



Faculty of Medicine  
School of Medical Sciences

# HESC1501

## Introductory Exercise Science

COURSE OUTLINE

TERM 1, 2020

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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](http://medicalsciences.med.unsw.edu.au) )

## Staff Contact Details

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<b>Program Officer:</b>	<b>Ina Ismail</b>	UNSW Student Portal Web Forms <a href="http://unsw.to/webforms">http://unsw.to/webforms</a>

## Course details

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**Credit Points:** 6 UOC

### Course Description

HESC1501 (Introductory Exercise Science) is the first course in the *Bachelor of Exercise Physiology*. This course presents an overview of the vocational activities within the allied health profession of Exercise Physiology. The sub-disciplines of exercise science (exercise physiology, biomechanics, motor control and exercise psychology) and related biomedical sciences are introduced through examining how the body responds to physical activity. This course includes a clinical practicum component in the university's Lifestyle Clinic.

### Aims of the Course

1. To introduce the profession of Exercise Physiology, and issues relating to professional conduct
2. To introduce the sub-disciplines of exercise science: functional anatomy/biomechanics, motor control, exercise physiology, and exercise psychology
3. To encourage a basic understanding of the relationship between physical activity and health across the lifespan
4. To initiate learning of practical skills in exercise testing

## Student Learning Outcomes

This term is used to describe what it is that you should be able to do, explain or understand if you have learned effectively in the course. For each lecture, tutorial, practical and assessment item, the expected learning outcomes will be explicitly stated. The assessment in the course will be matched as closely as possible to the stated learning outcomes - that is, the assessment will test how well you have achieved the learning outcomes of the course. The general learning outcomes for the course are as follows:

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

- Describe the different sub-disciplines of exercise science and an appreciation of the interdisciplinary nature of exercise physiology.
- Explain the role and responsibilities of exercise physiologists in the provision of health care.
- Describe the processes involved in patient care, from initial patient referral through to exercise programming and delivery.
- Apply basic principles of movement analysis.
- Communicate effectively and concisely through written reports of scientific experiments or clinical experiences.

## Graduate Attributes

- Understand the relationship between physical activity and health
- Engage in independent and reflective learning for the betterment of professional clinical practice, following an evidence-based approach
- Communicate effectively with patients, colleagues and other health professionals
- Display a respect for diversity and a high standard of ethical practice

## Rationale for the inclusion of content and teaching approach

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### How the course relates to the Exercise Physiology profession

This course introduces the scientific basis of the exercise physiology profession. It also includes a series of clinical site visits, and lectures from accredited exercise physiologists, to provide an introductory overview of the activities of exercise physiologists in the workplace.

### How the course relates to other courses in the Exercise Physiology program

Basic skills and knowledge introduced in this course will be further developed throughout the program, in Exercise Programs and Behaviour (HESC1511), Biomechanics (BIOM2451), Exercise Physiology (HESC2501), Muscle and Motor Control (NEUR3101) and Physical Activity and Health (HESC3504). Interim courses in anatomy, physiology and biochemistry provide critical background on which to further your understanding.

## Course Resources

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

### Textbook

Abernethy, B., Kippers, V., Hanrahan, S., Pandey, M., McManus, A., & Mackinnon, L. (2013). *The Biophysical Foundations of Human Movement*. 3rd edition. Human Kinetics. ISBN: 1450431658  
UNSW Library call no. 612.044/62 R

The text is not compulsory however many chapters are broadly useful when revising the lecture content:

<i>Lectures 3-4</i>	<i>Chapters 3, 4, 5, 6 (Part II) (Functional Anatomy)</i>
<i>Lectures 5-7</i>	<i>Chapters 7-10 &amp; 17 (Part III) (Biomechanics)</i>
<i>Lectures 8-9</i>	<i>Chapters 15-18 (Part V) (Motor Control)</i>
<i>Lectures 11-15</i>	<i>Chapters 11-14 (Part IV) (Physiology)</i>
<i>Lectures 16-18</i>	<i>Chapters 5, 9, 13, 17, 21 (Exercise across the lifespan)</i>
<i>Lectures 19-20</i>	<i>Chapters 19-22 (Part VI) (Exercise Psychology)</i>

### Suggested Reference Books/Articles

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

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

### UNSW Learning Centre

The Learning Centre offers academic skills support to all students across all years of study enrolled at UNSW. This includes assistance to improve writing skills and approaches to teamwork. See [www.lc.unsw.edu.au](http://www.lc.unsw.edu.au)

### Course Evaluation and Development

Each year feedback is sought from students about the course and continual improvements are made based on this feedback. We will use myExperience to seek student feedback and use the feedback to make significant changes to the course for subsequent cohorts of students.

