



THE UNIVERSITY OF  
NEW SOUTH WALES

DEPARTMENT OF PHYSIOLOGY  
SCHOOL OF MEDICAL SCIENCES

PHSL3221

# ENDOCRINE, REPRODUCTIVE AND DEVELOPMENTAL PHYSIOLOGY

SESSION 2, 2011

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# 1. COURSE STAFF

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## Other Teaching Staff (Lecturers)\*:

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\* consultation times by arrangement with specific staff member

## **2. COURSE INFORMATION**

### **2a) General Introduction**

Endocrine, Reproductive and Developmental Physiology is a 3<sup>rd</sup> year Science Course / Level III Physiology course usually undertaken upon successful completion of Physiology 1A (PHSL2101/2121/2501) and 1B (PHSL2201/2221/2502). It is worth six units of credit (6 UOC). The course usually forms part of a major in Physiology and/or Pharmacology in a Bachelor of Science or Bachelor of Medical Sciences degree.

This course has been developed with the aim of stimulating your interest and expanding your knowledge in the areas of endocrinology, reproduction, fertility and fetal development. The endocrine and reproductive physiology component builds on areas covered in Physiology 1B. The study of developmental physiology examines a wide range of organ systems and endocrine functions in the fetus, newborn and pregnant woman, and in this part of the course you will draw on your knowledge of these systems and processes from the relevant parts of Physiology 1A and 1B, and also your understanding of basic anatomy and biochemistry. The Level III Physiology subject most closely related to this course is Cardiovascular Physiology and Pathophysiology (PHSL3211).

The learning and teaching philosophy that underpins this course is our firm belief that a subject offered in the final session of your degree should not only develop a deeper understanding of physiology, but also foster the development of skills useful for your future career. All learning activities in the course are designed with this in mind.

### **2b) Aims**

This course aims to:

1. develop your understanding of the structure, function, control and pathophysiology of endocrine systems;
2. develop your understanding of the mechanisms associated with male and female reproduction and fertility;
3. provide you with an understanding of normal fetal growth and development, post-natal adaptation and survival, and maternal physiology;
4. develop your skills in teamwork, problem solving, communicating with peers, making presentations, independent learning, data analysis and report writing; and
5. stimulate an interest in and appreciation of biomedical research.

## 2c) Science Graduate Attributes, UNSW

UNSW aims to provide an environment that fosters in you the following qualities, skills and attributes during your time here as a Science student:

### Science Graduate Attributes, UNSW

- 1. Research, inquiry and analytical thinking abilities.**  
Technical competence and discipline specific knowledge. Ability to construct new concepts or create new understanding through the process of enquiry, critical analysis, problem solving, research and inquiry.
- 2. Capability and motivation for intellectual development.**  
Capacity for creativity, critical evaluation and entrepreneurship. Ability to take responsibility for and demonstrate commitment to their own learning, motivated by curiosity and an appreciation of the value of learning.
- 3. Ethical, Social and Professional Understanding.**  
Ability to critically reflect upon broad ethical principles and codes of conduct in order to behave consistently with a personal respect and commitment to ethical practice and social responsibility. Understanding of responsibility to contribute to the community. Respect and value social, multicultural, cultural and personal diversity.
- 4. Communication.**  
Effective and appropriate communication in both professional (intra and inter disciplinary) and social (local and international) contexts.
- 5. Teamwork, collaborative and management skills.**  
Ability to recognise opportunities and contribute positively to collaborative scientific research, and to perceive the potential value of ideas towards practical applications. Demonstrate a capacity for self management, teamwork, leadership and decision making based on open-mindedness, objectivity and reasoned analysis in order to achieve common goals and further the learning of themselves and others.
- 6. Information literacy.**  
Ability to make appropriate and effective use of information and information technology relevant to their discipline.

The generic UNSW Graduate Attributes can also be found at <https://my.unsw.edu.au/student/atoz/GraduateAttributes.html>

Endocrine, Reproductive and Developmental Physiology addresses each of these Science Graduate Attributes. Specific learning outcomes for the course, and the manner in which the course addresses the attributes, are outlined below.

## 2d) Specific Learning Outcomes

1. On completion of this course you should be able to demonstrate your knowledge and understanding of each of the three course themes outlined below [this relates to Science Graduate Attribute (SGA) 1]. You should be able to:

- 1a) better understand the structure, function and control of endocrine systems (weeks 1-6), including:
  - thyroid physiology and pathophysiology
  - insulin physiology; type 2 diabetes mellitus
  - endocrine control of body weight; endocrine functions of white adipose tissue
  - biosynthesis and actions of adrenal corticosteroids
  - anabolic steroids
  - the endocrine and renal response to water immersion
  - calcium metabolism and its hormonal control
  - the renin-angiotensin system

- 1b) better understand the science underlying male and female reproduction and fertility (weeks 5-7), including:
- changes with puberty, menopause and andropause
  - hormonal contraception
  - fertility and assisted reproductive techniques
- 1c) describe the main features of fetal growth, development and adaptation to life after birth (Weeks 7-13), including:
- cardiovascular development and the unique structural and functional aspects of the fetal cardiovascular system
  - fetal fluid regulation and renal function
  - fetal endocrinology
  - structure and functions of the placenta
  - lung development and fetal breathing movements
  - maternal adaptations to pregnancy
  - the transition from fetal to neonatal life, lactation and early infant nutrition

**In addition, after you have completed this course you should be able to:**

2. Use your knowledge of developmental physiology to develop an understanding of major areas of current interest in developmental research [SGAs 1 & 6], including:
  - developmental origins of health and adult disease
  - imprinting/epigenetics
  - the physiological basis of neonatal intensive care
3. Demonstrate an ability to contribute effectively in a group to solve a scientific problem. An effective contribution includes critical enquiry i.e. asking questions to clarify points/prompt scientific discussion [SGAs 1, 3, 4, 5].
4. Identify areas in your knowledge of physiology that could be improved, and carry out the self-directed learning necessary to “fill the gaps” [SGAs 1, 2, 6].
5. Research scientific information and communicate it to your colleagues and academic staff in written and oral format [SGAs 1, 4, 6].
6. Critically analyse and report on experimental data in the light of current information within the literature [SGAs 1, 2, 4, 6].
7. Conduct a focused literature search on a topic related to reproduction and developmental physiology and succinctly present this synopsis to your colleagues and academic staff [SGAs 1, 2, 4, 6].
8. Demonstrate some familiarity with examples of research in areas related to fetal physiology and development [SGAs 1, 6].

**2e) Teaching Strategies**

A variety of teaching strategies are used in this course:

**Lectures** introduce aspects of core material and insights into recent research and current practice. The course conveners both conduct their research in fetal and developmental physiology. We are also fortunate to have a large number of guest lecturers who are expert in their particular area of research or clinical practice. This means that you will gain an insight into both the basics and the latest issues relating to each of the course themes [specific learning outcomes 1 and 2].

