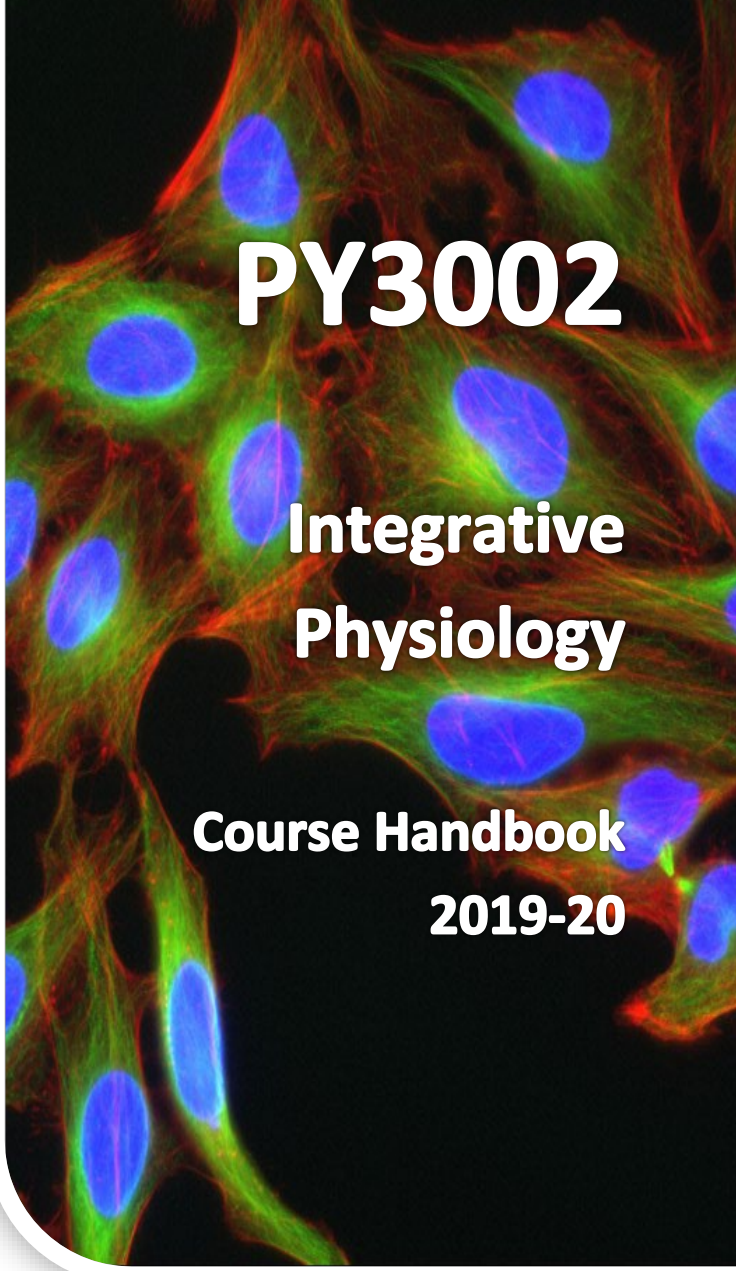
School Of Medicine, Medical Sciences & Nutrition



PY3002

Integrative Physiology

Course Handbook 2019-20

UNIVERSITY OF ABERDEEN

Contents

Cover image:

Confocal micrograph of fluorescently labelled HeLa cells.
Nuclei are labelled in blue, tubulin in green and actin fibres in red.

Courtesy of:

Kevin Mackenzie
Microscopy and Histology Core Facility
Institute of Medical Sciences
University of Aberdeen
http://www.abdn.ac.uk/ims/microscopy-histology

Course Summary

This course takes the integrative function of major organ systems as its main theme. We begin by considering how the different organ systems of the human body act in an integrative fashion and how the body copes with the challenges of maintaining homeostasis. We then focus on four specific organ systems - the cardiovascular, respiratory, gastrointestinal and renal systems. The student will learn how these systems function during health and disease, and how they interact with one another. Instruction is also provided in experimental design and measurement of cardiorespiratory variables. Lecture and case-study material is accompanied by use of the microcomputer in data capture and analysis and a problem-solving project. The course consists of 3 or 4 lectures and 1 project/laboratory session per week and is examined by continuous assessment of course work and a 3-hour written exam.