Based on the feedback received in recent years we have:

- including clinical sessions, which involves visiting the UNSW Medicine Lifestyle Clinic to observe AEPs in action.
- including regular lectures from practicing exercise physiologists (AEPs).
- adding online quizzes, and pre-lab and post-lab tasks to aid in learning.

Each of these initiatives is designed to enrich learning in this course and to engage students in the program. The increased clinical content has been well received by students. Student feedback is welcome and taken seriously. A [myExperience](#) survey will be available in the final weeks of the course to formally gather student feedback.

## Teaching Strategies

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**Lectures** – This approach is used to present relatively large amounts of information within a given time on specific topics throughout the course. PDF copies of the lecture notes will be available online (via Moodle) prior to or after each lecture, so you should be able to think about and develop an understanding of the lecture concepts as they are presented, rather than writing voluminous notes. However, there will be information and explanations presented in lectures in addition to those covered in the notes that you should take down if they help you to understand the material. The lecturer will also try to allow some time for interaction and activities in each lecture to provide you with an opportunity to clarify or reinforce the ideas that have been presented. You should take these opportunities to think about the information that has been presented and ask questions to enhance your understanding.

There are 20 lectures (each 1 hour) in this subject.

**Tutorials** – The **Q&A session** provides the opportunity to ask questions of final year students, academic staff and practicing AEPs. This is valuable in the early part of the program to help you confirm your interest in the field, to improve your understanding of progression through the program and to seek clarification about any areas of concern. The Q&A will be highly interactive and you are advised to come prepared with questions in mind. For example, you might like to ask questions about student experiences in the program, including such things as points of interest and tips for different stages in the program. You may also be interested to ask practicing AEPs about aspects of their professional work. There is also an introductory session covering professional and research skills and a final review session to help prepare you for the final exam.

There are 3 tutorials (each 1 hour).

**Laboratories** – The labs are designed to help you to develop technical skills that will be relevant in your professional career. It is essential that you obtain some hands-on experience with the major clinical and/or research techniques in exercise testing before you begin your clinical practicum. These skills will be rehearsed and developed further during subsequent courses in the program. The second purpose is to use experiments to demonstrate and reinforce key theoretical concepts that have been covered in lectures. The questions contained in the practical outlines will guide your learning in this respect.

There are 5 lab sessions (each 2 hours).

**Clinicals** – Clinical sessions are conducted in the Lifestyle Clinic under the guidance of an accredited Exercise Physiologist tutor. The sessions provide early exposure to a clinical environment and exercise physiology practice. This format provides a more informal learning environment than a lecture. Sessions will be structured to encourage your participation in activities and discussions designed to enhance your learning, in particular case studies of patient files from the clinic. You will benefit most if you do preparation prior to attending the session. *It is imperative that you adhere to the Lifestyle Clinic Code of Conduct (including the strict dress code) whilst in that clinical setting. Note: the hours of attendance at the clinicals will contribute towards your accreditation as an Exercise Physiologist, gained on completion of the degree in accordance with the governing body - Exercise & Sport Science Australia (ESSA) - guidelines.*

There are 5 clinical sessions (each 2 hours).

**Independent study** – There is insufficient time in the lectures, labs, tutorials and clinicals for you to develop a deep understanding of the concepts covered in this course. To achieve the learning outcomes that will be assessed, you will need to revise the material presented in the course regularly. You will probably also need to do additional reading beyond the lecture materials to learn effectively. Relevant additional resources, including textbook chapters, will be cited in each lecture.