The **problem based learning tutorials** (PBLs) will form a large part of your study of endocrinology. These are designed not only to develop your knowledge of endocrine physiology [specific learning outcome 1a], but also to encourage the development of self directed learning, teamwork, and

communication and presentation skills [specific learning outcomes 3, 4, 5]. More information about PBL tutorials is given later in these notes.

**Practical sessions and discussion classes** are designed to give you a deeper understanding of particular aspects of the course. The practical class '*Gestational diabetes and screening in pregnancy*' enables you to carry out a glucose challenge test, to learn more about gestational diabetes (a condition affecting 3-8% of pregnant women in Australia) and to examine screening principles including sensitivity, specificity, positive predictive value and negative predictive value [learning outcome 6]. You will consider the endocrine and renal control of circulating volume in the discussion class on '*Hormonal effects of water immersion*' [learning outcome 1a]. In the discussion class '*Cross-dressing or crossing over*' you will consider sex determination in humans and the issue of intersex [learning outcomes 1c and 3]. During a **visit to the neonatal intensive care unit** at the Royal Hospital for Women, Randwick you will have a 'once in a lifetime' opportunity to see how our understanding of fetal and neonatal physiology is applied to treating preterm infants [learning outcome 2]. You will also critically analyse and present a research topic related to reproduction, developmental or fetal physiology in the form of a **oral presentation** [learning outcomes 7 & 8].

### 3. ASSESSMENT

Component	Mark allocation
PBL classes	10%
Endocrinology assignment	10%
Oral presentation	10%
Exam 1 (Endocrine & Reproduction)	35%
Exam 2 (Developmental physiology)	35%
<b>Total</b>	<b>100%</b>

#### Details of assessment components and their rationale

The assessment components in this course are designed to help you to develop the skills outlined in the specific learning outcomes, as well as assessing your knowledge.

Problem Based Learning Classes. Your participation and presentations in three of the four problem based learning (PBL) classes contributes 10% to your final mark. A description of problem based learning and its assessment is included on the following pages.

Endocrinology Assignment. This written report based on a case study in endocrinology will contribute to 10% of your final mark and should be handed in to the BABS, SOMS, BEES Student Office (G27 Biosciences Building) by **12 midday Friday of Week 9 (23/9/11)**. Details about this assignment will be available on Blackboard. This exercise addresses the specific learning outcomes 1b, 4 and 5 (above). Please note that late submission of this assignment will incur a penalty.

Group Oral Presentation. In week 12, you will give an oral presentation in which you provide your colleagues with up to date information on a topic relating to reproduction, fetal or developmental physiology, which will constitute 10% of your final mark. You will work in small groups to prepare and present your talks, and you will be assessed both by your peers and by members of the academic staff. Each member of the group is expected to participate in the presentation and be able to answer questions on the topic. Attendance is required for the whole of this class (ie not just your own presentation). Topics and further details will be provided later in the session. The oral presentation session helps to achieve specific learning outcomes 1c, 2, 4, 5, 7 and 8.

Examinations. Two 90 minute examinations of equal weighting are given in this subject. The midsession exam will be held on **Thursday 1st September (Week 7)** and covers all material relating to the Endocrinology and Reproductive Physiology components of the course, including all the PBLs. The final exam will be held in the official examination period and assesses only the Fetal and Developmental Physiology component including the *Gestational diabetes and screening in pregnancy* practical class. All

course material presented prior to 1<sup>st</sup> September is examinable in the midsession exam. All course material presented from the 2<sup>nd</sup> September (inclusive) is examinable in the second exam. Each of these examinations will consist of multiple choice questions and short answer (5 minutes or 10 minutes) questions and are designed to help you achieve specific learning outcomes 1, 2 and 8.

### Online formative assessment

Formative assessment questions are available online (via blackboard). These questions are multiple choice and are of a similar nature to those that will be in the summative exams. We strongly recommend that you use these as a guide when studying for these exams and to provide feedback to help you learn.

### What other feedback can I get to help my learning and to get the most out of this course?

This is a challenging course and the course conveners are more than willing to help make this an interesting, satisfying way to end your 3<sup>rd</sup> year of studies. **Past exam questions** are given at the end of this outline, and you are encouraged to work through them to provide yourself with feedback on your progress. We will be holding a **practice exam questions and feedback session** before the midsession exam, and a **Fetal physiology Q & A session** before the final exam. You are encouraged to **ask questions during lectures, tutorials and discussion classes**. You will receive **ongoing feedback on your PBL participation and presentations** in the form of emailed comments and marks, and you can also **ask your PBL facilitator for feedback** regarding your presentations and participation in discussions. You will receive feedback as well as marks for your assignment and presentations. If you plan your oral presentation early you can **ask the course conveners for feedback** on your design/planned content. If there are any other ways in which you think that we can give you useful feedback, please let us know.

## 4. PROBLEM BASED LEARNING

### 4a) Introduction

Problem based learning provides an opportunity for you, working in a group with others, to determine what you need to know in order to solve a given problem. A facilitator/tutor is present in the class and you are provided with information relating to a clinical problem. The role of the facilitator is to maintain and/or provide direction for the group discussion, but not to lead the discussion. Each group will have approximately 10 students. Guidelines for how individuals within the group should interact will be discussed and determined by group members with guidance from the facilitator.

Throughout the group discussions a scribe lists relevant information extracted from the information provided, and from the group discussion, under the following three headings:

- 1) Known Information:** A summary of the important facts related to the case.
- 2) Hypotheses:** Possible hypotheses generated from the summarised information and the group discussion.
- 3) Learning Objectives:** During the group discussion you set Learning Objectives, a list of topics/questions, which will require further investigation and later reporting to the group. This is the most important part of the exercise. At the end of the first session for each PBL case the facilitator divides the list of topics/questions among the group. Each student researches a learning topic and the following week presents the information they have researched to their group.

This entire process aims to help you not only improve your understanding of endocrine and reproductive physiology (Specific Learning Outcomes 1 and 2, above) but also addresses outcomes 5, 6 and 7.

### 4b) PBL presentations – how to minimise your group’s workload!

These PBL presentations will probably occupy the majority of the time away from class that you allocate to the first part of the course. You must keep in mind that you will come away from each PBL session with information from at least 10 other students. PBL content is assessed in the exam and so you need to make sure that you are providing each other with effective study materials. A big part of what makes a good presentation in this context (and this is included in the marking scheme, below) is conciseness. Think about how effective your handout will be as a study guide for the rest of the group. Once it is



written, read through it and take out any unnecessary information. At the first PBL session, discuss with your group what rules you want to establish for giving presentations. These rules should be revised after the first round of presentations if necessary. Start with the following basics:

**Basic rules for PBL presentations**  
A strict five minute time limit (shorter if possible – remember that questions take extra time and that you need to get through ~10 presentations in 90 minutes).

1. Limit each presentation to 4 slides.
2. Limit handouts to a maximum of one page of text (diagrams can be extra if necessary).
3. A brief reference list is compulsory. Highlight any references you found particularly informative and which would be useful for the rest of the group to study from.

