



## 8472 PHYSIOLOGY 231

Semester One, 2012

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<b>Unit study package number:</b>	08472
<b>Mode of study:</b>	Internal
<b>Tuition pattern summary:</b>	Lecture: 1.5 Hours, 2.0 Times Weekly Laboratory: 2.0 Hours, 1.0 Times Weekly.*
<b>Credit value:</b>	25 on the successful completion of this unit
<b>Pre-requisite units:</b>	Human Biology 134 OR Integrated Systems Anatomy & Physiology 100
<b>Co-requisite units:</b>	Nil
<b>Anti-requisite units:</b>	Nil
<b>Additional Requirements:</b>	Nil
<b>Result type:</b>	Grade: Mark
<b>Approved incidental fees:</b>	All fee information can be obtained through the Fees Centre. Visit <a href="http://fees.curtin.edu.au">fees.curtin.edu.au</a> for details.

\*Average over semester. Laboratory times vary depending upon the particular practical exercise

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<b>Scheduled times and Venues:</b>	Lectures:	Tuesdays 10.00-11.30pm, Room 201.413; Wednesdays 2.00-3.30pm, Room 408.2038.
	Practical:	Thursdays: 9.00–1.00pm, Room 405.229. Thursdays: 2.00–6.00pm, Room 405.229.

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<b>Unit Coordinator:</b>	Name:	Dr Phil Bourne
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	Building : Room:	308.221
	Consultation times:	Anytime office door open.

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<b>Administrative contact:</b>	Name:	Ms Jeanette McLeod
	Phone:	(08) 9246 7374
	Email:	J.McLeod@curtin.edu.au
	Building : Room:	308.122

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**Learning Management System:** FLECS - Blackboard ([oasis.curtin.edu.au](http://oasis.curtin.edu.au))

## Syllabus

**Cellular Physiology:** Cell membrane structure and composition; Active & passive mechanisms of membrane transport. Membrane potential. Movement of water & solutes across epithelia. Cellular mechanisms of absorption (small intestine, kidney & gallbladder). Cellular mechanisms of secretion (salivary, pancreatic & stomach glands; kidney). **Nerve/Muscle:** Action potentials; Neuromuscular transmission; Pacemaker cells. Electrophysiology of the heart. Skeletal, cardiac and smooth muscle: structure to function. Autonomic Nervous System: Receptors & effectors. **Cell Communication:** Chemical signalling; Gap junctions; Prostaglandins; Receptors & signal transduction; Intracellular messengers; Homeostasis. **Endocrine Physiology:** Chemistry, structure and synthesis; Principles of endocrinology; hypothalamic-pituitary interactions; TSH & Thyroid H; ACTH & Adrenal H; GIT Hormones; LH & FSH regulation of reproduction. **Energy Metabolism:** Fuel homeostasis and metabolic rate; Total-body energy balance. Endocrine control during absorptive and post-absorptive states. Temperature regulation.

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## Introduction

Physiology is the study of the functions of an organism. This unit looks at important physiological processes which occur within body systems which are essential for life. In the prerequisite units, Integrated Systems Anatomy & Physiology 100 and Human Biology 134, you were introduced to the structure and function of the systems of the human body. This unit takes this investigation one step further by examining in more detail some of the fundamental physiological processes of the body, e.g., absorption, secretion, communication, transport and movement. However, rather than taking a “systems” approach to the study of human physiology, Physiology 231 looks at these important processes, which are prevalent in several of the body’s systems, from a functional perspective.










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## Unit Learning Outcomes

On successful completion of this unit students can:

Unit Learning Outcomes	Graduate Attributes addressed:
1. evaluate key concepts and processes of human physiology and their contribution to the normal processes of life	 
2. demonstrate safe and competent laboratory skills in the practical investigation of physiological phenomena	 
3. demonstrate high levels of teamwork and technological skill in the collection of significant scientific data	 
4. critically evaluate physiological data using a wide range of appropriate literature	 
5. integrate critical concepts of physiology into wider scientific knowledge and make inferences about its value to understanding the diverse processes of life.	 