Course Co-ordinators: Professor Derek Scott (ext. 7566 d.scott@abdn.ac.uk)

Course Aims & Learning Outcomes

- To describe the interrelationships between the cardiovascular, respiratory, gastrointestinal and renal systems in the mammalian body.
- To describe the principal homeostatic mechanisms, present in the mammalian body with special attention to man.
- To introduce the importance of effective experimental design.
- To investigate how the cardiovascular, respiratory, gastrointestinal and renal systems might malfunction, and describe how these problems might impinge upon other organ systems.
- To describe the techniques used to measure the functions of the cardiovascular, respiratory, gastrointestinal and renal systems.
- To provide practical instruction in non-invasive techniques to monitor human cardio-respiratory variables, in computerised data collection and the analysis of physiological data.
- To develop transferable skills particularly in relation to information retrieval, data processing and presentation of scientific material by means of active development of teamwork, time management, communication and information technology skills.
- All lecture and tutorial material is accompanied by computer-based problem solving sessions and practical classes.

Course Teaching Staff

Course Co-ordinator(s):

Prof Derek Scott (DAS), Medical Sciences (**d.scott@abdn.ac.uk**)

Other Staff:

Prof Stephen N Davies (SND), Medical Sciences (**s.n.davies@abdn.ac.uk**)

Assessments & Examinations

Students are expected to attend all lectures, laboratory classes, and tutorials, and to complete all class exercises by stated deadlines. The minimum performance acceptable is attendance at 75% of the lectures, seminars, practical classes, and presentation of all set course work, written and oral.

Assessment is derived from course work (33%) and a written examination (67%). The continuous assessment (CA) component is based on a research project which is presented to the class as an abstract and a poster display (15%). Of this mark, the examiner awards 50% on the poster and 40% on the abstract, the final 10% is derived from peer assessment on the poster. The second continuous assessment component is case study work in weeks 16, 18 and 21 (10%). The final continuous assessment component is derived from two practical demonstrations, where students will answer question based on their laboratory work (8%).

Written Examination: 67% of the total assessment is based on one three hour written paper. The student has to answer four questions of equal weighting selected from a list of six.

Common grading scale (CGS) grade: The overall performance of the student is expressed as a grade awarded on the common spine marking scale.

The degree examination is held in December, with the re-sit examination in June.

Class Representatives

We value students' opinions in regard to enhancing the quality of teaching and its delivery; therefore in conjunction with the Students' Association we support the Class Representative system.

In the School of Medicine, Medical Sciences & Nutrition we operate a system of course representatives, who are elected from within each course. Any student registered within a course that wishes to represent a given group of students can stand for election as a class representative. You will be informed when the elections for class representative will take place.

What will it involve?
It will involve speaking to your fellow students about the course you represent. This can include any comments that they may have. You will attend a Staff-Student Liaison Committee and you should represent the views and concerns of the students within this meeting. As a representative you will also be able to contribute to the agenda. You will then feedback to the students after this meeting with any actions that are being taken.

Training
Training for class representatives will be run by the Students Association. Training will take place within each half-session. For more information about the Class, representative system visit **www.ausa.org.uk** or email the VP Education & Employability **vped@abdn.ac.uk**. Class

representatives are also eligible to undertake the STAR (Students Taking Active Roles) Award with further information about this co-curricular award being available at: **www.abdn.ac.uk/careers**.

Problems with Coursework

If students have difficulties with any part of the course that they cannot cope with, alone they should notify the course coordinator immediately. If the problem relates to the subject matter general, advice would be to contact the member of staff who is teaching that part of the course. Students with registered disabilities should contact Mrs Jenna Reynolds (**medsci@abdn.ac.uk**) in the School Office (based in the IMS, Foresterhill), or Mrs Sheila Jones (**s.jones@abdn.ac.uk**) in the Old Aberdeen office associated with the teaching laboratories, to ensure that the appropriate facilities have been made available. Otherwise, you are strongly encouraged to contact any of the following as you see appropriate:

- Course student representatives
- Course co-ordinator
- Convenor of the Medical Sciences Staff/Student Liaison Committee (Professor Gordon McEwan)
- Personal Tutor
- Medical Sciences Disabilities Co-ordinator (Dr Derryck Shewan)

All staff are based at Foresterhill and we strongly encourage the use of email or telephone the Medical Sciences Office. You may have a wasted journey travelling to Foresterhill only to find staff unavailable.