**4c) Assessment Criteria for Problem Based Learning Classes**

There are two major components in the assessment of the PBL classes:

- 1) **Class interaction.** For these sessions to work well, all members of the group need to participate in the discussion **to the best of their ability**. The facilitator will assess individuals on their **participation** in the group discussion of the topic. This assessment will take into consideration the contribution of the individual to group dynamics e.g. politeness, fairness, respect for the opinions of others, genuine interest in the learning process. If you are not used to working in a group and find this process intimidating, remember that making an effective contribution to the group can be something as simple as taking the initiative to read the information sheet aloud for the rest of the group, or asking somebody to repeat something that you did not understand. This would be regarded as “voluntarily contributing to the group discussion” (see marking scheme below).
- 2) **Reporting.** The second part of the assessment involves the reporting back and discussion of the Learning Objectives, which were allocated in the previous session. The emphasis of the assessment of this component is on how you present the information, and your ability to answer questions on your topic.

**Marking scheme:**

**Class Interaction – Assessed by facilitator during session 1 of PBLs 2-4**

Standard	Mark (out of 5)	Required Performance
Very Poor	0-1	- no participation in class discussion; not obviously listening to other group members
Poor	2	- minimal participation; only participated in response to direct questioning
Adequate	3	- participated in discussion voluntarily;
Good	4	- voluntarily contributed to the group discussion; provided insightful comments or questions
Very Good	5	- major role in group discussion without dominating the group and still allowing other members of the group to contribute

### Reporting – Presentation assessed by facilitator during session 2 of PBLs 2-4

Standard	Mark (out of 10)	Required Performance
Very Poor	0-2	- no research or preparation on allocated topic
Poor	3-4	- inadequate research on the allocated topic - explanation unclear or contains major errors
Adequate	5-7	- adequate research on the topic - information explained accurately - minor failure to comply with time limit, slide or handout requirements
Good	8-9	- topic researched thoroughly - information conveyed clearly and concisely - complied with time limit, slide and handout requirements - good understanding of topic and able to answer questions
Very Good	10	- topic researched thoroughly - information conveyed clearly and concisely - complied with time limit, slide and handout requirements - thorough understanding of topic and able to answer questions - able to relate their topic to the whole PBL

#### 4d) Are all four PBLs assessed? How will feedback be given?

We want you to use the first PBL to become familiar with the process of problem based learning and to get to know your group. After this PBL, your tutor will send you your assessment via email along with feedback regarding your participation and presentation. **This mark will not contribute to your final assessment.** The remaining 3 PBLs will be formally assessed and we encourage you to use the continuing feedback from your tutor to improve your participation and presentation skills.

#### 4e) How is problem based learning assessed in the exam?

You are not expected to have an intricate knowledge of all of the material covered during each PBL class for the midsession exam. However you should be able to demonstrate a broad understanding of the learning objectives outlined in each PBL, and be able to describe the physiology underlying each PBL case. In keeping with this, assessment of problem based learning in the exam will be largely by short answer questions, allowing you to demonstrate a broad understanding of the area, rather than by MCQs, which tend to assess specific aspects of your knowledge. Examples of questions relating to PBL classes in past exams are given at the end of this guide. MCQ questions in the formative assessment and practice exam on topics covered by the PBLs should also guide your learning.

## 5. ACADEMIC HONESTY AND PLAGIARISM

Students should be aware of UNSW's policy on academic and student misconduct:  
<https://my.unsw.edu.au/student/academiclife/assessment/AcademicMisconduct.html>

**Plagiarism or failure to acknowledge sources will not be tolerated in submitted work.** The University regards this as academic misconduct and imposes severe penalties. Written assignments may be tested for originality against source documents on the Internet and other submitted assignments using the originality detection software Turnitin. Evidence of plagiarism in submitted assignments, etc. will be thoroughly investigated and may be penalised by the award of a score of zero for the assessable work. Flagrant plagiarism will be directly referred to the Division of the Registrar for disciplinary action under UNSW rules.

Students should be familiar with the following:

## What is Plagiarism?

Plagiarism is the presentation of the thoughts or work of another as one's own.\* Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

[www.lc.unsw.edu.au/plagiarism](http://www.lc.unsw.edu.au/plagiarism)

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

\* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.

## 6. COURSE SCHEDULE AND ATTENDANCE REQUIREMENTS

The course timetable is attached at the end of these notes and can also be found on Blackboard. You are expected to attend all rostered activities for their full duration.

Several attendance requirements warrant special mention:

***Problem based learning tutorials.*** PBLs form a major part of your learning for the Endocrinology and Reproductive components of this course. You are relying on other members of your group to attend all sessions, carry out the necessary research and report back to the group, and they are relying on you to do the same. For both of these reasons attendance at all PBL sessions is compulsory. Non attendance for other than documented medical or other serious reasons, or unsatisfactory performance, will result in an additional assessment exam or in ineligibility to pass the course.

***Practical class 'Gestational Diabetes and Screening in Pregnancy.'*** Attendance is compulsory at this class. The class involves the use of human subjects and has been considered and approved by the university's Committee on Experimental Procedures Involving Human Subjects. Each student must read the details of this experiment carefully before embarking on it, and is required to raise any matters of concern with the person in charge of the class before the experiment has begun. You are expected to behave in a professional manner in this class and demonstrate respect for your colleagues during any experiment involving human subjects. Students volunteering to act as subjects will be required to sign witnessed informed consent forms. These will be distributed and collected in the practical class.

***The neonatal intensive care visit.*** Some students will have the opportunity to visit the Newborn Care Centre at the Royal Hospital for Women, Randwick, in practical sessions in weeks 9-11. Students will sign up to attend these classes on Blackboard. Unfortunately the hospital cannot accommodate all students. Students who are able to attend must appreciate that this is a tremendous privilege, and that there may be family members there for whom this is a very stressful time. Please dress appropriately, behave in a professional, respectful manner at all times, and follow any instructions given to you by hospital staff. It is essential that you wear closed in shoes or you will not be permitted into Newborn Care Unit. These staff are spending considerable time and effort to offer you this opportunity and if you volunteer to attend this class your attendance is compulsory.

***Two peas in a pod.*** Held concurrently with the neonatal intensive care visits. Your attendance and participation is essential.

***Presentation preparation time.*** Time has been allocated during at least one of the practical class sessions in weeks 9-11 to allow you to work on your presentation. You encouraged to use this time to get together with other group members to ensure that your presentation forms a cohesive whole.

***Imprinting film.*** You are not required to attend the class on the 10<sup>th</sup> October as this film is available on UNSWTV. Click on See all videos. Click on All UNSWTV Videos. Scroll down to the Faculty of Medicine and click on School of Medical Sciences. The video is called 'The ghost in your genes'. You will need to use your student number and unipass to access the video. Time has been allocated for you to watch this video in week 12, but you are free to view it at another time if you wish. It is strongly recommended that you view the video before attending the lectures in Week 13 as this will help you to understand these lectures.