### Curtin's Graduate Attributes

	Apply discipline knowledge		Thinking skills (use analytical skills to solve problems)		Information skills (confidence to investigate new ideas)
	Communication skills		Technology skills		Learning how to learn (apply principles learnt to new situations) (confidence to tackle unfamiliar problems)
	International perspective (value the perspectives of others)		Cultural understanding (value the perspectives of others)		Professional skills (work independently and as a team) (plan own work)
Find out more about Curtin's Graduate attributes at the Office of Teaching & Learning website: <a href="http://otl.curtin.edu.au">otl.curtin.edu.au</a>					

### Laboratory Classes:

Students are reminded that **attendance of practical classes is compulsory**. Absenteeism for reasons other than medical, which must be supported with a medical certificate, will only be granted in exceptional circumstances, **with prior communication**. Students who absent themselves from practical classes without valid medical certificates may find that their evaluation marks for their continuous assessment are adjusted *pro rata*.

Physiology-based labs will be held in the Physiology Laboratory, Room 405.229. University safety regulations require that students wear **white lab coats** and suitable **closed-top shoes** for all practicals held in the laboratory area. Failure to comply with this rule may result in exclusion from the laboratory class. A statement on University regulations about Laboratory Safety Policy can be viewed at <http://www.edusafe.edu.au/curtin/policies/labsafety.html>.

### Learning Resources

#### Essential Texts

**Silverthorn, DU (2010)**. Human Physiology: An Integrated Approach (5<sup>th</sup> edit.); *Pearson Education Inc., publishing as Benjamin Cummings, San Francisco, USA.*

#### Recommended Texts

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

**#Silverthorn, DU and Hill, RD (2010)**. Student Workbook: Human Physiology: An Integrated Approach, (5<sup>th</sup> ed.); *Pearson Education Inc., publishing as Benjamin Cummings,*

**#Stabler, T, Peterson, G, Smith, L, Gibson, MC, Zanetti, N and Lokuta, A (2009)**. PhysioEx 8.0 for Human Physiology: Laboratory Simulations in Physiology. *Pearson Benjamin Cummings, San Francisco, USA.*

*#Recommended purchase from the University Bookshop*

**READING LIST:** All held in closed reserve in the library

- Alberts, B, Bray, D, Lewis, J, Raff, M, Roberts, K and Watson, JD (2002).** *Molecular Biology of the Cell* (4<sup>th</sup> ed.). *Garland Publishing Inc., New York, USA.*
- Becker, WM, Kleinsmith, LJ, Hardin, J and Raasch, J (2003).** *The World of the Cell* (5<sup>th</sup> ed.). *Benjamin/Cummings Publishing Company, San Francisco, California, USA.*
- Berne, RM and Levy, MN (2005).** *Physiology* (5<sup>th</sup> ed.). *C.V. Mosby & Company, St. Louis & Washington, USA.*
- Boron, WF and Boulpaep, EL (2003).** *Medical Physiology: A Cellular and Molecular Approach.* *Saunders Publishing, Philadelphia, USA.*
- Davies, A, Blakeley, AGH and Kidd, C (2001).** *Human Physiology.* *Churchill Livingstone, London, UK.*
- Ganong, W.F. (1999).** *Review of Medical Physiology* (19<sup>th</sup> ed.). *Appleton and Lange, Englewood Cliffs, New Jersey, USA.*
- Guyton, AC and Hall, JE (2000).** *Textbook of Medical Physiology* (10<sup>th</sup> ed.). *WB Saunders, Philadelphia, USA.*
- Jennett, S (1989).** *Human Physiology.* *Churchill Livingstone, Melbourne, Australia.*
- Johnson, L R (2003).** *Essential Medical Physiology* (3<sup>rd</sup> ed.). *Academic Press, San Diego, California, USA.*
- Martini, FH (2001).** *Fundamentals of Anatomy and Physiology* (5<sup>th</sup> ed.). *Prentice Hall, Englewood Cliffs, New Jersey, USA.*
- Martonosi, AN (1982).** *Membranes and Transport.* *Plenum Press, New York, USA.*
- Mathews, CK, van Holde, KE and Ahern, KG (2000).** *Biochemistry* (3<sup>rd</sup> ed.). *Benjamin/Cummings Publishing Company, Redwood, California, USA.*
- Patton, HD, Fuchs, AF, Hille, B, Scher, AM and Steiner, R (1989).** *Textbook of Physiology: Volumes 1 & 2.* *WB Saunders Company, Philadelphia, USA.*
- Pocock, G and Richards, CD (2004).** *Human Physiology: The Basis of Medicine* (2<sup>nd</sup> ed.). *Oxford University Press, Oxford, United Kingdom.*
- Rhoades, R. and Pflanzer, R. (2003).** *Human Physiology* (4<sup>th</sup> ed.). *Thomson Brooks/Cole Publishing, Pacific Grove, California, USA.*
- Rhoades, R and Tanner, GA (2003).** *Medical Physiology* (2<sup>nd</sup> ed.). *Lippincott, Williams & Wilkins, Philadelphia, USA.*
- Schmidt RF and Thews, G (1989).** *Human Physiology* (2<sup>nd</sup> ed.). *Springer-Verlag, Berlin.*
- Sherwood, L (2007).** *Human Physiology: From Cells to Systems* (6<sup>th</sup> ed.). *Thomson Brooks/Cole Publishing, Pacific Grove, USA.*
- Silverthorn, DU (2007).** *Human Physiology: An Integrated Approach* (4<sup>th</sup> edit.); *Pearson Education Inc., publishing as Benjamin Cummings, San Francisco, USA.*
- Vander, AJ Sherman, JH and Luciano, DS (2001).** *Human Physiology: The Mechanisms of Body Function* (8<sup>th</sup> ed.). *McGraw-Hill, Sydney, Australia.*