If a course has been completed and students are no longer on campus (i.e. work from second semester during the summer vacation), coursework will be kept until the end of Fresher's Week, during the new academic year. After that point, unclaimed student work will be securely destroyed.

Course Reading List

Core textbook for 3rd year General Physiology

Medical Physiology, 2nd Updated Edition. Walter F. Boron, & Emile L. Boulpaep. ISBN 978-1437717532. Saunders (2012).

Cardiovascular Physiology textbooks

- Levick, J. R., 2003. An introduction to cardiovascular physiology (4th Ed.) London: Arnold.
- Berne, R.M. & Levy, M.N., 2001. Cardiovascular physiology (8th Ed.) London: Mosby.
- Noble, A. *et al*., 2005. The cardiovascular system – Systems of the body series. Edinburgh: Churchill-Livingstone.

Respiratory Physiology textbooks

- Davies, A. & Moores, C., 2003. The respiratory system – Systems of the body series. Edinburgh: Churchill-Livingstone.
- Widdicombe, J., 1993. – Respiratory Physiology - Physiological Principles in Medicine Series. London: Arnold.
- West, J., 2004. Respiratory Physiology. London: Lippincott Williams & Wilkins.

Renal Physiology textbooks

- Field, M.J, Pollock, C.A. & Harris, D.C., 2001. The renal system – Systems of the body series. Edinburgh: Churchill-Livingstone.
- Koeppen, B.M. & Stanton, B.A., 2001. Renal physiology. London: Mosby.

There are a range of new titles available from the library focusing on cardiovascular, renal and respiratory physiology. Material for the gastrointestinal lectures will be provided by Dr Scott. Whilst most of these are held in the Medical School library at Foresterhill, they can be delivered to Sir Duncan Rice Library for your convenience. If there is an updated version of these texts, please feel free to use it instead.

Lecture Synopsis

Lecture 1: Registration & Introduction to the Course – Prof Derek Scott

Introduction to the scope and content of the course. Explanation of projects, practical work, case studies and assessment.

Lectures 2 & 3: Applied Integrative Physiology I & II – Arterial Blood Gas Analysis and Life Support – Prof Derek Scott

These two lectures will consider how a basic understanding of blood chemistry and gas values can tell us about health, disease and exercise ability. We will also discuss how much of the science you already know is at the core of cardiopulmonary resuscitation, life support and advanced medical practice.

Lecture 4 & 5: Principles of Cardiovascular Measurement– Prof Stephen Davies

These two lectures will consider the methods with which the activity of the cardiovascular system can be investigated, both experimental and clinically. Measurement of heart volumes. Measurement of blood pressure. Measurement of blood velocity and flow. Practical examples of the above.

Lecture 6: Cardiovascular Pathophysiology I – Prof Derek Scott

The A-Z of cardiovascular pathophysiology. A knowledge of normal cardiac structure and function is crucial to understanding to understanding diseases that affect the heart. From your basic knowledge, you will be invited to postulate what malfunctions may arise in the cardiovascular system. We will compare this with a systematic analysis of cardiovascular pathophysiology.

Lecture 7: Cardiovascular Pathophysiology II - Prof Derek Scott

Acute coronary syndromes - In the USA alone, more than 1.6 million people each year are admitted to hospital suffering from acute heart attacks. We will define what is meant by an acute cardiac event and explore the physiological mechanisms involved.

Lecture 8: Cardiovascular Pathophysiology III - Prof Derek Scott

Chronic coronary conditions - Heart failure may be the final, and most severe manifestation of nearly every form of cardiac disease, and is the most common diagnosis of hospital patients aged over 65. Heart failure most commonly results from impairments of left ventricular function. We will explore the underlying mechanisms using basic physiological principles.