***Lectures in week 13. Attendance at these lectures is expected.*** Due to limited availability of the visiting lecturer, these lectures are scheduled for the practical class session on Thursday 20<sup>th</sup> October. As such, it might not be possible to have these lectures available on iLecture. These lectures cover challenging topics which will definitely be examined in the Final Examination.

## 7. RESOURCES FOR STUDENTS

### 7a) Textbooks

There are no prescribed texts for this course. Ganong's 'Review of Medical Physiology' provides a very good coverage for the endocrine component of the course, while Harding & Bocking 'Fetal Growth and Development' is an excellent reference for developmental physiology. The others are more specialist textbooks which are held in the UNSW library and could be consulted as a reference if necessary.

*NOTE: Ganong's 'Review of Medical Physiology' is available as an online text through the UNSW library catalogue. Copies of all other texts have been placed in the MyCourse (Reserve) collection of the UNSW library.*

- Ganong, WF. *Review of Medical Physiology*. 23<sup>rd</sup> edition, 2010. Lange.
- Harding, R and Bocking, AD (eds). *Fetal Growth and Development*. Cambridge UP.
- Laycock, J & Wise, P. *Essential Endocrinology*. Oxford UP.
- Griffin, JE & Ojeda, SR (eds). *Textbook of Endocrine Physiology*. Oxford UP.
- Thorburn, G & Harding, R. *Textbook of Fetal Physiology*. Oxford UP.
- Nathanielsz, PW. *Life Before Birth and a Time to be Born*. Prometheus Press.

### 7b) Other Resources

- The learning activities may involve supplementary reference articles and printed lecture notes.
- For the PBLs you may find Harrison's online (a medical database, the online version of Harrison's Principles of Internal Medicine) and the Oxford Textbook of Medicine (electronic resource) useful resources. These can be accessed via the UNSW library catalogue.
- McPhee, SJ, Vishwanath, RL, Ganong, WF. *Pathophysiology of Disease: an Introduction to Clinical Medicine*. 4<sup>th</sup> Edition. In MyCourse (Reserve), UNSW library. This is likely to be helpful for the PBLs and the Endocrinology Assignment.
- *Blackboard*: Lecture notes, course-related material such as timetables and outlines, as well as supplementary articles may be placed on Blackboard. Marks for assessment tasks will also be posted here. Announcements will be made via Blackboard and it is your responsibility to regularly check this site.

## 8. CONTINUAL COURSE IMPROVEMENT

### 8a) CATEI

We are continually making changes to this course to keep it current and to make it a worthwhile experience for you. Each year we seek evaluative feedback from students using UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process. Your feedback is taken seriously, and the improvements we make to the course are based in part on such feedback. In recent years many students made the comment that although they very much enjoyed and valued the PBL classes, they felt that the workload involved was too large compared with what was expected from other courses. We reduced the number of PBL classes from 5 to 4, partly in light of this feedback. Students in 2008 asked for more feedback to help their learning. In response, in 2009 we provided feedback to each student via email following each PBL class, and produced two formative assessment tools. This feedback has been positively received by students and will continue in 2011. For 2011, we have changed the practical class

component of the course and introduced a new class (*Gestational diabetes and screening in pregnancy*). We have also changed one of the assessment tasks, by substituting an oral presentation instead of the previous poster presentation.

## **8b) Student panel**

While we welcome individual students providing us with feedback, your views regarding the course can also be put forward to the course convenors by a small panel of student representatives. These representatives will have the opportunity to meet with the course convenors during session to provide feedback on the course structure, learning activities and staff. We hope that this will be a useful avenue for you to make your views known while the course is running.

## **9. GENERAL INFORMATION**

The Department of Physiology in the School of Medical Sciences is located primarily on the 2<sup>nd</sup> and 3<sup>rd</sup> floors of the Wallace Wurth building and is within the School of Medical Sciences, Faculty of Medicine. The SOMS Student Advisor, Ms Carmen Robinson (Carmen.Robinson@unsw.edu.au, ph: 9385 2464, G27 Biosciences Building), is able to provide additional information on any courses offered by the School.

**Professor Gary Housley** is Head of Department and appointments may be made directly with him (g.housley@unsw.edu.au or phone 9385 1057).

### **SCHOOL OF MEDICAL SCIENCES HONOURS PROGRAM**

There is an Honours program conducted by the School. This program is coordinated by Dr Patsie Polly (patsie.polly@unsw.edu.au, Room 508 WW, ph: 9385 2924). Any students considering an Honours year should discuss the requirements with Dr Polly. Outstanding students may be considered for scholarships offered annually by the University and School.

### **POSTGRADUATE RESEARCH DEGREES**

The Department offers students the opportunity to enter into the following graduate programs:

**Doctorate (PhD):** For further information contact the coordinator, Dr Pascal Carrive (p.carrive@unsw.edu.au).

### **VACATION SCHOLARSHIPS**

The School of Medical Sciences several vacation scholarships each year to enable good students to undertake short research projects within the Department. For further details contact the Student Advisor, Carmen Robinson.

### **BEHAVIOUR IN PRACTICAL CLASSES**

Students must take due care with biological and hazardous material and make sure all equipment is left clean and functional. Covered shoes are compulsory in all practical classes. Please note that photography of experiments involving either animal or human subjects is not permitted under UNSW Ethics committee guidelines.

### **CONSENT FORMS**

Practical classes involving your participation as a subject require you to sign a witnessed, informed consent form.

### **OFFICIAL COMMUNICATION BY EMAIL**

Students are advised that email is now the official means by which the School of Medical Sciences at UNSW will communicate with you. All email messages will be sent to your official UNSW email address (e.g., z1234567@student.unsw.edu.au). If you do not wish to use the University email system, you MUST arrange for your official email to be forwarded to your chosen address. The University recommends that you check your email at least every other day. Facilities for checking email are

available in the University Library. Further information and assistance is available from UNSW IT Services, 9385 1333. Free email courses are run by the UNSW Library.

### **UNSW Blackboard**

To access UNSW Blackboard go to:

<http://telt.unsw.edu.au/>

Click on Login to UNSW Blackboard then log on using your zPass Username and Password. zStudentNo and password) and select the course PHSL3221. You should have access to it if you are properly enrolled.

#### *System Requirement for BBL:*

UNSW Blackboard supports the following web browsers for Windows XP or VISTA.

- Internet Explorer (IE) version 7 or 9
- Firefox 3.0x (must run version 3.0.3 and above)

UNSW Blackboard supports the following web browsers for Mac 10.4 or 10.5 (Mac OS 10.3 is not supported)

- Firefox 3.0.x(must run version 3.0.3 and above)
- Safari 2 or 3

*Firefox is the preferred browser in both PC & Mac environment.*

### **HANDWRITING**

Students whose writing is difficult to understand will disadvantage themselves in their written assessment. Make every effort to write clearly and legibly. Do not use your own abbreviations.

