## Work Physiology 331

**Semester One, 2011**

<table>
<thead>
<tr>
<th><strong>Unit study package number:</strong></th>
<th>301301 (v.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode of study</strong></td>
<td>Internal</td>
</tr>
<tr>
<td><strong>Tuition pattern summary:</strong></td>
<td>5 contact hours per week comprising</td>
</tr>
<tr>
<td><strong>Credit value</strong></td>
<td>25</td>
</tr>
<tr>
<td><strong>Pre-requisite Units</strong></td>
<td>8472 Physiology 231 or any previous version AND 8846 Physiology 232 or any previous version</td>
</tr>
<tr>
<td><strong>Anti-requisite Units</strong></td>
<td>Nil</td>
</tr>
<tr>
<td><strong>Core Unit Status:</strong></td>
<td>SIGNIFICANT: Fail this unit TWICE and it may lead to the termination of your course.</td>
</tr>
<tr>
<td><strong>Result type:</strong></td>
<td>Grade and Mark</td>
</tr>
</tbody>
</table>

**Unit Co-ordinator:**
- **Name:** Dr Michaele GARDINER
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- **Building : Room** 404.210

**Administrative contact:**
- **Name:** Mrs Janette McLeod
- **Phone:** (08) 9266 7374
- **Email:** j.mcleod@curtin.edu.au
- **Building : Room** Biomedical Sciences Building 308.122

**Learning Management System:**
- **FLECS - Blackboard** ([oasis.curtin.edu.au](http://oasis.curtin.edu.au))
Syllabus
Human movement, optimal use of muscle strength; body dimensions and composition; work efficiency; types of work: positive, negative, dynamic, static; bioenergetics: aerobic, anaerobic metabolism; cardiovascular, pulmonary, neuroendocrine adaptations to exercise; fatigue; fluid, electrolyte and heat balance; evaluation of physical performance, fitness; factors affecting performance; exercise, health and disease.

Introduction
Work Physiology is an applied physiology unit which builds on concepts developed in foundation physiology and biochemistry studies as they apply to exercise science. The unit looks at physical activity within a scientific framework by reference to relevant published studies. An important aspect of the unit is the generation of real time laboratory data which is collected, formatted and analyzed for significance, trends and comparison with published data.

Unit Learning Outcomes

Upon successful completion of this unit you will be able to:

1. discuss the major anatomical and physiological determinants of human movement and performance
2. work collaboratively to investigate and evaluate factors contributing to human physical performance in the practical setting
3. access and critically analyse published data pertaining to physical activity
4. identify strategies for optimising physical activity within the context of improving the well-being of the individual

Curtin's Graduate Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply discipline knowledge</td>
<td>Thinking skills (use analytical skills to solve problems)</td>
</tr>
<tr>
<td>Communication skills</td>
<td>Technology skills</td>
</tr>
<tr>
<td>International perspective (value the perspectives of others)</td>
<td>Cultural understanding (value the perspectives of others)</td>
</tr>
<tr>
<td>Information skills (confidence to investigate new ideas)</td>
<td>Learning how to learn (apply principles learnt to new situations) (confidence to tackle unfamiliar problems)</td>
</tr>
<tr>
<td>Professional Skills (work independently and as a team) (plan own work)</td>
<td></td>
</tr>
</tbody>
</table>

Find out more about Curtin's Graduate attributes at the Office of Teaching & Learning website: otl.curtin.edu.au
Learning Activities

Lecture /Tutorials: These sessions will provide the theoretical background of topics in exercise physiology and include problem solving exercises and evaluation of relevant research papers.

Practical sessions: Activities examining aspects of exercise physiology. Participation is essential to provide group data for statistical analysis. Concepts covered in these sessions are integrated with the theoretical framework.

Learning Resources

Essential Texts
You should access the following texts in order to complete this unit:


Portsmouth L, Bathgate K & Gazey C Guide to Assignment Presentation 2010. School of Public Health. Curtin University of Technology - downloadable from the School of Public Health website

Recommended Texts
You do not have to purchase the following textbooks but you may like to refer to them.