Lecture 9: Background to ECG's - Prof Derek Scott

A gentle introduction to the principles of measuring and recording electrocardiograms. Explanation of different types of ECG and what they can and cannot tell us about the health of a subject.

Lecture 10: Cardiovascular Case Study – Prof Derek Scott

During this session, you will complete questions based upon the case study that you will have been given the week before. The questions will be completed individually, under exam conditions, and the marks for this exercise will form part of your continuous assessment.

Lecture 11: Principles of Gastrointestinal Measurement I – Prof Derek Scott

Basic introduction to methods of investigating the structure and function of the various components of the gastrointestinal tract. Uses of endoscopy and imaging techniques. Use of biopsy and basic examination techniques such as palpation, auscultation, percussion etc. Common disease states which can be identified using these techniques. Laboratory/research methods for investigating GI function.

Lecture 12: Principles of Gastrointestinal Measurement II – Prof Derek Scott

Introduction to liver function tests. Reasons for testing liver/biliary enzyme activities. Stool sampling (faecal occult blood tests, microbiology, chemical testing). Indications of nutritional problems. Bowel cancer screening programmes.

Lecture 13: Neural Control of Ventilation – Prof Derek Scott

This lecture will consider the nervous aspects of how we control respiration. We will consider how the nervous system helps to control normal respiration and how it adapts to cope with unusual respiratory situations. Topics which will be reviewed will include: generation of respiratory rhythm, patterns of breathing during disease, respiratory centres of the brain, conscious control of breathing, innervation of respiratory muscles, vagal reflexes and respiration during unusual situations (i.e. swallowing, coughing).

Lecture 14: Materno-Foetal Physiology – Integration of the Respiratory and Cardiovascular Systems – Prof Derek Scott

This lecture will consider the special changes and adaptations that occur during pregnancy and soon after birth in both mother and child. Materno-foetal physiology is one example of physiological integration - the respiratory and cardiovascular systems of the parent and foetus must develop and function together to ensure the proper development and safe delivery of the child, whilst minimising any detrimental effects that pregnancy might have on the mother. We will consider the role of the placenta and review the pulmonary and cardiovascular changes that occur in the foetus and neonate.

Lecture 15: Respiratory Pathophysiology – Prof Derek Scott

Many of us take respiration for granted, but malfunctions in any part of the respiratory system can produce severe and distressing effects which may involve or affect other physiological systems. This lecture will briefly review some of the disease states which affect the respiratory system. This will form a foundation for further lectures which students will attend in other specialist courses in their chosen degree disciplines. The disease states considered will include: asthma, chronic obstructive pulmonary disease (COPD), pneumothorax, pulmonary embolism, pulmonary hypertension, respiratory failure and acute respiratory distress syndrome.

Lecture 16: Principles of Respiratory Measurement I – Prof Derek Scott

Lung function tests and what they mean. Spirometry and flow volume curves. Lung volumes. Diffusing capacity. Blood gases. Exercise tests.

Lecture 17: Principles of Respiratory Measurement II – Prof Derek Scott

Bronchial provocation tests. The new IOC rules for asthma testing in athletes. How it works. Recent British outcomes.

Lecture 18: Respiratory Case Study – Prof Derek Scott

During this session, you will complete questions based upon the case study that you will have been given the week before. The questions will be completed individually, under exam conditions, and the marks for this exercise will form part of your continuous assessment.

Lecture 19: Gastrointestinal Pathophysiology I – Prof Derek Scott

Examples of gallbladder and pancreatic disease. Gallstones and jaundice. Pancreatitis.

Lecture 20: Gastrointestinal Pathophysiology II – Prof Derek Scott

Examples of hepatic disease. Liver failure. Portal hypertension. Cirrhosis.

Lecture 21: Gastrointestinal Pathophysiology III – Prof Derek Scott

Inflammatory bowel disease. Definitions and symptoms. Comparisons with irritable bowel syndrome and diarrhoeal disease states. Extraintestinal manifestations. Therapeutic options. The ileo-anal pouch/reservoir.