### **APPLICATIONS FOR SPECIAL CONSIDERATION**

Students who miss an assessment through sickness or misadventure, or believe that their performance has been adversely affected by sickness, misadventure or other circumstances beyond their control, must submit an application for consideration within **three working days** to UNSW Student Central. Special considerations sought outside the 3 day time period WILL NOT be accepted except in TRULY exceptional circumstances. Full details for the application (e.g., Medical Certificate, etc.) are available at <https://my.unsw.edu.au/student/atoz/SpecialConsideration.html>

You should also contact the course convenors to inform them that you have applied for special consideration.

### **MISSED EXAMS**

If in any circumstances you unavoidably miss an examination, you must inform the Registrar and also contact the relevant course authority immediately. Normally, if you miss an exam (without medical reasons) you will be given an absent fail. If you arrive late for an exam, no time extension will be granted. It is your responsibility to check timetables and ensure that you arrive with sufficient time.

### **DEFERRED EXAMS**

If you miss an exam for medical reasons you must supply adequate documentation (including a medical certificate) to UNSW Student Central within 3 working days of the date of the exam. Your request for consideration will then be assessed and a deferred exam may be granted. You cannot assume you will be granted supplementary assessment. It is intended that supplementary exams for the School of Medical Sciences in Semester 2, 2011 will be held in the week commencing Monday 5<sup>th</sup> December, 2011. The supplementary exam may include a significant oral element.

### **MEDICAL CERTIFICATES**

Students who miss classes due to illness or for other reasons must submit a copy of medical certificates or other acceptable documentation to Dr Boyce or Dr Gibson. **Certificates should be lodged no more than 7 days after an absence. Certificates lodged after 7 days will not be accepted.** The following details must be attached:

Name, Student number, Course number, Date of the class, Name of class/es missed.

## STUDENT RIGHTS AND RESPONSIBILITIES

Refer to <https://my.unsw.edu.au/student/resources/Policies.html#StudentResponsibilities&Conduct>

## STUDENT SUPPORT SERVICES

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course conveners prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or <http://www.studentequity.unsw.edu.au/content/default.cfm?ss=0>)

Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

## APPEAL PROCEDURES

Refer to

<https://my.unsw.edu.au/student/academiclife/assessment/academicstandinghowtoappeal.html>

## GRIEVANCE OFFICER

In case you have any problems or grievance about the course, you should try to resolve it with the Course Conveners. If the grievance cannot be resolved in this way, you should contact the Head of Department, Prof Gary Housley, or the School's Grievance Officer, Dr Priti Pandey ([p.pandey@unsw.edu.au](mailto:p.pandey@unsw.edu.au), 9385 2483).

## 10. PAST EXAMINATION QUESTIONS

### MID SESSION EXAMINATION, SEPTEMBER, 2006

1) 25 multiple choice questions (a mixture of A to E and K-code) in 50 minutes.

2) 6 short answer questions in 40 minutes:

Question 1. (5 minutes).

Describe the renal effects of head-out water immersion. What are the hormonal mechanisms underlying these effects?

Question 2. (5 minutes).

For each of the 4 gut hormones: gastrin, cholecystokinin (CCK), secretin and gastric inhibitory peptide (GIP), briefly describe: (a) its site of production, (b) its stimulus for release, and (c) its major action.

Question 3. (5 minutes)

Harry and his partner Sue are both 40 years old and have been trying unsuccessfully to conceive for 18 months. Briefly describe the factors which might be contributing to their infertility.

Question 4 (5 minutes).

Compare and contrast menopause and "andropause".

Question 5 (10 minutes).

The following test results were taken from an 8 year old child with a history of precocious sexual development:

	Patient level	Normal level
Plasma:		
11-deoxycortisol	10-30 $\mu\text{g}/100\text{ mL}$	<0.1 $\mu\text{g}/100\text{ mL}$
ACTH	500 $\text{pg}/\text{mL}$	30-120 $\text{pg}/\text{mL}$
Aldosterone	3 $\text{ng}/100\text{ mL}$	5-20 $\text{ng}/100\text{ mL}$



Urine:

17-ketosteroids	15-20 mg/24h	<0.5 mg/24h
Tetrahydrocompound S	1 mg/h	<0.5 mg/h

- a) Briefly explain why each of these results might be abnormal.
- b) Why might there be ambiguous genitalia?
- c) This child is hypertensive. What is the most likely reason for this?
- d) Why might this child be treated with daily cortisone?

**Question 6** (10 minutes).

A 20 year old woman has been brought unconscious into the emergency department by her worried boyfriend. He says that she has always been in good health, but has been feeling unwell for the past day or so. She has also been very thirsty and has been drinking "lots of water". Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	Patient result	Normal result	Brief explanation
Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released \*\*\*\*\*

**FINAL EXAMINATION, NOVEMBER, 2006**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

Question 1. (10 minutes)

"The fetus is a miniature adult." Discuss, with reference to two organ systems.

Question 2. (10 minutes)

Describe how the fetus responds to an acute fall in oxygen availability. How does this differ from the responses observed when the fetus has been hypoxic for some time (chronic hypoxia)?

Question 3. ( 5 minutes)

Why would removal of the maternal ovaries cause abortion of a human pregnancy at 5 weeks LMP but not at 12 weeks LMP?

Question 4. (5 minutes)

Briefly describe the composition, formation and importance of lung liquid.

Question 5. (5 minutes)

- (a) How long is gestation in humans and what is meant by the terms "Preterm" and "Post-term"?
- (b) A woman with a regular 28 day menstrual cycle has recently discovered that she is pregnant. If her last menstrual period had commenced on the 10th of October 2006, what is her estimated date of delivery?

(c) List 6 important risk factors for premature labour.

Question 6. (5 minutes)

Why does the newborn, especially the premature newborn, have difficulty maintaining its body temperature?

Question 7. (5 minutes)

What are fetal breathing movements? Briefly describe the major factors that control them.

Question 8. (5 minutes)

What do you understand by the term “fetal programming”? Include an example in your answer.

### **MID SESSION EXAMINATION, SEPTEMBER, 2007**

**1) 25 multiple choice questions (a mixture of A to E and K-code) in 50 minutes.**

**2) 6 short answer questions in 40 minutes:**

Question 1. (5 minutes)

An overweight friend has been following a sensible low fat low calorie diet for 3 months. In the first 2 months on the diet, he lost weight every week. Now, however, his weight loss has slowed down to almost nothing, despite the fact that he continues to follow the diet. He still needs to lose more weight. Your friend wonders why he has stopped losing weight. How would you explain this phenomenon to him (in lay terms)?

Question 2. (5 minutes)

Describe the hormonal changes which occur in the hypothalamic-pituitary-gonadal axis at the onset of puberty. What factors influence the timing of puberty?

Question 3. (5 minutes)

Harry and his partner Sue are both 40 years old and have been trying unsuccessfully to conceive for 18 months. Briefly describe the factors which might be contributing to their infertility.