Online Resources

1. **FLECS-Blackboard** – This will provide an electronic copy of the unit outline, due dates and other resources and relevant information. This material will only be accessible to students enrolled in the unit. ([http://lms.curtin.edu.au](http://lms.curtin.edu.au))

### Assessment Schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Value (%)</th>
<th>Unit Learning Outcome(s) assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz (Week 8)</td>
<td>10%</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Laboratory Reports (best 3 of 4)</td>
<td>35%</td>
<td>1, 2</td>
</tr>
<tr>
<td>Research paper &amp; Oral Presentation</td>
<td>15%</td>
<td>1, 3, 4</td>
</tr>
<tr>
<td>Final Examination</td>
<td>40%</td>
<td>1, 3, 4</td>
</tr>
</tbody>
</table>

### Pass Requirements

To pass this unit you must complete all components of the assessment matrix and achieve a combined total mark of at least 50%

### Detailed information on assessment tasks

#### Laboratories

Attendance at all laboratory sessions is compulsory. Students will act as their own subjects and are required to work collaboratively in order to achieve the outcomes of the unit. It is important to wear cool clothing to all the laboratory sessions (i.e. shorts, skirts but not jeans as they reduce heat loss). Closed footwear is required.

#### Laboratory Reports

- Students must submit a minimum of FOUR laboratory reports for assessment. The best THREE will be used for calculation of the practical assessment mark. Students may only present for assessment those laboratories they have attended.

- The write-up of two specific laboratory sessions is compulsory. These are the first laboratory session for which the due date for the presentation of the report is the Thursday of the week following the practical (10/3/11). The second compulsory write-up is the walking/running practical held over teaching weeks 6 & 7 (Due date 5/5/11).

Except for these two practicals, the due date for all other practical write-ups is the Thursday, two weeks after the completion of the respective laboratory session.
Practical write-ups must be presented in the following format:

1. **Cover page**

2. **Introduction** - review & describe in your own words the background and lead up to the research questions being investigated and the rationale for performing the experiments. You should refer to previously published studies here. **DO NOT DESCRIBE HERE WHAT YOU DID. JUST GIVE THE BACKGROUND AS TO WHY YOU ARE DOING THE EXERCISE.**

3. **Research Questions** - present the research questions to be answered. This is to keep you on track.

4. **Methods** - the purpose of this section is to describe the protocol used in sufficient detail such that the reader could repeat the experiment by following the directions given. **As you have already undertaken the experiment write in the past tense.** This section should give
   i) a description of how the experiments were actually performed including the equipment used and the rationale for the procedures used.
   ii) an example of calculations undertaken

5. **Results** - in this section you must not only present your results in a tabulated and/or graphic form but you must **describe to the reader what the results were. However, results should not be discussed** as this takes place in the Discussion section. Data must be presented in both raw and summary form and graphically presented where possible. Figures and Tables must be given a short descriptive title and numbered sequentially with all units of measure included on axes or in column headings. Raw data can be presented as an Appendix.

6. **Discussion** - this is where you discuss the results you obtained - what they mean and how they relate to any previously reported or published data and the research questions asked. Relevant journal articles may be provided in the resource box in the laboratory but you will need to access others from the library catalogue. It is expected that at least TWO previously published journal articles be referred to in your discussion for comparison with your results. You should also discuss the confidence you have in your results, possible sources of error and suggestions for improvement in experimental design or procedure.

7. **Summary** - write this like an abstract - i.e. concisely **summarize** what you did and what you found. Conclude by answering the research questions asked at the outset of the experiment.
8. **References** - list references used in the write-up using the *Chicago system* of referencing and citation as described in *Portsmouth L & Gazey C Guide to Assignment Presentation 2009*. Be consistent in your referencing style.

9. **Appendix** - for raw results

**Quiz** 10%
This will be held on Wednesday of teaching week 8 of the semester and will be based on lecture topics up to and including teaching week 7 and also content associated with the first five practical sessions.

**Seminar and Research Paper** 15%
An important part of the scientific process is the ability to research information and to communicate that information clearly and reliably in an oral and a written form.

To aid in the development of these skills students will each prepare and present a paper on an aspect of a seminar topic pertaining to physical activity. This will necessitate use of the library search facilities to find the information required, the production of a written report and an oral presentation. A list of topics will be provided but students may submit their own subject to approval by the unit coordinator. Students will work together to organise the seminar program. **Assessment will be based on the written paper and the oral presentation.**

Information is to be researched from recently published peer-reviewed research papers on individual studies in scientific journals. Search for these through the library electronic databases. You will need to obtain hard copies of the relevant papers by accessing the journals in libraries if they are not available electronically. It is expected for an assignment of this size that a **minimum of a dozen such papers will need to be sourced**. **Non-refereed sources (written, electronic, websites) are not to be used.** Textbooks and review articles may only be used in the introduction to the topic.