Lecture 22: Principles of Renal Measurement I – Prof Derek Scott

Measurement of renal clearance and transport. Evaluation of ability of the kidneys to handle solutes and water. Use of inulin and p-aminohippurate to assess glomerular filtration rate or renal plasma flow. Microscopic techniques (e.g. micropuncture/microperfusion) used to measure single nephron rates of filtration, absorption and secretion.

Lecture 23: Principles of Renal Measurement II – Prof Derek Scott

Modern imaging techniques used to view renal blood flow, filtration and excretion. Radionuclide scanning to assess renal perfusion and computerised tomography (CT) to look for structural abnormalities of urinary tract. Ultrasonography to measure kidney size, obstructions and malformations. Biochemical testing of blood and urine for signs of renal malfunction (e.g. pH, osmolality, blood in urine, pCO_2, HCO_3^-).

Lecture 24: Renal Pathophysiology I – Dr Michael Scholz

Brief consideration of what parts of the renal system may malfunction during disease. Hypertension and the kidney. Determinants of normal blood pressure and the role of the kidney. Pathogenesis of essential hypertension. Pathology of hypertension. Physiological targets in the management of hypertension. Secondary hypertension.

Lecture 25: Renal Pathophysiology II – Dr Michael Scholz

Chronic renal failure. Links with diabetic nephropathy. Common causes of chronic renal failure. Presentation and natural history of chronic renal failure. The progressive nature of chronic renal failure. Main consequences of renal failure and their pathogenesis. Possible physiological targets for treatment of chronic renal failure.

Lecture 26: Renal Pathophysiology III – Dr Michael Scholz

Urinary tract obstructions and stones. Principal causes of haematuria. Pathophysiology and complications of urinary tract obstructions. Investigation and principles of treatment of urinary tract obstruction. Description of common types of urinary tract stones and outline of their forms of presentation and management.

Lecture 27: Renal/Gastrointestinal Case Study – Prof Derek Scott

During this session, you will complete questions based upon the case study that you will have been given the week before. The questions will be completed individually, under exam conditions, and the marks for this exercise will form part of your continuous assessment.

Lecture 28: Final Review of the Course, Exam Information & Course Evaluation

An overview of how all of the organ systems we have focused on all link together, and how they can profoundly affect one another. What are the take home messages of this course? Information regarding the examination. Completion of course evaluation forms.

Practical/Lab/Tutorial Work

Tutorial Work

Tutorial work will take the form of three case studies, which will be handed out throughout the course. There will be one based on a clinical problem involving each of the major organ systems covered in the course – cardiovascular, respiratory and gastrointestinal/renal. Students will be issued with the case details the week before the actual exercise so that they have a chance to find out more about the topic. On the day of the case study, they will have 45-50 minutes to answer approximately 10 questions based upon the case study. At the end of this period, each student's answers will be submitted to the lecturer for marking. The marks for these case studies will form part of your continuous assessment (10%).

Laboratory Work

The laboratory work on this course falls into two categories: a research project and two separate practical activities

The research project is a student led, team-based research project that incorporates a wide range of transferable skills. The essence of the project is to allow students to develop a research project that helps them to communicate science to a broad audience, and thus to develop their understanding of the discipline by thinking about how they can best take complex scientific information and present it in an accessible manner. As well as producing a poster that will be linked to a class Twitter account, students will each produce an individual short scientific abstract. The written reports and the poster presentation will each form an important component of the continuous assessment.

During the course, there will be two practicals lasting for a large portion of the day: one focusing on measurement of the ECG, and a second on respiratory function. The morning will involve a brief demonstration and explanation of the experimental apparatus and data interpretation. Students will be given the chance to perform the measurements on themselves and will then have to answer a short set of questions based upon the day's work. These answers are then submitted for marking online at the end of the practical class, using a system known as Lab Tutor, and form part of the continuous assessment mark (8%).

Please read the student notes concerned with behaviour and safety in the laboratories.

The practical work required in this course may present difficulties to students with special educational needs. For such students, alternative arrangements will be made. Any student with special needs should make these known to the Course Co-ordinator when registering for the class and should then also discuss their needs with the School Disabilities Co-ordinator, to ensure that they have the best possible outcome.