Question 4. (5 minutes)

Physical examination and blood and urine tests taken from a 6 year old child with a history of precocious sexual development revealed the following:

	<b>Patient level</b>	<b>Normal level</b>
<u>Physical examination</u>		
Height	130 cm	95th percentile = 125 cm
Weight	33 kg	95th percentile = 27 kg
Blood pressure	150/90	~ 100/70
<u>Plasma</u>		
11-deoxycortisol	10-30 µg/100 mL	<0.1 µg/100 mL
ACTH	500 pg/mL	30-120 pg/mL
<u>Urine</u>		
17-ketosteroids	15-20 mg/24h	<0.5 mg/24h
Tetrahydrocompound S	1 mg/h	<0.5 mg/h

What do you think is the likely diagnosis? Briefly explain why each of the above results might be abnormal.

Question 5. (10 minutes)

- What is glycaemic index?
- Describe in detail how you could measure the glycaemic index of a new brand of biscuits available in supermarkets and classify the biscuits as low, medium or high GI.
- What is glycaemic load?

(d) Which of these terms (glycaemic index or glycaemic load) do you consider to be the more useful and why?

**Question 6.** (10 minutes)

A 20 year old science student has been brought unconscious into the emergency department late at night by her worried parents. They say that she has always been in good health, but has been feeling unwell for the past few days. They had wanted her to go to her local doctor yesterday but she had said that she was too busy studying for exams. She has also been very thirsty and has been drinking “lots of water”. Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	<b>Patient result</b>	<b>Normal result</b>	<b>Brief explanation</b>
Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released\*\*\*\*\*

**FINAL EXAMINATION, NOVEMBER, 2007**

**1) 25 multiple choice questions (a mixture of A to E and K-code) in 50 minutes.**

**2) 6 short answer questions in 40 minutes:**

**Question 1.** (10 minutes)

Describe the maternal changes that occur during pregnancy in

- (a) blood volume and composition
- (b) the cardiovascular system.

**Question 2.** (10 minutes)

Write short notes on

- (a) fetal programming of Syndrome X
- (b) chimeras and maternal disease
- (c) maternal diet, renal development and high blood pressure in adult life.

**Question 3.** (5 minutes)

- (a) List the main fluxes of fluid into and out of the amniotic cavity during fetal life.
- (b) List the functions of amniotic fluid.

**Question 4.** (5 minutes)

Briefly describe the adaptations that enable fetal survival despite an arterial oxygen tension that is only about 20% of healthy adult values.

**Question 5.** (5minutes)

- (a) How long is gestation in humans and what is meant by the terms “Preterm” and “Post-term”?
- (b) A woman with a regular 28 day menstrual cycle has recently discovered that she is pregnant. If her last menstrual period had commenced on the 10th of October 2007, what is her estimated date of delivery?
- (c) List 6 important risk factors for premature labour.

Question 6. (5 minutes)

Why does the newborn, especially the premature newborn, have difficulty maintaining its body temperature?

**MID SESSION EXAMINATION, SEPTEMBER, 2008**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 40 minutes:**

Question 1. (10 minutes).

Peter is an 18 year old gym member who has been injecting himself with Sustanon (testosterone esters) and tamoxifen (a selective estrogen receptor modulator), weekly for the past 6 months. He visits his GP with concerns that he is developing tender swellings on his chest, either side around the area of his nipples (gynaecomastia). On examination it is found that his testes are soft and small.

- a) Describe the physiological effects of anabolic steroids which entice people like Peter to self administer these drugs.
- b) What is the rationale for taking tamoxifen in conjunction with Sustanon?
- c) Why has Peter developed gynecomastia?
- d) What is the likely explanation for the findings regarding his testes?

Question 2. (10 minutes).

A 20 year old science student has been brought unconscious into the emergency department late at night by her worried parents. They say that she has always been in good health, but has been feeling unwell for the past few days. They had wanted her to go to her local doctor yesterday but she had said that she was too busy studying for exams. She has also been very thirsty and has been drinking "lots of water". Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	<b>Patient result</b>	<b>Normal result</b>	<b>Brief explanation</b>
Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released \*\*\*\*\*

Question 3. (5 minutes)

Describe the mechanisms of action of the combined oral contraceptive pill.

Question 4 (5 minutes).

Belinda is a 38 year old mother of two and a substitute teacher. Over the last 2 years she has gradually gained 10 kg of weight. She has been feeling depressed and chronically exhausted. She feels cold all the time, and now her hair is starting to fall out. She has also been constipated despite the fact that she eats a healthy high-fiber diet and drinks plenty of water.

On examination she has a soft swelling in her neck which moves on swallowing.

Blood test results were:

T4	2 µg/100 ml	(normal 4 – 11 µg/100 ml)
TSH	>10 mU/L	(normal 0.5-5.0 mU/L)

Explain the physiology behind Belinda's symptoms, signs and blood results.

Question 5 (5 minutes).

Rebecca and her partner Brett have been trying unsuccessfully to conceive for the past 18 months, since Rebecca ceased taking the oral contraceptive pill.

- How could you assess whether Rebecca was ovulating?
- Brett provided a semen sample for analysis. What would you consider to be a normal result?

Question 6 (5 minutes).

Matthew is 8 years old and is the shortest child in his class at school. He is concerned that he will always be short. Describe the factors which determine final adult height.

Question 7 (5 minutes)

Explain what is meant by the terms 'glycaemic index' and 'glycaemic load' and how these values are determined.

Question 8 (5 minutes)

A 52 year old woman who is otherwise healthy, presents to her GP suffering from hot flushes, night sweats and insomnia.

- What changes occur in the hypothalamic-pituitary-ovarian axis as women age?
- What other signs and symptoms are likely to occur around menopause and why?

## **FINAL EXAMINATION, NOVEMBER, 2008**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

Question 1. (10 minutes)

Use your knowledge of maternal physiology to explain the mechanisms underlying each of the following conditions which are commonly experienced by pregnant women:

- ankle swelling
- supine hypotension
- anaemia
- warm hands and feet even when the weather is cold
- glycosuria.

Question 2. (10 minutes)

"The fetus is a miniature adult." Discuss, with reference to the cardiovascular system and at least one other body system.

Question 3. (5 minutes)

Describe the cycle of events that is likely to result in fetal death when there is a sustained fall in oxygen availability of more than 50%.

Question 4. (5 minutes)

Write brief notes on how the following affect fetal breathing movements:

- A reduction in fetal arterial oxygen tension ( $P_{aO_2}$ ).
- An increase in fetal arterial carbon dioxide tension ( $P_{aCO_2}$ ).
- Fetal asphyxia (reduced  $P_{aO_2}$  **and** increased  $P_{aCO_2}$ ).

**Very briefly** comment on the effects that these three changes in blood gases would have on alveolar ventilation in an adult.

Question 5. (5minutes)

What is the evidence that renal development can be programmed?

Question 6. (5 minutes)

Compare and contrast fetal urine and fetal lung liquid.

Question 7. (5 minutes)

Describe the human placenta. In what ways does the sheep placenta differ from the human placenta?

Question 8. (5 minutes)

Lisa, a mother who is breast feeding her 5 month old baby, is concerned that her periods have not yet returned. Her friend Joanna, who delivered her baby only 4 months previously has already had two normal periods. Joanna is bottle feeding her baby. Use your knowledge of the physiology of lactation to explain Lisa's amenorrhea.