### Assessment Schedule

Task	Value (%)	Date due	Unit Learning Outcome(s) assessed
2 x 1hr Theory Tests	25%	Weeks 8 &13	1, 2, 5
Practical Workbook	25%	TBA	1, 2, 3, 4
Written Examination	50%	TBA	1, 4, 5

### Detailed information on assessment tasks

1. The Topic Tests will consist of MCQ and SAQ based upon lecture content.
  2. Practical assessment is based upon 4 practicals. For each, a prelab and lab worksheet/report must be completed and handed in for marking at the conclusion of your lab session. Failure to present either worksheet will result in total loss of marks for that component (see handout).
  3. The final examination will be a 3 hour extended-answer paper based on the lecture and practical material. There will be some choice. It will be a closed book exam, and conducted during the official university examination period.
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### 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](http://policies.curtin.edu.au/policies/teachingandlearning.cfm)

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### 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 on 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 ie 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 (eg 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.
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### Pass requirements

ALL ASSESSMENTS MUST BE COMPLETED AND PRESENTED FOR MARKING TO PASS THIS UNIT. Please note that it is the responsibility of the student to have all requested reports submitted by the due dates. Failure to fulfil this obligation without adequate reason may result in the loss of marks allocated for that particular assessment. Similarly, students are reminded that absenteeism from scheduled assessment and laboratory practicals must be supported with a valid medical certificate. Students choosing not to do so, will forfeit the mark allocated for that particular assessment.

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### **Referencing style**

Students should use the Chicago referencing style when preparing assignments. More information can be found on this style from the Library web site: [library.curtin.edu.au/research\\_and\\_information\\_skills/referencing](http://library.curtin.edu.au/research_and_information_skills/referencing)

### **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**

Work submitted may be subjected to a plagiarism detection process, which may include the use of systems such as 'Turnitin'. For further information see <http://academicintegrity.curtin.edu.au/students/turnitin.cfm>.

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### **Additional information**

#### **Enrolment:**

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 School of Biomedical Sciences will be held week beginning July 4<sup>th</sup>, 2012. Notification to students will be made after the School of Biomedical Sciences Board of Examiners meeting via the Official Communications Channel (OCC) in OASIS. 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.

