Course Staff.................................................................................................................. 3
Course details.................................................................................................................. 3
Aims of the Course ......................................................................................................... 4
   Student Learning Outcomes.......................................................................................... 4
   Graduate Attributes...................................................................................................... 4
   Teaching strategies........................................................................................................ 4
Rationale for the inclusion of content and teaching approach ..................................... 5
Course evaluation and development ............................................................................ 5
Resources ....................................................................................................................... 6
   Textbooks.................................................................................................................... 6
   Suggested Reference Books......................................................................................... 6
   Weekly readings (textbook-article)................................................................................ 6
Assessment and submission of tasks ............................................................................. 9
   Penalties for late submission of assignment ............................................................ 9
   Deferred Exams........................................................................................................... 10
   Group Research Question Assignment .................................................................... 11
Course schedule ............................................................................................................ 12

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 )
Course Staff

Course Convener

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Teaching Staff

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Course details

Credit Points: 6 UOC

Course Prerequisites / Assumed Knowledge: HESC2501

Course Description
This course gives an overview of advanced exercise physiology. It is a more advanced version of HESC2501 Exercise Physiology. Concepts in advanced exercise physiology such as bodily response to exercise as well as exercise adaptations will be covered. Literature related to acute and chronic response/adaptations to exercise as well as the mechanisms underlying the adaptations will also be discussed. In this course, students will have hands-on experience in carrying out a range of laboratory-based experiments.
Aims of the Course

The course aims to provide student with:
1. An overview of advanced exercise physiology
2. An understanding of how the human body works during exercise
3. An understanding of how the human body adapts to regular exercise
4. A variety of hands-on experience in carrying out laboratory-based experiments

Student Learning Outcomes

At the end of the course you should be able to:
- Understand advanced integrated exercise physiology
- Understand the major physiological adaptations to exercise
- Acquire conceptual understanding from laboratory experiences

Graduate Attributes

- Understand the concepts and mechanisms underlying exercise-induced cardiovascular health
- Competent in delivering/advising exercise dose-response relationship to clients with regard to preventative lifestyle strategies
- Competent in designing exercise training programs for aerobic and resistance based athletes
- Engage in independent and continual reflective learning and in line with current scientific knowledge as well as following an evidence-based approach

Teaching strategies

Lectures – Lectures are on Tuesdays, 3-5 pm (Wallace Wurth LG02) and Wednesdays, 12-1 pm (Wallace Wurth LG02). Although the lectures notes are provided (see below) it is important that you attend each lecture as it is not possible to include all information delivered in class into the PDF lecture notes. The content of lectures will be taken from core and suggested textbooks and readings (articles). Thus, it is essential that you do the readings prior to attending the lectures. Also, punctual arrival is expected for every lecture. Lecture notes are available in PDF format on Moodle. Lectures are recorded (LGO2) and available from ExhoCenter with Moodle. See also: https://student.unsw.edu.au/lecture-recordings-view-and-download

Laboratories – Laboratories are on Fridays, 10 am-1 pm and 2-5 pm (Wallace Wurth 116; weeks 3, 5, 7, 9, 11). Punctual arrival is expected in every lab as important information including the procedure of each lab is discussed prior to the lab activity. Late entry will be refused and marked as absent; allow at least 10 min arrival before each lab as you may need to change your attire for lab activity and re-read the procedure for the lab activity. The lab manual can be downloaded and printed from Moodle. During the labs all of you are expected to be involved actively as a tester or/and a subject. Eating is not permitted except bottles of water. You are expected to wear appropriate attire for lab activities (shorts, shirt, and trainers). Open shoes, sandals, tongs are not permitted and you will be refused entry and participation in the lab activities. In the case that you cannot participate in the lab as a subject/tester you are required to produce a medical certificate.
Punctuality and unit attendance

- Class and laboratory role will be taken in every lecture and laboratory. Students are expected to attend the class on time.
- The attendance is compulsory for both lecture and the labs. **Minimum of 80% of lecture attendance and 100% of lab attendance are required to pass the course.** Failure to attend one of the labs will result in failure of the course. Students who cannot meet the attendance criteria above will not be allowed to attend the exam. Students who cannot attend lecture or labs for medical reasons need to produce a medical certificate.