**MIDSESSION EXAMINATION, SEPTEMBER 2009**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

Question 1. (10 minutes)

A 6 year old child with a history of precocious sexual development presents to a paediatric endocrinologist. Physical examination and blood and urine tests revealed the following:

	<u>Patient level</u>	<u>Normal level</u>
<u>Physical examination</u>		
Blood pressure	150/90	~ 100/70
<u>Plasma</u>		
11-deoxycortisol	10-30 µg/dL	<0.1 µg/dL
Cortisol	not detected	5-25 µg/dL
ACTH	500 pg/mL	30-120 pg/mL
Aldosterone	0.1 ng/dL	3-10 ng/dL
<u>Urine</u>		
17-ketosteroids	15-20 mg/24h	<0.5 mg/24h

- (a) What do you think is the likely diagnosis?
- (b) Explain why each of the above results might be abnormal.
- (c) Why was this child given glucocorticoid treatment?

Question 2. (10 minutes).

A 20 year old science student has been brought unconscious into the emergency department late at night by her worried parents. They say that she has always been in good health, but has been feeling unwell for the past few days. They had wanted her to go to her local doctor yesterday but she had said that she was too busy studying for exams. She has also been very thirsty and has been drinking "lots of water". Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	<b>Patient result</b>	<b>Normal result</b>	<b>Brief explanation</b>

Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released \*\*\*\*\*

Question 3. (5 minutes)

You are having a conversation with a health conscious friend. He has heard about the glycaemic index and has decided to only eat foods that are labelled “low GI”. Given your knowledge of the glycaemic index and how it is measured, do you think that this is a sensible diet regime? Justify your answer.

Question 4. (5 minutes)

Describe how the ratio of testosterone to epitestosterone can be used to detect testosterone use in performance athletes. Include in your answer a description of methods that could be used to escape detection (i.e. to produce a normal ratio), and an explanation of their physiological basis.

Question 5. (5 min)

This question relates to the progesterone only pill (minipill).

- Briefly describe the mechanisms of action of this pill.
- Under what circumstances might women take this pill?
- How effective is this pill?

Question 6. (5 minutes)

What effect does head-out water immersion have on renal sodium excretion? Explain the mechanisms by which this occurs.

Question 7. (5 minutes)

Name three gut peptides that regulate food intake or energy homeostasis and describe (a) the sites of their synthesis, (b) the stimulators for their release and (c) their major physiological actions.

Question 8. (5 minutes)

Your 16 year old niece is concerned that she has not yet had her first menstrual period. Given your knowledge of puberty and the factors which influence the timing of puberty, what advice would you give her? How could you assess if her pubertal development has commenced?

**FINAL EXAMINATION, NOVEMBER 2009**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

Question 1. (10 minutes).

“The fetus is a miniature adult.” Discuss, with reference to the respiratory system and at least one other body system.

Question 2. (10 minutes).

What is the evidence that renal development can be programmed? Give examples of approaches (experiments, animal models etc) that could be used to examine this phenomenon.

Question 3. (5 minutes).

- Describe the changes that occur in the maternal cardiovascular system during pregnancy.
- Why should hospital staff not leave pregnant women lying supine for extended periods?

Question 4. (5 minutes).

(a) Describe the functions of amniotic fluid.

(b) What problems result from oligohydramnios and polyhydramnios?

Question 5. (5 minutes).

The fetus consumes twice as much oxygen per kg body weight as the newborn, and yet its oxygen supply is much lower. Describe how it has adapted to develop in a low oxygen environment.

Question 6. (5 minutes).

Draw a graph showing luteinising hormone (LH) levels from 10 weeks gestation to term. Explain why this pattern of secretion occurs.

Question 7. (5 minutes).

Describe the production of oxytocin and its role in human labour.

Question 8. (5 minutes).

Describe the changes that occur in the neonate's cardiovascular system after birth.

### MIDSESSION EXAMINATION, SEPTEMBER 2010

1) 25 multiple choice questions (a mixture of A to E and K-code) in 50 minutes.

2) 8 short answer questions in 40 minutes:

Question 1. (10 minutes).

Physical examination, morning blood tests and 24h urine tests taken from a 6 year old child with a history of precocious sexual development revealed the following:

	Patient level	Normal level
<u>Physical examination</u>		
Height	130 cm	95th percentile = 125 cm
Weight	33 kg	95th percentile = 27 kg
Blood pressure	150/90	~ 100/70
<u>Plasma</u>		
Cortisol	30 nmol/L	280-550 nmol/L (morning)
11-deoxycortisol	20 µg/100 mL	<0.1 µg/100 mL
ACTH	500 pg/mL	30-120 pg/mL (morning)
<u>Urine</u>		
17-ketosteroids	15-20 mg/24h	<0.5 mg/24h
Tetrahydrocompound S	1 mg/h	<0.5 mg/h

(i) What do you think is the likely diagnosis?

(ii) Briefly explain why each of the above results might be abnormal.

(iii) Why would the doctor commence treatment with cortisone?

Question 2. (10 minutes).

An 18 year old apprentice plumber, Bob, has been brought unconscious into the emergency department by his concerned boss. He says that Bob had been complaining of feeling unwell for the past few days. He had been drinking "stacks of water" and kept having to urinate. Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	Patient result	Normal result	Brief explanation



Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		
Urine flow rate	30 mL/min	0.3 – 15 mL/min	

\*\*\*\*\*The remainder of this question has not been released \*\*\*\*\*

Question 3. (5 minutes)

A 50 year old woman who is otherwise healthy, presents to her GP suffering from hot flushes.

- What changes might be occurring in this woman's hypothalamic-pituitary-ovarian axis as a result of aging?
- What effect does menopause have on bone? Explain the mechanism for this effect.

Question 4. (5 minutes).

- What is glycaemic index?
- Describe in detail how you could measure the glycaemic index of a new brand of fruit and nut muesli bars to be sold in health food shops. What ranges of values would lead you to classify the bars as low, medium or high GI?

Question 5. (5 minutes).

Describe the pathways through which testosterone and its conversion products can act. For each of these pathways give two examples of the results of these actions.

Question 6. (5 minutes).

Explain what is meant by prorenin activation, and describe the ways in which this can occur. What are the consequences of a) prorenin and b) renin binding to the (pro)renin receptor? Use diagrams to illustrate your answer if necessary.

**FINAL EXAMINATION, NOVEMBER 2010**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

Question 1. (10 minutes).

"The fetus is a miniature adult." Discuss, with reference to the cardiovascular system and at least one other body system.

Question 2. (10 minutes).

Describe the maternal changes that occur during pregnancy in

- the cardiovascular system
- the kidney and urinary system.

Question 3. (5 minutes)

Sharon and her partner David have been trying unsuccessfully to conceive for 12 months. They are both 30 years old and work in very stressful jobs.

- How could you assess whether Sharon was ovulating?
- David provided a semen sample for analysis. What would you consider to be a normal result?

Question 4. (5 minutes).