University Policies

Students are asked to make themselves familiar with the information on key institutional policies which been made available within MyAberdeen (**https://abdn.blackboard.com/bbcswebdav/institution/Policies**). These policies are relevant to all students and will be useful to you throughout your studies. They contain important information and address issues such as what to do if you are absent, how to raise an appeal or a complaint and indicate how seriously the University takes your feedback.

These institutional policies should be read in conjunction with this programme and/or course handbook, in which School and College specific policies are detailed. Further information can be found on the **University[1]s Infohub webpage** or by visiting the Infohub.

The information included in the institutional area for 2019/20 includes the following:

- Absence
- Appeals & Complaints
- Student Discipline
- Class Certificates
- MyAberdeen
- Originality Checking
- Feedback
- Communication
- Graduate Attributes
- The Co-Curriculum

Medical Sciences Common Grading Scale

Grade	Grade Point	Category	Honours Class	Description
A1	22	Excellent	First	• Outstanding ability and critical thought • Evidence of extensive reading • Superior understanding • The best performance that can be expected from a student at this level
A2	21			
A3	20			
A4	19			
A5	18			
B1	17	Very Good	Upper Second	• Able to argue logically and organise answers well • Shows a thorough grasp of concepts • Good use of examples to illustrate points and justify arguments • Evidence of reading and wide appreciation of subject
B2	16			
B3	15			
C1	14	Good	Lower Second	• Repetition of lecture notes without evidence of further appreciation of subject • Lacking illustrative examples and originality • Basic level of understanding
C2	13			
C3	12			
D1	11	Pass	Third	• Limited ability to argue logically and organise answers • Failure to develop or illustrate points • The minimum level of performance required for a student to be awarded a pass
D2	10			
D3	9			
E1	8	Fail	Fail	• Weak presentation • Tendency to irrelevance • Some attempt at an answer but seriously lacking in content and/or ability to organise thoughts
E2	7			
E3	6			
F1	5	Clear Fail	Not used for Honours	• Contains major errors or misconceptions • Poor presentation
F2	4			
F3	3			
G1	2	Clear Fail/ Abysmal	-	• Token or no submission
G2	1			
G3	0			

Course Timetable PY3002: 2019-2020

Date	Time	Place	Subject	Session	Staff
Week 7					
Mon 9 Sep	14:00-15:00	MT2	Registration & Introduction to the Course	Lecture	DAS
	16:00-17:00	FN3	Applied Integrative Physiology I	Lecture	DAS
Tue 10 Sep	10:00-13:00	ZB06/ZB11	Introduction to research project – assign research topics	Practical	DAS
Wed 11 Sep					
Thu 12 Sep					
Fri 13 Sep	14:00-15:00	NK14	Principles of CV Measurement I	Lecture	SND
	15:00-16:00	NK14	Principles of CV Measurement II	Lecture	SND
Week 8					
Mon 16 Sep	14:00-15:00	MT2	Applied Integrative Physiology II	Lecture	DAS
	16:00-17:00	FN3	CV Pathophysiology I	Lecture	DAS
Tue 17 Sep	10:00-13:00	ZB06/ZB11	Research Project – research topic talks	Practical	DAS
Wed 18 Sep					
Thu 19 Sep					
Fri 20 Sep					
Week 9					
Mon 23 Sep	14:00-15:00	MT2	CV Pathophysiology II	Lecture	DAS
	16:00-17:00	FN3	Private Study	Study	
Tue 24 Sep	10:00-13:00	ZB06/ZB11	Research Project – intro to case studies and literature searching	Practical	DAS
Wed 25 Sep					
Thu 26 Sep					
Fri 27 Sep	14:00-15:00	NK14	CV Pathophysiology III	Lecture	DAS
	15:00-16:00	NK14	HAND OUT CASE STUDY	Lecture	DAS
Week 10					
Mon 30 Sep	14:00-15:00	MT2	Background to ECG's	Lecture	DAS
	16:00-17:00	FN3	Principles of GI measurement 1	Lecture	DAS
Tue 1 Oct					
Wed 2 Oct					
Thu 3 Oct					
Fri 4 Oct	14:00-15:00	NK14	CV Case Study - ASSESSMENT	Assessment	DAS
Week 11					
Mon 7 Oct	14:00-15:00	MT2	Principles of GI Measurement 2	Lecture	DAS
	16:00-17:00	FN3	Private Study	Study	
Tue 8 Oct					
Wed 9 Oct					
Thu 10 Oct					
Fri 11 Oct	16:00-17:00	NK14	Materno-Foetal Physiology	Lecture	DAS
Week 12					
Mon 14 Oct	14:00-15:00	MT2	Neural Control of Ventilation	Lecture	DAS
	16:00-17:00	FN3	Respiratory Pathophysiology	Lecture	DAS
Tue 15 Oct	10:00-17:00	ZB06/ZB11	ECG Practical	Practical	DAS
			HAND OUT CASE STUDY		
Wed 16 Oct					