**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 central teaching strategy in this course.

## Assessment

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Assessment of your learning in the course will be achieved through examinations, online tasks and two written reports. The examination format tests your ability to recall and communicate knowledge of the subject matter without outside resources and in a time-constrained context. These requirements are similar to those encountered when dealing with a client or patient in a face-to-face setting, or when communicating with other health professionals or researchers. The examinations will be designed to determine how well you have achieved the general learning outcomes outlined above, and the specific learning outcomes outlined in each lecture/practical/tutorial. The written reports will assess your ability to access and interpret scientific literature in the field of exercise science, and to communicate concisely in a written report based on: 1) a laboratory experiment and 2) clinical site visits. You will be required to perform similar tasks in many professional settings within exercise physiology practice or medical research. For example, you will refer to the scientific literature to inform clinical exercise prescription or present a scientific case for using a particular training method.

### Submission of Assessment Tasks

Reports are to be submitted electronically through Turnitin via Moodle.

### Penalties for late submission of assignments

In cases where an extension has NOT been granted, the following penalties will apply: For assignments submitted after **the due time (5pm due date)**, a penalty of 50% of the maximum marks available for that assignment will be incurred. A further 25% of the maximum possible allocated marks (i.e. a total of 75%) will be deducted from assignments which are at least 48 hours (2 days) late. Assignments received more than two (2) days after the due date **will not be allocated a mark**, however, these assignments **must** still be submitted to pass the course. Note: Online quizzes will close immediately at the 5pm deadline.

Summary of Assessments	Weight	Due Date
ASSESSMENT TASK 1 – ONLINE QUIZZES	10% (2% each quiz)	Quiz 1 – Week 3 (Tues 3 <sup>rd</sup> Mar 5pm) Quiz 2 – Week 5 (Tues 17 <sup>th</sup> Mar 5pm) Quiz 3 – Week 7 (Tues 31 <sup>st</sup> Mar 5pm) Quiz 4 – Week 9 (Tues 14 <sup>th</sup> Apr 5pm) Quiz 5 – Week 11 (Tues 28 <sup>th</sup> Apr 5pm)
ASSESSMENT TASK 2 – SYNOPSIS LABORATORY REPORT	15%	Week 7 (Wed 3 <sup>rd</sup> April 5pm)
ASSESSMENT TASK 3 – CLINICAL EXPERIENCE REPORT	25%	Week 9 (Wed 17 <sup>th</sup> April 5pm)
ASSESSMENT TASK 4 – END OF SESSION EXAMINATION	50%	Exam period

### Assessment Task 1 – Online Quizzes (10%)

There will be 5 online quizzes. Completing each quiz will earn 2% of the course grade, for a total of 10% for completing all quizzes. Marks are awarded once you have attained at least 90% correct on the quiz. Each quiz will comprise 20 questions, meaning you need at least 18 correct answers to earn the 2% grade. However, you can do the quiz as many times as required to reach this threshold. Most questions will be multiple-choice and there will be a large question bank for each quiz meaning you will not get the same questions each time you attempt the quiz. The questions are designed to reinforce concepts and skills covered in the lectures and aid in practice for the final exam. You should complete these quizzes independently.

## Assessment Task 2 – Synopsis Laboratory Report (15%)

You are to independently **summarise the research study task** completed during the lab conducted in week 5 (Lab 2 – Reaction time and motor learning). You are required to include with this summary a reference to a directly relevant journal article. Precise instructions for the format and content of this written report are included in the following pages. Pay close attention to the formatting and marking criteria (provided on Moodle) when writing this assignment. In scientific literature, this brief summary of an entire project is called an Abstract. To help prepare for this, search for and read a wide range of exercise-related research studies to see how good Abstracts are written.

A key purpose of this assessment task is to provide students with feedback on written work early in the course and early in your university studies. Use the feedback to improve your written work in subsequent assessment tasks.

