b>LAB 3: VO<sub>2</sub>max</b> Wed 1-3: MJ, AK Wed 3-5: MJ, AK Fri 9-11: AK, NB
4	18Aug	<b>4.1: Respiratory response to exercise</b> JT	<b>4.2 Cardiovascular response to exercise</b> YB	<b>4.3: Cardiovascular response to exercise II</b> YB		<b>LAB 3: VO<sub>2</sub>max</b> Wed 1-3: MJ, JB Wed 3-5: MJ, JB
5	25Aug	<b>5.1: Cardiovascular response to exercise III</b> YB	<b>5.2 Cardiovascular response during exercise - assessment</b> YB	<b>Mid-semester Exam</b> (Room TBA) Supervisor: JT	<b>LAB 4: Cardio-respiratory response to exercise</b> (VT & LT) (WW 116) (AK, MJ, JB, AS)	
6	1 Sept	<b>6.1: ECG</b> Basics & principles SB	<b>6.2: ECG and exercise</b> Lead placement, response to exercise SB	<b>6.3: ECG anomalies</b> Identifying cardiac abnormalities SB		<b>LAB 5: Combined skills</b> Wed 1-3: MJ, AK Wed 3-5: MJ, AK Fri 9-11: AK, NB
7	8 Sept	<b>7.1: Exercise Prescription &amp;</b>	<b>7.2: Exercise Prescription &amp;</b>	<b>7.3: Review of Exam</b> <b>Elective &amp; Gen Ed</b>		<b>LAB 5: Combined skills</b> Wed 1-3: MJ, JB

		<b>Programming</b>	<b>Programming II</b>	<b>Session</b>		Wed 3-5: MJ, JB
8	15Sept	<b>AK</b> <b>8.1: Exercise Training: Anaerobic system</b> <b>AK</b>	<b>AK</b> <b>8.2: Exercise Training: Aerobic system</b> <b>AK</b>	<b>FN / JT</b> <b>8.3: Exercise Training: Resistance</b> <b>JT</b>	<b>LAB 6: ECG</b> (WW 116) <b>(AK, MJ, JB, AS)</b>	
<b>Assignment – Lab Report (graded): Due Mon 22<sup>nd</sup> Sept 9.00am (via TurnItIn on Moodle)</b>						
9	22Sept	<b>9.1 Resistance Training and DOMS</b> <b>BB</b>	<b>9.2: Muscle Fatigue</b> <b>BB</b>	<b>9.3: Muscle adaptations to resistance training</b> Muscle fiber typing <b>JT</b>		<b>LAB 7: OSCE Skills Practice</b> Wed 1-3 (LG02): AK, MJ, JB Wed 3-5: AK, MJ, JB Fri 9-11: AK, NB, JB
<b>Mid Semester Break</b>						
10	6 Oct	LABOUR DAY	LABOUR DAY	<b>10.3: Exercise and Childhood</b> <b>MM</b>		<b>LAB 7: OSCE Skills Practice</b> Wed 1-3: AK, MJ, JB Wed 3-5: AK, MJ, JB
11	13 Oct	<b>11.1: Overtraining</b> immune system suppression <b>DS</b>	<b>11.2: Exercise and Gender</b> <b>JT</b>	<b>11.3: Exercise and Pregnancy</b> <b>MM</b>		<b>OSCE Exam</b> Wed 1-3: Wed 3-5: Fri 9-11:
12	20 Oct	<b>12.1: Exercise and the environment: thermal stress</b> <b>YB</b>	<b>12.2: Exercise and the environment: altitude</b> <b>SB</b>	<b>12.3: Review lecture</b> <b>JT</b>		<b>OSCE Exam</b> Wed 1-3: Wed 3-5:

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

**Lecturers and Demonstrators:** Dr Jeanette Thom (JT), Dr Andrew Keech (AK), Dr Fiona Naumann (FN), Dr Ben Barry (BB), Dr Chris Maloney (CM), Dr Yati Boutcher (YB), AProf Stephen Boutcher (SB), Dr Maria Matuszek (MM), Dr David Simar (DS), Matthew Jones (MJ), Jessica Bellamy (JB), Nick Burrows (NB), Andrew Saliba (AS).