The research paper is to be submitted in both **electronic and hard copy formats**. Submission deadline: May 27 2011

**Research Paper Format**
This is to be 2500 - 3000 words in length and must be written in a format appropriate for a scientific review. It therefore must contain the following:

1. A **cover page** with the unit name, topic title, your name and student number and signed by you to state it is your own work.

2. **Table of Contents**
3. **Introduction** to the topic

4. The main body of the work with headings where you discuss the results of your research into the topic. All discussion must be fully referenced (see below) giving the source of your information.

   Use headings and illustrations such as diagrams, tables etc where possible to lighten the text. All such diagrams must be numbered, titled, referenced and, of course, be referred to in the text to justify their inclusion.

5. **Conclusion**

6. **References.** For this unit the CHICAGO SYSTEM OF REFERENCING AND CITATION as described in Portsmouth L, Bathgate K & Gazey C Guide to Assignment Presentation 2010.

7. A complete folio of the full text of the articles used in the research paper must be submitted with your paper. The folio can be submitted electronically.

   You could also refer to Lindsay, D. (1995) *A Guide to Scientific Writing* 2nd ed. for additional useful information on writing scientific reports.

The Seminar will be of 15 minutes duration followed by a 5 minute question time. Use of audiovisual aids, such as Powerpoint, is expected.

**Fair assessment through moderation**
Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is consistently evaluated by assessors. Minimum standards for the moderation of assessment are described in the Assessment Manual, available from policies.curtin.edu.au/policies/teachingandlearning.cfm

**Late penalties**
This ensures that the requirements for submission of assignments and other work to be assessed are fair, transparent, equitable, and that penalties are consistently applied.

1. All assessments which students are required to submit will have a due date and time specified in the Unit Outline.
2. Accepting late submission of assignments or other work will be determined by the unit coordinator or Head of School and will be specified on the Unit Outline.
3. If late submission of assignments or other work is not accepted, students will receive a penalty of 100% after the due date and time i.e. a zero mark for the late assessment.
4. If late submission of assignments or other work is accepted, students will be penalised by ten percent per working day for a late assessment submission (e.g. a mark equivalent to 10% of the total allocated for the assessment will be deducted from the marked value for every day that the assessment is late). This means that an assignment worth 20 will have two marks deducted per working day late. Hence if it was handed in three working days late and marked as 12/20, the student would receive 6/20. An assessment more than seven working days overdue will not be marked. Work submitted after this time (due date plus seven days) may result in a Fail - Incomplete (F-IN) grade being awarded for the unit.

Referencing style
Students should use the Chicago referencing style when preparing assignments. More information can be found on this style from the Library website: library.curtin.edu.au/research_and_information_skills/referencing

Pass Requirements
To pass this unit you must complete all components of the assessment matrix and achieve a combined total mark of at least 50%

Supplementary information

Enrolment and HECS:
It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Supplementary/Deferred Exams:
Supplementary and deferred examinations granted by the School of Biomedical Science will be held in the week beginning 4th July, 2011. Notification to students will be made after the your Schools' Board of Examiners meeting via the Official Communications Channel (OCC) in OASIS (on welcome page- see Figure 1).

Figure 1 OCC
It is the student’s responsibility to check their OASIS account for official Curtin correspondence on a weekly basis. If your results show that you have been awarded a supplementary or deferred exam you should immediately check your OASIS email for details.

Please note the following:
1. Your final results are NOT available until after your school’s Board of Examiners meeting. This is held in the SECOND week AFTER the examination period. You CANNOT obtain your marks by calling your tutor or the unit coordinator, but must wait until the examinations office in central administration releases them in the week following the board meeting. These are published on the Curtin University website. Please do not contact us asking for your marks.

2. SUPPLEMENTARY and DEFERRED examinations are awarded only at the discretion of the Board of Examiners. It is your responsibility to be available at this time should a supplementary/deferred exam be awarded. **No other time** will be arranged.

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**Plagiarism**

Plagiarism occurs when work, or property of another person, is presented as one’s own, without appropriate acknowledgement or referencing. Plagiarism is a serious offence. For more information refer to [academicintegrity.curtin.edu.au](http://academicintegrity.curtin.edu.au)

**Plagiarism Monitoring**

All written assessments, and literature review, will be monitored for plagiarism using Turnitin (see [turnitin.com](http://turnitin.com)). Students who do not want assignments retained in the Turnitin database must lodge a special request prior to the submission date. For further advice see [academicintegrity.curtin.edu.au/studentsturnitin.html](http://academicintegrity.curtin.edu.au/studentsturnitin.html)

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**Student Rights and Responsibilities**

It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- the University’s Guiding Ethical Principles
- the University’s policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University’s policies on appropriate use of software and computer facilities

Information on all these things is available through the University’s "Student Rights and Responsibilities" website at: [students.curtin.edu.au/rights](http://students.curtin.edu.au/rights).
Recent unit changes

We welcome feedback as one way to keep improving this unit. Students are encouraged to provide unit feedback through eVALUate, Curtin’s online student feedback system (see evaluate.curtin.edu.au/info/). Recent changes to this unit include: an increase in the percentage associated with the mid-semester quiz and a reduction from 5 to 4 in the number of practical write-ups required to be handed in.