### Learning Outcomes for the Synopsis Laboratory Report

- To develop and refine the skills to concisely and clearly explain the purpose, methods, results and conclusions from a scientific laboratory class in the form of a written report
- To reference a scientific journal article of relevance to the experiment
- To develop your ability to communicate effectively in the format of a written report and to adhere to specified formatting guidelines

### Synopsis Laboratory Report – Required Format

Word limit: **450 words**. Start with a title (15 words max). Your report will have 4 sections: **Introduction, Methods, Results, and Discussion** (~100 words each section). In scientific literature this summary report of the entire study is called an Abstract. Use bold type sub-headings (e.g. **Methods**) to clearly indicate each section.

This is your first attempt at scientific writing. You will be exposed to exercise-related scientific research literature and online search methods in the tutorial and some clinical sessions. Read many exercise-related scientific articles in preparation for this task – reading good articles, and seeing how an Abstract should look like, is a key to success in this task. Aim for a clear, concise and focused writing style. Avoid being overly verbose - writing things in overly grand terms. Also appreciate that scientific reports do not require excessively complicated writing. Certainly, precise expression of detail is often important, but if details are expressed in easy to understand language then critical details will be conveyed more clearly. **Introduction:** Set the context for your reader – outline the topic itself (e.g. reaction time change in relation to the number of available options). Refer to a closely-relevant study that has already been published on the topic – what did they find? State the aim(s) of the experiment.

**Methods:** Summarise the key procedures. Be concise and clear with the key details. For example, “the participant exercised on a stationary, friction-braked bike”, as opposed to “the person pedalled on a bike”. Write in paragraph form rather than bullet points.

**Results:** Present the key results/data. Describe the key data clearly to your reader. You can show a table or figure if you feel it will help (with correct labelling of the axes). Use the appropriate units when reporting results and do not feel compelled to list every data value you collected; stick to the key results.

**Discussion:** Outline the key finding(s) to your reader. Relate your finding(s) to those detailed in the similar published study that you referred to in the Intro – were they similar or very different findings to yours and theorise why (show some critical analysis). Add a final concluding statement summarising the study and the major finding(s).

### References

Jones, D.A., Smith, B.C. (2015). The measurement of reaction time and muscle activity. *Journal of Reaction Time*. 12, 3: 330-333.

[382 words]

Referencing scientific literature in your Abstract: You need to reference only 1 article, but search widely (PubMed, Google Scholar etc.) to find one with clear, direct relevance to the lab. Cite the reference appropriately within your text in the Intro and Discussion (e.g. A similar study by Jones & Smith (2015) reported that....) and then acknowledge with the full citation detailed in the Reference section at the end of your report. Use the Harvard referencing format as shown in the online tutorial provided on Moodle. Avoid directly quoting from the article – paraphrasing is key when detailing their findings. Our interest is seeing your writing quality, so plagiarism is unacceptable.

## Assessment Task 3 – Clinical Experience Report (25%)

Parts 1 and 2 of this assessment require you to choose ONE of the available case studies. Part 3 requires you to reflect on your experience at the Lifestyle Clinic. Part 4 assess quality of writing and presentation. Tasks for this report are to be answered on the '*Clinical Experience Report - submission template*' document available on Moodle. This document provides a guide of the expected length of your report.

### Learning Outcomes for the Clinical Experience Report

- To develop your understanding of clinical activities in an exercise physiology clinic and professional conduct issues surrounding these activities.
- To develop and refine the skills to briefly and clearly summarise scientific literature of relevance to exercise science and clinical exercise physiology practice.
- To develop your ability to communicate effectively in the format of a written report.

**Part 1 (18%): Choose ONE of the available HESC1501 Case Studies and complete the following details about the case study:**

- A. Patient Profiling** (what condition does the patient have, how were they referred, which specialists are involved in their care)
- B. Initial Assessment** (which initial assessments were performed? Provide the protocol used for ONE strength assessment and ONE aerobic assessment)
- C. Results & comparison to normative data** (tabulate the patient results and rank them according to normative data. Reference the norms)
- D. Exercise Program** (describe specific details of the exercise program – name of exercises - aerobic or resistance or both, key programming details such as number of exercises; intensity; volume)
- E. Progression Plan** (describe the progression of training over the weeks/months of training i.e. how did the Exercise Physiologist gradually change the exercise training sessions to ensure patient progression – what variables were altered and why? Give examples.)
- F. Re-assessment** (compare baseline results to re-assessment results, compare re-assessment results to norms. Comment on whether the client has improved.)

