

**SUBJECT TITLE:** Cardiovascular, Renal & Respiratory Systems Physiology

**SUBJECT CODE:** BMED71-212

**FACULTY WEBSITE:** <http://www.bond.edu.au/about/faculties/hsm>

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### **SUBJECT INFORMATION**

Year of Offer: 2009 Semester of Offer: 093

Degree Course(s) for which the Subject is designed: PGDipBioMedSc  
PGCertBiomedSc

Subject Prerequisite(s): BMED71-202 Human Structure & Function

#### **Contact Details of Subject Convenor:**

Subject Convenor: Dr. Catherine McDermott  
Assistant Professor

Room: Room 4.01 HSM Building  
Email: [camcderm@bond.edu.au](mailto:camcderm@bond.edu.au)  
Telephone: Office 559 54464  
Formal Student Consultation Time: TBA

#### **Teaching Details:**

Lectures 1 x 2 hr per week weeks 1 -12  
Labs 2 x 2 hr over semester weeks 3 or 4, 9 or 10  
Tutes 7 x 1 hr per week weeks 2 – 4, 6-7, 9-10  
Timetable: <http://timetable.bond.edu.au>

#### **Student Relations Officer details:**

**Christine Kira**  
Room 1.11  
Email [ckira@bond.edu.au](mailto:ckira@bond.edu.au)  
Telephone: 07 5595 4133  
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## **DESCRIPTION OF SUBJECT**

The subject will provide an understanding of the physiology of the respiratory, renal and cardiovascular systems with particular regard to the relationship between structure and function. The regulation of the systems and how they interact to maintain homeostasis will be examined. The pathophysiology of hypertension, heart failure and respiratory conditions such as asthma will be covered and the mechanism of action of drugs used in the treatment of some of these disorders will be discussed.

## **SUBJECT LEARNING OBJECTIVES**

At the end of the subject, the students should be able to:

- Demonstrate an understanding of the general physiological mechanisms controlling respiratory, renal and cardiovascular systems.
- Describe the pathophysiological changes that occur in hypertension, heart failure, asthma, emphysema, etc.
- Describe the physiological adaptations that occur at high altitude and during diving
- Explain the parts played by the autonomic nervous system and the endocrine system in regulating the heart, circulation, pulmonary resistance and renal function.
- List the main drug treatments for some of these conditions and explain their mechanisms of action.

## **THE RELATIONSHIP OF THE SUBJECT WITH OTHER SUBJECTS IN THE COURSE**

The content of this subject builds on foundational knowledge and skills developed in BMED71-202 Human Structure and Function. It is designed to complement and integrate with other physiology subjects within the program, including BMED71-211 Neuromuscular System Physiology, BMED71-213 Gastrointestinal, Endocrine and Reproductive System Physiology, BMED71-217 Pharmacological Systems and BMED71-218 Tissue and Cellular Pathology.

## **STUDENT LEARNING RESPONSIBILITIES**

Students are expected to take a significant level of responsibility for their own learning. Students are expected to “read around” the topic and consult a variety of other learning materials, rather than relying solely on the PowerPoint slides of each lecture content. Students are encouraged throughout the subject to take the initiative to identify, apply and integrate material from other subjects and other sources to the present subject.

## **SUBJECT ORGANISATION AND REQUIREMENTS**

This subject is designed to integrate lectures, tutorials and practical sessions. Attendance at all tutorial and practical sessions is compulsory. Students who are unable to attend due to illness must provide a valid medical certificate. Students will incur a penalty for non-attendance without a legitimate reason accepted by the subject convenor. The penalty will be 2% of the final percentage each time a student is absent from their class.

## RATIONALE FOR TEACHING METHODS IN THE SUBJECT

The lectures will develop themes and provide information to enable students to understand the detailed physiology of the cardiovascular, respiratory and renal systems. The tutorial sessions will provide opportunity for students to develop and refine analytical and problem solving skills, and to explore the application of material presented in lectures. In addition students will present special topics through a self-direct learning program at tutorial sessions which will help students to develop their communication and presentation skills. Practical sessions will allow students to apply their knowledge to practice and gain experience in various biomedical measurement and analysis methods.

## SUBJECT CONTENT

Subject content will include the following topics: the heart, vascular smooth muscle, neurohumoral control of the cardiovascular system, CNS integration of cardiorespiratory control, cardiovascular response to exercise, hypertension, angina, dyslipidemias, the lungs, oxygen and carbon dioxide transport, gas exchange, regulation of breathing, high altitude and underwater physiology, obstructive and restrictive disorders, the mammalian kidney and its regulation, osmoregulation and excretion, regulation of extracellular fluid volume, role of the kidney in regulation of blood pressure and acid-base balance, kidney failure. These topics will be further developed at tutorial sessions.

## ASSESSMENT FOR THE SUBJECT

Assessment Item	Value	Due Date
<i>Quiz 1</i>	5%	Week 5
<i>Quiz 2</i>	5%	Week 10
<i>Laboratory 1 Report</i>	7.5%	Week 5, Friday 4pm
<i>Laboratory 2 Report</i>	7.5%	Week 11, Friday 4pm
<i>Essay</i>	25%	Week 9
<i>Tutorials</i>	15% total	
- <i>Contribution to group learning</i>	(5%)	
- <i>Presentations</i>	(10%)	
<i>End-semester examination</i>	35%	Week 14

Quizzes: Two short quizzes (30 minutes) comprising multiple choice and short answer type questions will assess content from weeks 1-4 (held in week 5) and content from weeks 5-9 (held in week 10). These quizzes are designed to evaluate students' knowledge of subject objectives and ability to apply relevant knowledge to common clinical conditions.