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### **Student Rights and Responsibilities**

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

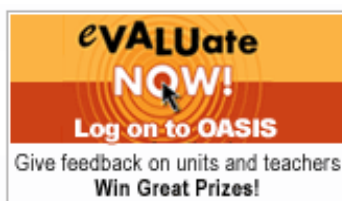
- the Student Charter
- the University's Guiding Ethical Principles
- the University's policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University's policies on appropriate use of software and computer facilities

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).

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### **Recent unit changes**

We welcome feedback as one way to keep improving this unit. Students are encouraged to give unit feedback through eVALUate, Curtin's online student feedback system (<http://evaluate.curtin.edu.au/info/index.cfm>).



<http://evaluate.curtin.edu.au/info/dates.cfm>

## PHYSIOLOGY 231 LECTURE SCHEDULE

### Semester 1, 2012

Tuesdays 10.00-11.30am, Room 201.413; Wednesdays 2.00-3.30pm, Room 408.2038

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Week No.	Date	Lecture Topics
1.	27 February	Cellular Physiology
2.	05 March	Cellular Physiology
3.	12 March	Nerve/Muscle Physiology
4.	19 March	Nerve/Muscle Physiology
5.	26 March	Cellular Physiology
6.	02 April	Cellular Physiology
7.	09 April	WEEK FREE FROM CLASS CONTACT
8.	16 April	Cellular Communication
9.	23 April	Endocrine Physiology
10.	30 April	Endocrine Physiology
11.	07 May	Endocrine Physiology
12.	14 May	Energy metabolism
13.	21 May	Energy metabolism
14.	28 May	STUDY WEEK
15.	04 June	EXAMINATIONS
16.	11 June	EXAMINATIONS

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## PHYSIOLOGY 231 PRACTICAL SCHEDULE

### Semester 1, 2012

**Groups A & C: Thursdays: 9.00 – 1.00pm, Room 405.229**  
**Groups B & D: Thursdays: 2.00 – 6.00pm, Room 405.229**

Physiology-based labs will be held in the Physiology Laboratory, Room 405.229. University safety regulations require that students wear **white lab coats** and suitable **closed-top shoes** for all practicals held in the laboratory area. Failure to comply with this rule may result in exclusion from the class.

Week	Week Beginning	GROUP A (am) or B (pm) Practical Topics	GROUP C (am) or D (pm) Practical Topics
1	27.02.12	NO PRACTICAL THIS WEEK	NO PRACTICAL THIS WEEK
2	05.03.12	Introductory Laboratory Session	NO PRACTICAL THIS WEEK
3	12.03.12	Membrane Transport (Physio Ex)	Introductory Laboratory Session
4	19.03.12	<b>RBC Fragility &amp; Permeability*</b>	Membrane Transport (Physio Ex)
5	26.03.12	Frog Heart (Physio Ex)	<b>RBC Fragility &amp; Permeability</b>
6	02.04.12	<b>Physiology of the Working Heart</b>	Frog Heart (Physio Ex)
7	09.04.12	<b>WEEK FREE (Easter)</b>	
8	16.04.12	Neurophysiology (Physio Ex)	<b>Physiology of the Working Heart</b>
9	23.04.12	<b>Nerve Action Potentials</b>	Neurophysiology (Physio Ex)
10	30.04.12	Skeletal Muscle (Physio Ex)	<b>Nerve Action Potentials</b>
11	07.05.12	<b>Physiology of Skeletal Muscle</b>	Skeletal Muscle (Physio Ex)
12	14.05.12	NO PRACTICAL THIS WEEK	<b>Physiology of Skeletal Muscle</b>
13	21.05.12	NO PRACTICAL THIS WEEK	NO PRACTICAL THIS WEEK
14	28.05.12	<b>STUDY WEEK</b>	
15/16	04-15 June	<b>WRITTEN THEORY EXAMINATION DURING THIS PERIOD</b>	

\*Practicals in **bold type** are those that will be assessed with completed worksheets/reports which are to be handed-in for marking; no extensions are permissible. For each, a prelab (to be handed-in at the start of the lab) and lab worksheet/report must be completed by the due date and presented for marking. Failure to hand-in either worksheet will result in total loss of marks for that component (see additional handout).