(1500 words max)

**Part 2 (3%): Explain how the Exercise Program in the case study was 'evidence-based'.** Find recent exercise research and/or current exercise guidelines based on that patient's chronic disorder. Use 2-3 references from scientific sources. What do the guidelines recommend for that patient group, or what did the recent research find is effective (or not effective) for that patient group? Did the Exercise Program broadly meet the current guidelines/recent research findings? What might you have done differently? (300 words max)

**Part 3 (2%): Reflect on your shadowing experience at the UNSW Lifestyle Clinic.** Your self-reflection essay may include: What are features of successful demonstration and explanation of exercise to clients? What is important to consider when monitoring a client who is performing exercise? What factors contribute to effective communication? What areas do you feel you need to improve personally in order to work effectively as an Exercise Physiologist in the future? (200 words max)

Overall quality of writing, formatting and presentation across the entire report is worth 2%.

Marking criteria will be provided on Moodle.



## Assessment Task 4 – End of Session Examination (50%)

The purpose of the exam is to test your understanding of the concepts covered in the entire course. The format will be multiple choice and short answer questions. The exam will be held during the end of session exam period. Final exam period is Sat 2 May to Friday 15 May 2020. Supplementary exam period is Mon 25 May to Fri 29 May 2020.

## General Information

### Official Communication

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All communication will be via your official UNSW email, please see [Advice for Student-Official Communication](#) for more details.

### Academic Integrity and Plagiarism

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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 [UNSW Student Code](#) outlines the standard of conduct expected of students with respect to their academic integrity and plagiarism. More details of what constitutes plagiarism can be found [here](#)

### Attendance Requirements

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Attendance is expected at all lectures and tutorials, and compulsory at all labs and clinicals sessions 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 may be awarded a grade of FAIL for the entire course. If absent for medical reasons, a medical certificate must be lodged with the convenor within 7 days of the time period of the certificate's expiry. No consideration will be given after this time except for truly exceptional circumstances. Arrival more than 15 minutes after the start of the class will be recorded as non-attendance. Although lecture recordings will be available, student participation is encouraged in the lectures and these are important to attend.

For additional details on the UNSW Policy on Class Attendance and Absence see [Policy on Class Attendance and Absence](#).

### Special Consideration

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Please see [UNSW-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 can apply for special consideration online. For more information about Special Consideration, please follow this link: <https://student.unsw.edu.au/special-consideration>

If your request for consideration is granted an alternative assessment will be organised which may take the form of a supplementary exam, increased weighting of the final exam, or an oral element. You cannot assume you will be granted supplementary assessment.

For the UNSW assessment information and policy, see:  
<https://my.unsw.edu.au/student/academiclife/assessment/AssessmentPolicyNew.html>

<https://student.unsw.edu.au/assessment>

## **Health and Safety**

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Class activities must comply with the NSW *Work Health and Safety Act 2011*, the *Work Health and Safety Regulation 2017*, and other relevant legislation and industry standards. It is expected that students will conduct themselves in an appropriate and responsible manner in order not to breach HS regulations and ensure a safe work/study environment for themselves and others. Further information on relevant HS policies and expectations is outlined at: [www.safety.unsw.edu.au](http://www.safety.unsw.edu.au)

## **Student Conduct**

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All students must accept their shared responsibility for maintaining a safe, harmonious and tolerant University environment. For *further information* see [www.student.unsw.edu.au/conduct](http://www.student.unsw.edu.au/conduct)

## **Student Equity and Diversity Issues**

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Students requiring assistance are encouraged to discuss their needs with the course convenor prior, or at the commencement of the course, or with staff in the Equitable Learning Services (previously known as SEADU) (9385 4734). Further information for students with disabilities is available at <https://student.unsw.edu.au/els>

## **Student Support Services**

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Details of the available student support services can be found at [Educational Support Services](#).

Details of counselling support services can be found at [Counselling and Psychological Services](#).

## **Appeal Procedures**

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Details can be found at Student Complaints and Appeals