On the SoMS website Student Advice page, see also:

- Attendance
- Special Consideration

Independent study – It is essential that you set aside the time for independent study. You are expected to read the core and supplement text book as well as articles provided to give you background information about the upcoming lectures/labs. You are reminded that UNSW recommends that a 6 units-of-credit course should involve about 150-180 hours of study and learning activities.

Rationale for the inclusion of content and teaching approach

**How the course relates to the Exercise Physiology profession** – The content of Advanced Exercise Physiology allows students to learn and explore integrated exercise physiology. Students will have a greater understanding of concepts, underlying mechanisms, and relationships between exercise and physiological changes. Thus, a stronger background in integrated exercise physiology will make students more confident and competent in delivering exercise prescription as an exercise physiologist.

**How the course relates to other courses in the Exercise Physiology program** – The course is a continuation of HESC2501 Exercise Physiology. The content of Advanced Exercise Physiology (both lecture material and labs) is also related to HESC3504 Physical Activity and Health and HESC3541 Clinical Exercise Physiology. Advanced Exercise Physiology also gives a foundation for those students who are also interested in enhancing the performance of athletes.

Course evaluation and development

The course is always evaluated each year through the Course and Teaching Evaluation and Improvement (CATEI). At the end of the course students are encouraged to give feedback on both lecturers and content of the course. Based on students’ feedback then necessary changes or improvement are made. The development of the course content includes some revisions on the content needed and/or current readings.
Resources

See also Learning Resources

Textbooks


Suggested Reference Books

- Tipton CM (editor) (2006). ACSMS’s Advanced Exercise Physiology. Lippincot Williams & Wilkins.

Weekly readings (textbook-article)

Week 1
Lect 1: Introduction
Lect 2:
(2) Stovitz SD, Batt ME. The epidemic has gone global: can Exercise is Medicine help quell the tide? Br J Sports Med 2010;44:693.

Week 2
Lect 5:

Week 3
Week 4
Lect 12:

Week 5
Lect 13:

Week 6

Week 7

Week 8

Week 9

Lect 26:
Week 10

Lect 28:


Week 11

Lect 31:


Lect 32:


Lect 33:


Week 12

Lect 34:


Lect 35:

Assessment and submission of tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab report</td>
<td>25%</td>
</tr>
<tr>
<td>Group research question report</td>
<td>10%</td>
</tr>
<tr>
<td>Individual oral presentation</td>
<td>5%</td>
</tr>
<tr>
<td>Mid-term exam</td>
<td>20%</td>
</tr>
<tr>
<td>Final exam</td>
<td>40%</td>
</tr>
</tbody>
</table>

- Lab report - Students are expected to write a lab report, which is mainly answering questions and creating graphs and tables from the data obtained. **Do not submit the lab report through email. Lab report should be submitted before the next lab is started (there is no extension).** The lab report has to be submitted through Moodle Turnitin. Lab reports received after the due date will not be allocated a mark. It is recommended that you have a discussion group between/among you for brainstorming related to the lab questions. **However, under no circumstances must you produce similar/identical reports. If two or more reports are found to be similar both/all reports will be marked zero.**

- Group research question report – In a group of 3, students are expected to write not less than 15 pages (doubled spaced) not including tables, graphs, and references list on a research question in Exercise Physiology or related area. Students will choose the research question from a list provided. **Do not submit similar topics that have been previously submitted in another course.** The submission date is 13th May 2016 (week 10).

- Individual oral presentation – Students are expected to present their chosen research question above prior to the submission of their report. Twenty minutes for the presentation and 10 minutes for questions will be allocated for each group (3 students).

- Mid-term exam - The mid-term exam will consist of multiple choice questions. The questions will cover lecture material from week 1 to week 5

- Final exam - The final exam will consist of multiple choice and short answer questions. The multiple choice and short answer questions will be based on the material covered in the lectures, labs, and readings (articles and textbooks).

Penalties for late submission of assignment

In cases where an extension has NOT been granted, the following penalties will apply:

- The lab report has to be handed in before the next lab is started (there is no extension). Lab reports received after the due date will not be allocated a mark.
- The last lab report has to be submitted in week 13: 3rd June 2016 by 4pm.
- Lab reports received after the due date will not be allocated a mark.
- Assignment (research question) submitted after 4.00 pm on the due date will incur a penalty of 50% of the maximum mark available for that assignment. A further 25% of the maximum possible allocated marks (i.e., a total of 75%) will be deducted from assignments which are two days late. Assignments received two or more days after the due date will not be allocated a mark, however, the assignment must still be submitted to pass the unit.
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 1, 2016 will be held in the week commencing Monday 4th July, 2016.*

See [Special Consideration](#)

Marking criteria
Laboratory report – Each laboratory report is worth 5% (total of 25% for five lab reports). The content of the laboratory report should mainly answer questions related to the data that are collected during the lab activity. You are expected to answer the questions and present the findings from your lab activity concisely and clearly. You need to include graphs/figures and may also include calculations (if required) as well as some simple statistical analyses.