**The mid-semester exam is held Thursday 28<sup>th</sup> August 10am. The venue is to be allocated. The exam consists of 50 min reading/writing time.**

## Resources for students

### Moodle

Information about the course and a number of electronic study resources can be accessed via the UNSW Moodle system. Moodle is an internet-based set of Course Tools designed to enable online learning. Go to: <http://moodle.telt.unsw.edu.au>. You can use Moodle to download lecture notes, access your grades, find reference material in the course (such as this Course Outline), and communicate with the course convenors, the lecturers and demonstrators, and your peers. Lecture notes will be made available prior to each lecture. Lab notes will be available from the start of semester, and data from each lab will be submitted immediately after the lab. Assignments must be submitted electronically via TurnItIn on Moodle.

### UNSW Library

The University Library provides a range of services to assist students in understanding how to identify what information is required for assignments and projects; how to find the right information to support academic activities; and how to use the right information most effectively. Go to: <http://www.library.unsw.edu.au>

### Reserve (MyCourse)

Many items (books and journal articles) set as recommended reading for courses will be located in Reserve, which is on Level 2 of the Main Library. Some of the journal articles will be available in electronic format via MyCourse. To search for these items, go to the library website catalogue and search for the course code.

### Textbook

**McArdle WD, Katch FI, Katch VL (2014)** Exercise physiology. Energy, nutrition and human performance. (8th edition) Lippincott, Williams and Wilkins. Philadelphia, USA. (The 7<sup>th</sup> 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

### Other Suggested Reference Books

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

### Course evaluation and development

Each year feedback is sought from students about the courses offered in Exercise Physiology and continual improvements are made based on this feedback. The Course and Teaching Evaluation and Improvement (CATEI) Process of UNSW is the method used for the collection of feedback. At the end of the semester

students will be asked by UNSW to provide feedback on HESC2501. Significant changes are then communicated to the following cohort of students.

### **Health and Safety**

Class activities must comply with the NSW Occupational Health & Safety Act 2000 and the Occupational Health & Safety (OHS) Regulations 2001. It is expected that students will conduct themselves in an appropriate and responsible manner in order not to breach OHS regulations. Further information on relevant OHS policies and expectations is outlined at: [http://www.hr.unsw.edu.au/ohswc/ohs/ohs\\_policies.html](http://www.hr.unsw.edu.au/ohswc/ohs/ohs_policies.html)  
All students must come prepared for active participation in laboratories. No open footwear is permitted. No consumption of food is permitted in class.

### **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.

### **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, 2014 will be advised on the SOMS website.*

### **Special consideration in the event of illness or misadventure**

#### **Please note the following Statement regarding Special Consideration.**

If you believe that your performance in a course, either during session or in an examination, has been adversely affected by sickness, misadventure, or other circumstances beyond your control, you should notify the Registrar and ask for special consideration in the determination of your results. Such requests should be made as soon as practicable after the problem occurs. **Applications made more than three working days after the relevant assessment will not be accepted except in TRULY exceptional circumstances.**

When submitting a request for special consideration you should provide all possible supporting evidence (eg medical certificates) together with your student number and enrolment details. Consideration request forms are available from Student Central in the Chancellery or can be downloaded from the web page linked below.

Note that normally, if you miss an exam (without medical reasons) you will be given an absent fail. If you arrive late for an exam no time extension will be granted. It is your responsibility to check timetables and ensure that you arrive on time.

Students who apply for consideration to Student Central must also contact the Course Convenor immediately.

All applications for Special Consideration will be processed in accordance with UNSW policy (see: <http://my.unsw.edu.au/student/atoz/SpecialConsideration.html>). If you miss an assessment and have applied for Special Consideration, this will be taken into account when your final grade is determined. You should note that marks derived from completed assessment tasks may be used as the primary basis for determining an overall mark. Where appropriate, supplementary examination may be offered, but only when warranted by the circumstances.

### **Student equity and diversity issues**

Students requiring assistance are encouraged to discuss their needs with the course convenor prior to, or at the commencement of the course, or with the Student Equity and Diversity Unit (SEADU) (9385 4734). Further information for students with disabilities is available at <http://www.studentequity.unsw.edu.au>