Laboratory Reports: These reports are designed to integrate with and support the lecture content and provide students with experience in a range of laboratory skills. In addition, the preparation of a laboratory reports will develop the skills of data analysis, literature review and scientific writing.

Essay: This written assignment will allow assessment of the student's ability to retrieve information from appropriate sources, written communication skills and their ability to form logical discussion. The essay should be no more than 2000 words and will be due on week 9. Topics and assignment information will be provided in week two.

Tutorials: Students will be expected to undertake a number of hours of self-directed learning in this subject. As part of this self-directed program, students will prepare and present tutorial material and specialised topics on a number of weeks. This will allow assessment of the students oral communication skills.

End-semester examination: The final examination is held during Week 14 and will include multiple choice, short answer and short essay type questions. This 2-hour examination will evaluate the students' accumulated knowledge, critical thinking ability and application of knowledge on material presented throughout the whole semester.

All assessment in the Faculty of Health Sciences and Medicine is criterion- referenced rather than norm-referenced. That is, for all assessment students will be graded against pre-determined criteria. Marking criteria for laboratory reports will be made available to students in week 2 of semester.

Each item of assessment that is submitted for marking must have the Faculty of Health Sciences and Medicine Assignment coversheet with all relevant sections completed. The submitted material with the Faculty of Health Sciences and Medicine Assignment coversheet must be handed into Reception (Level 1, Faculty of Health Sciences and Medicine building) by the due date and time. A receipt of submission of the submitted assignment will be provided.

The allocation of the final grade based upon percentages obtained by the student for all assessment items, will be according to Faculty of Health Sciences and Medicine Assessment Policy (<http://www.bond.edu.au/hsm/Policies.htm>). The allocation of supplementary examinations will be determined by Faculty Assessment Board.

## **TEXTBOOKS AND OTHER LEARNING MATERIAL FOR THE SUBJECT**

### **REQUIRED**

Human Anatomy and Physiology, Marieb and Hoehn, 8<sup>th</sup> ed, Pearson, 2010

### **OTHER USEFUL TEXTS**

Textbook of Medical Physiology, Guyton and Hall, Elsevier, 2006  
Fundamentals of Anatomy and Physiology, Martini, Pearson, 2006  
Human Physiology, Sherwood, Thompson, 2004  
Human Physiology, Rhoades and Pflanzer, Thomson, 2003

Other readings will be provided via iLearn@Bond during the semester.

## GENERAL ADMINISTRATION, GUIDELINES AND POLICY FOR THE SUBJECT

### (i) Medical Certificates, Special Consideration and Deferred Assessments:

Students must read the information on the Bond University web page about deferred examinations (<http://www.bond.edu.au/handbook/> - see Part 2 Academic Regulations). The Dean of the subject Faculty may allow a candidate to sit for a deferred examination, subject to the provisions relating to special consideration, where a candidate can demonstrate genuine inability to sit a normal, set examination, either through illness or through other causes beyond their control. Students are required to apply for a deferred examination with supporting documentation, within 48 hours following the examination.

### (ii) Plagiarism

Your attention is drawn to the Bond University policy on Academic Misconduct (<http://www.bond.edu.au/handbook/> - see Part 3 Discipline Regulations). Students are requested to read this document which clearly spells out which behaviours constitute academic misconduct. Plagiarism is one type of Academic Misconduct.

### (iii) Communication Processes

- Students are encouraged to contact the Subject Convenor in person if they have any immediate queries about the subject. Contacting the Subject Convenor via email may result in a slower response.
- The Subject Convenor will be available for consultation two hours each week. The specific days and times will be finalised at the first lecture in consultation with the students, to ensure no timetable clashes.
- It is the responsibility of the student to be familiar with the subject outline and all other handouts related to the subject.
- Attendance at tutorials and practical/laboratory sessions is required and will be monitored. Attendance at lectures is strongly advised in order to understand many complex physiological mechanisms covered in this subject.

### (iv) Email Policy

The Subject Convenor will attempt to reply to emails in a timely fashion, however, the Subject Convenor cannot undertake to answer all emails from students. A response to an email may be delayed or an email may not be answered at all by the Subject Convenor if the email is deemed to be trivial (i.e. answerable by the student themselves with a little effort). For a rapid response, particularly to an urgent query, speak to the Subject Convenor after lectures/tutorials or make an appointment to see the Subject Convenor either within the weekly-allocated consultation time period or a time that is mutually agreeable to both parties.

### Grading Scale

Grade	Description	Mark Percentile Range
HD	High Distinction	85-100%
D	Distinction	75-84%
C	Credit	65-74%
P	Pass	50-64%
F	Fail	0 – 49%

### DISCLOSURE

- The subject BMED71-212 Cardiovascular, Renal and Respiratory Physiology has been structured to provide the highest quality student learning experiences within the constraints of available resources.