See evaluate.curtin.edu.au to find out when you can eVALUate this unit.

Academic problems

Students experiencing difficulties with the academic content of this unit should see the lecturer responsible for the subject matter presenting problems or the Unit Coordinator Dr Michaele Gardiner, whose details appear on the front page of this unit outline.

Internet/FLECS-Blackboard access problems

Any problems associated with internet/FLECS-Blackboard access should be addressed to Randy Strack at: R.Strack@curtin.edu.au
<table>
<thead>
<tr>
<th>WEEK</th>
<th>WEEK BEGINNING</th>
<th>TOPIC</th>
</tr>
</thead>
</table>
| 1    | 28/2/11        | Review of laboratory data from Prac 1  
The link between energy balance & body composition |
| 2    | 07/3/11        | Aspects of neuromuscular system & activity  
Bioenergetics, energy sources & metabolism |
| 3    | 14/3/11        | Energy transfer during exercise  
Prac write-up review |
| 4    | 21/3/11        | Neuroendocrine responses to exercise |
| 5    | 28/3/11        | Cardiorespiratory responses to exercise |
| 6    | 04/4/11        | What causes fatigue? |
| 7    | 11/4/11        | Are the limitations for VO_{2max} & endurance the same? |
| 8    | 18/4/11        | Gender factors in exercise performance |
| 9    | 25/4/11        | TUITION FREE WEEK |
| 10   | 02/5/11        | Ageing and physical performance |
| 11   | 09/5/11        | Growth & physical performance in childhood & adolescence |
| 12   | 16/5/11        | Training principles & adaptations in different exercise modes |
| 13   | 23/5/11        | Review |
| 14   | 30/5/11        | STUDY WEEK |
| 15   | 6-17/6/11      | UNIVERSITY EXAMINATION PERIOD |
**DEPARTMENT OF HUMAN BIOLOGY**

**WORK PHYSIOLOGY 331**

**LABORATORY PROGRAM: WEDNESDAYS 9 - 12 noon 405.229**

<table>
<thead>
<tr>
<th>TEACHING WEEK</th>
<th>WEEK BEGINNING</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28/2/11</td>
<td>Body composition, resting energy expenditure. Activity ratings. Setting up the class database</td>
</tr>
<tr>
<td>2</td>
<td>07/3/11</td>
<td>Aerobic capacity &amp; fitness testing</td>
</tr>
<tr>
<td>3</td>
<td>14/3/11</td>
<td>Anaerobic tests of muscle power</td>
</tr>
<tr>
<td>4</td>
<td>21/3/11</td>
<td>Efficiency of exercise</td>
</tr>
<tr>
<td>5</td>
<td>28/3/11</td>
<td>Muscle strength, endurance &amp; flexibility</td>
</tr>
<tr>
<td>6</td>
<td>04/4/11</td>
<td>Energy cost of walking &amp; running - 1</td>
</tr>
<tr>
<td>7</td>
<td>11/4/11</td>
<td>Energy cost of walking &amp; running - 2</td>
</tr>
<tr>
<td>8</td>
<td>18/4/11</td>
<td>QUIZ &amp; REVIEW</td>
</tr>
<tr>
<td>9</td>
<td>25/4/11</td>
<td>EASTER-TUITION FREE WEEK</td>
</tr>
<tr>
<td>10</td>
<td>02/5/11</td>
<td>Energy cost of positive and negative work</td>
</tr>
<tr>
<td>11</td>
<td>09/5/11</td>
<td>Upper body vs lower body exercise</td>
</tr>
<tr>
<td>12</td>
<td>16/5/11</td>
<td>Planning an exercise program</td>
</tr>
<tr>
<td>13</td>
<td>23/5/11</td>
<td>SEMINAR</td>
</tr>
<tr>
<td>14</td>
<td>30/5/11</td>
<td>STUDY WEEK</td>
</tr>
<tr>
<td>15</td>
<td>06-17/6/11</td>
<td>UNIVERSITY EXAMINATION PERIOD</td>
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