It is recommended that you use APA style (citation) when you prepare your lab report (see APA style: [https://student.unsw.edu.au/american-psychological-association-apa-referencing-system](https://student.unsw.edu.au/american-psychological-association-apa-referencing-system))
# Group Research Question Assignment

<table>
<thead>
<tr>
<th>Criteria</th>
<th>High Distinction</th>
<th>Distinction</th>
<th>Credit</th>
<th>Pass</th>
<th>Pass Conceded</th>
<th>Fail</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Clearly written, concise, comprehensive overview of the paper's scope</td>
<td>Clearly written, concise, good overview of the paper's scope</td>
<td>Acceptable written expression, good overview of the paper's scope</td>
<td>Some errors in written expression, adequate overview of the paper's scope</td>
<td>Poorly written, cursory overview of the paper's scope</td>
<td>Poorly written, no overview of the paper's scope</td>
<td>10</td>
</tr>
<tr>
<td>Synthesis of the Literature</td>
<td>Clearly written, concise, comprehensive and critical analysis of relevant studies</td>
<td>Clearly written, concise, critical analysis of many relevant studies</td>
<td>Acceptable written expression, critical analysis of some relevant studies</td>
<td>Some errors in written expression, Adequate analysis of some relevant studies</td>
<td>Poorly written, Some reference to relevant studies</td>
<td>Poorly written, No reference to relevant studies</td>
<td>30</td>
</tr>
<tr>
<td>Arguments in response to the question</td>
<td>Clearly written, concise, original ideas well supported by evidence</td>
<td>Clearly written, concise, Some original ideas with supporting evidence</td>
<td>Acceptable written expression, Some original ideas and clear interpretation of sourced arguments</td>
<td>Some errors in written expression, Acceptable presentation of sourced arguments</td>
<td>Poorly written, weak presentation of sourced arguments</td>
<td>Poorly written, Unconvincing arguments</td>
<td>30</td>
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<tr>
<td>Use of figures and tables</td>
<td>Good use of tables and figures with excellent presentation</td>
<td>Good use of tables and figures and well presented</td>
<td>Some tables and figures and well presented</td>
<td>Some tables and figures but poorly presented</td>
<td>Either a table or figure but poorly presented</td>
<td>No tables, no figures</td>
<td>10</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Clearly written, concise, Insightful synthesis of main points in the paper</td>
<td>Clearly written, concise, adequate synthesis of main points in the paper</td>
<td>Acceptable written expression, adequate synthesis of main points in the paper</td>
<td>Some errors in written expression, acceptable presentation of main points in the paper</td>
<td>Poorly written, weak presentation of main points in the paper</td>
<td>Poorly written, no synthesis of main points in the paper</td>
<td>10</td>
</tr>
<tr>
<td>Presentation</td>
<td>Neat, legible, correct referencing, correct length</td>
<td>Neat, legible, few errors in referencing, correct length</td>
<td>Neat, legible, some errors in referencing, correct length</td>
<td>Legible, some errors in referencing</td>
<td>Untidy, many errors in referencing, inappropriate length</td>
<td>Illegible, no referencing, inappropriate length</td>
<td>10</td>
</tr>
</tbody>
</table>
## Course schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture 1</th>
<th>Lecture 2</th>
<th>Lecture 3</th>
<th>Labs</th>
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<tr>
<td></td>
<td></td>
<td>Wallace Wurth LG02</td>
<td>Wallace Wurth LG02</td>
<td>Wallace Wurth LG02</td>
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<tr>
<td></td>
<td></td>
<td>Tuesday 3-4 pm</td>
<td>Tuesday 4-5 pm</td>
<td>Wednesday 12-1 pm</td>
<td>Friday 10am-1pm; 2-5 pm</td>
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<tr>
<td>1</td>
<td>1/3/16</td>
<td>Introduction (YB)</td>
<td>Exercise is Medicine (YB)</td>
<td>The limits of human</td>
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<td></td>
<td>performance (YB)</td>
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</tr>
<tr>
<td>2</td>
<td>8/3/16</td>
<td>Metabolic adaptations to</td>
<td>Cardiovascular control</td>
<td>Cardiac adaptations to</td>
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<tr>
<td></td>
<td></td>
<td>exercise (SB)</td>
<td>and exercise (SB)</td>
<td>exercise (YB)</td>
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<tr>
<td>3</td>
<td>15/3/16</td>
<td>Muscle adaptations to</td>
<td>Resting metabolic rate</td>
<td>Laboratory write-up and</td>