"It doesn't matter if amniotic fluid volume is abnormal." Discuss this statement and explain the causes of amniotic fluid volume abnormalities.

Question 5. (5 minutes).

Describe how the fetal response to a sustained fall in oxygen availability of more than 50% results in a cycle of events likely to end in fetal death.

Question 6. (5 minutes).

Write brief notes on how the following affect fetal breathing movements:

- i) A reduction in fetal arterial oxygen tension ( $P_{aO_2}$ ).
- ii) An increase in fetal arterial carbon dioxide tension ( $P_{aCO_2}$ ).
- iii) Fetal asphyxia (reduced  $P_{aO_2}$  **and** increased  $P_{aCO_2}$ ).

**Very briefly** comment on the effects that these three changes in blood gases would have on alveolar ventilation in an adult.

Question 7. (5 minutes).

Describe the differences between the fetal and adult adrenal glands in terms of size, regions and hormone production. Use cross sectional drawings to illustrate your answer if necessary.

Question 8. (5 minutes).

Describe two animal models of fetal programming for disease in adult life and two epidemiological studies that suggest that maternal undernutrition programs for cardiovascular disease and diabetes in adult life of the offspring.

## TIMETABLE - 2011

### PHSL3221 Endocrine, Reproductive and Developmental Physiology

Lectures: Monday 5 pm, Thursday 1 pm and Friday 1 pm (Biomed F).  
 Pracs/PBLs: Thursday 9 am -12 pm (location indicated below. **Note 329 is in the Biological Sciences Building**; Rooms G2, G4, 106, 108, 204 & LG03 are in the Wallace Wurth Building).

<b>WEEK 1</b>			
Monday 18/7	5 pm	Introduction and course information	Gibson/Boyce
Thursday 21/7	1 pm	Concepts in endocrinology	Dr K Gibson
Friday 22/7	1 pm	Body weight regulation	Dr A Sainsbury-Salis
<b>WEEK 2</b>			
Monday 25/7	5 pm	Insulin physiology	Dr E Kraegen
Thursday 28/7	9 am	PBL 1.1 (Rooms 106/108/G2/G4)	PBL tutors
Thursday 28/7	1 pm	Endocrine functions of white adipose tissue	Dr M Swarbrick
Friday 29/7	1 pm	GIT hormones and transmitters	Dr L Liu
<b>WEEK 3</b>			
Monday 1/8	5 pm	Growth	Dr K Gibson
Thursday 4/8	9 am	PBL 1.2; PBL 2.1 (Rooms 106/108/329/204)	PBL tutors
Thursday 4/8	1 pm	Diabetes and islet B cells	Dr R Laybutt
Friday 5/8	1 pm	Update on the renin angiotensin system	Dr A Boyce
<b>WEEK 4</b>			
Monday 8/8	5 pm	Discussion: Hormonal effects of water immersion	Dr K Gibson
Thursday 11/8	9 am	PBL 2.2; PBL 3.1 (Rooms 106/108/G2/G4)	PBL tutors
Thursday 11/8	1 pm	Androgens and anabolic steroids	Dr A Boyce
Friday 12/8	1 pm	Calcium metabolism	Dr K Gibson
<b>WEEK 5</b>			
Monday 15/8	5 pm	Regulation of mood: hormones & neurotransmitters	Dr B Hegarty
Thursday 18/8	9 am	PBL 3.2; PBL 4.1 (Rooms 106/108/329/204)	PBL tutors
Thursday 18/8	1 pm	Puberty	Dr K Gibson
Friday 19/8	1 pm	Hormonal contraception	Dr A Finch
<b>WEEK 6</b>			
Monday 22/8	5 pm	Menopause and andropause	Dr K Gibson
Thursday 25/8	9 am	PBL 4.2 (Rooms 106/108/G2/G4)	Dr A Boyce
Thursday 25/8	1 pm	Discussion class: Cross-dressing or crossing over?	Dr A Boyce
Friday 26/8	1 pm	Fertility and assisted reproductive technology	Dr A Clark
<b>WEEK 7</b>			
Monday 29/8	5 pm	Practice exam questions and feedback	Gibson/Boyce
Thursday 1/9	9 am	<b>Midsession Exam (Room 329 Biosciences Bldg)</b>	Dr A Boyce
Thursday 1/9	1 pm	No lecture	
Friday 2/9	1 pm	Introduction to Fetal Physiology	Dr K Gibson
<b>RECESS: 5<sup>th</sup> September – 11<sup>th</sup> September</b>			

<b>WEEK 8</b>			
Monday 12/9	5 pm	Maternal physiology	Dr K Gibson
Thursday 15/9	9am	Practical Class – Gestational diabetes and screening in pregnancy (Room 329 Biosciences)	Boyce/Gibson
Thursday 15/9	1 pm	Fetal circulation	Dr A Boyce
Friday 16/9	1 pm	Neonatal Intensive Care	Dr K Lui
<b>WEEK 9</b>			
Monday 19/9	5 pm	Fetal responses to hypoxia	Dr A Boyce
Thursday 22/9	9 am	Group 1 – neonatal nursery (10.15 am; RHW)	Dr K Gibson
		Groups 2 and 4 – Two peas in a pod (Room 329 BioSc)	Dr A Boyce
		Group 3 – presentation preparation	Self Study
Thursday 22/9	1 pm	Fetal breathing	Dr A Boyce
Friday 23/9	12 pm	<b>Endocrine assignment due</b>	<b>BBS office</b>
Friday 23/9	1 pm	Fetal endocrinology	Dr A Boyce
<b>WEEK 10</b>			
Monday 26/9	5 pm	Regulation of fetal fluids	Dr K Gibson
Thursday 29/9	9 am	Group 2 – neonatal nursery (10.15 am; RHW)	TBA
		Groups 1 and 3 – Two peas in a pod (Room 329 BioSc)	Dr K Gibson
		Group 4 - presentation preparation	Self study
Thursday 29/9	1 pm	Placenta A	Dr K Gibson
Friday 30/9	1 pm	Placenta B	Dr K Gibson
<b>WEEK 11</b>			
Monday 3/10	5 pm	No lecture – public holiday	
Thursday 6/10	9 am	Group 3 – neonatal nursery (10.15 am; RHW)	Dr K Gibson
		Groups 1,2 and 4 – presentation preparation	Self study
Thursday 6/10	1 pm	Parturition	Dr K Gibson
Friday 7/10	1 pm	Adaptation to life after birth	Dr K Gibson
<b>WEEK 12</b>			
Monday 10/10	5 pm	Imprinting film - UNSWTV	Self study
Thursday 13/10	9 am	Presentations – all students (LG03)	Gibson/Boyce
Thursday 13/10	1 pm	Lactation and early infant nutrition	Dr K Gibson
Friday 14/10	1 pm	Fetal physiology Q & A	Gibson/Boyce
<b>WEEK 13</b>			
Thursday 20/10	9 am	Epigenetics (LG03)	Prof E Lumbers
	10 am	Developmental origins of health and disease (LG03)	Prof E Lumbers