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<td></td>
<td></td>
<td>exercise (SB)</td>
<td>and energy balance (SB)</td>
<td>Research question (YB)</td>
<td>18/3/16 - Lab 1: Resting</td>
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<td></td>
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<td>metabolic rate (RMR) and</td>
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<td></td>
<td></td>
<td>energy balance</td>
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<tr>
<td>4</td>
<td>22/3/16</td>
<td>Fat loss and exercise</td>
<td>Vascular adaptations to</td>
<td>Arterial stiffness and</td>
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<td></td>
<td></td>
<td>(SB)</td>
<td>exercise (YB)</td>
<td>exercise (YB)</td>
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**28/3/2016-3/4/2016 Mid-session recess**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture 1</th>
<th>Lecture 2</th>
<th>Lecture 3</th>
<th>Labs</th>
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<tbody>
<tr>
<td>5</td>
<td>5/4/16</td>
<td>Acute dynamic and static</td>
<td>Review for mid-term (YB)</td>
<td>Mid-term exam (YB)</td>
<td>8/4/16 - Lab 2: Blood</td>
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<td></td>
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<td>exercise (YB)</td>
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<td>pressure and exercise</td>
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<td><strong>Lab 1 report due: 8/4/16</strong></td>
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<tr>
<td>6</td>
<td>12/4/16</td>
<td>Heart rate variability</td>
<td>Exercise in the heat (YB)</td>
<td>Research question seminar</td>
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<td></td>
<td></td>
<td>and exercise (YB)</td>
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<td>(YB-SB)-compulsory</td>
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<td>attendance</td>
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<tr>
<td>7</td>
<td>19/4/16</td>
<td>Exercise in the cold</td>
<td>Blood volume and exercise</td>
<td>Research question seminar</td>
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<td>(YB)</td>
<td>(YB-SB)-compulsory</td>
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<td>attendance</td>
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<tr>
<td>8</td>
<td>26/4/16</td>
<td>Training and performance</td>
<td>Training issues (YB)</td>
<td>Research question seminar</td>
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<td></td>
<td>(SB)</td>
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<td>(YB-SB)-compulsory</td>
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<td></td>
<td>attendance</td>
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<td>9</td>
<td>3/5/16</td>
<td>Hemodynamic and body fluid</td>
<td>Exercise and economy (YB)</td>
<td>Research question seminar</td>
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<td>adaptation to exercise</td>
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<tr>
<td></td>
<td></td>
<td>(YB)</td>
<td></td>
<td>attendance</td>
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<tr>
<td>10</td>
<td>10/5/16</td>
<td>Fat and exercise</td>
<td>Exercise, vascular</td>
<td>Hyperbaric condition and</td>
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<td></td>
<td>performance (SB)</td>
<td>function, and cognition</td>
<td>exercise (YB)</td>
<td>Research question report</td>
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<tr>
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<td></td>
<td>(YB)</td>
<td></td>
<td>due: 13/5/16</td>
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<tr>
<td>11</td>
<td>17/5/16</td>
<td>Carbohydrate and exercise</td>
<td>Ergogenic aids (YB)</td>
<td>Wingate test (YB)</td>
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<td></td>
<td>performance (SB)</td>
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<td>20/5/16: Wingate test</td>
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<td><strong>Lab 4 report due: 20/5/16</strong></td>
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<tr>
<td>12</td>
<td>24/5/16</td>
<td>Microgravity and bed rest</td>
<td>Exercise and genetics (YB)</td>
<td>Review (YB)-compulsory</td>
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<td>conditions (YB)</td>
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<tr>
<td>13</td>
<td>31/5/16</td>
<td>NO Lecture</td>
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<td>Lab 5 report due: 3/6/16</td>
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</table>

Note: YB: Yati Boutcher; SB: Steve Boutcher