Thu 17 Oct					
Fri 18 Oct	14:00-15:00	NK14	Principles of Respiratory Measurement I	Lecture	DAS
	16:00-17:00	NK14	Private Study	Study	
Week 13					
Mon 21 Oct	14:00-15:00	MT2	Principles of Respiratory Measurement II	Lecture	DAS
	16:00-17:00	FN3	Private Study	Study	DAS
Tue 22 Oct	10:00-17:00	ZB06/ZB11	Respiratory Practical	Practical	DAS
Wed 23 Oct					
Thu 24 Oct					
Fri 25 Oct	14:00-15:00	NK14	Respiratory Case Study - ASSESSMENT	Assessment	DAS
	16:00-17:00	NK14	GI Pathophysiology I	Lecture	DAS
Week 14					
Mon 28 Oct	14:00-15:00	MT2	GI Pathophysiology II	Lecture	DAS
	16:00-17:00	FN3	GI Pathophysiology III	Lecture	DAS
Tue 29 Oct	10:00-13:00	ZB06/ZB11	Research Project	Practical	DAS
			Case Study – General Feedback & Answers		
Wed 30 Oct					
Thu 31 Oct					
Fri 1 Nov	11:00-12:00	NK1	Principles of Renal Measurement I	Lecture	DAS
Week 15					
Mon 4 Nov	14:00-15:00	MT2	Principles of Renal Measurement II	Lecture	DAS
	16:00-17:00	FN3	Private Study	Study	
Tue 5 Nov	10:00-13:00	ZB06/ZB11	Research Project	Practical	DAS
			HAND OUT CASE STUDY		
Wed 6 Nov					
Thu 7 Nov					
Fri 8 Nov	14:00-15:00	NK14	Renal Pathophysiology I	Lecture	MES
	15:00-16:00	NK14	Renal Pathophysiology II	Lecture	MES
Week 16					
Mon 11 Nov	14:00-15:00	MT2	Renal Pathophysiology III	Lecture	MES
	16:00-17:00	FN3	Renal/GI Case Study - ASSESSMENT	Assessment	DAS
Tue 12 Nov	10:00-13:00	ZB06/ZB11	Research Project - Submit final poster file	Lecture	DAS
Wed 13 Nov					
Thu 14 Nov					
Fri 15 Nov	11:00-12:00	NK1	GI Pathophysiology IV	Lecture	DAS
Week 17					
Mon 18 Nov	14:00-17:00	ZB06	Poster Preparation	Practical	DAS
Tue 19 Nov	10:00-13:00	ZB06/ZB11	Poster marking/Group marking	Presentation	DAS
	14:00-16:00	IMS Atrium	Poster Presentations	Presentation	All staff
Wed 20 Nov					
Thu 21 Nov					
Fri 22 Nov	14:00-15:00	NK14	Exam info/feedback	Revision Session	DAS
			Project abstract - final version deadline!		
Week 18 - No teaching during this week REVISION WEEK					
Mon 25 Nov			Revision activities will be scheduled in this week if requested by students – Dr Scott will ask the class		

			what they want and need and arrange sessions accordingly.		
Tue 26 Nov					
Wed 27 Nov					
Thu 28 Nov					
Fri 29 Nov					

Staff

Prof Derek Scott (DAS)
Prof Stephen Davies (SND)
Dr Michael Scholz (MES)

Venues

NK14 – New King's Building, Old Aberdeen
G08 – Cruickshank Building, within Botanic Gardens, near the greenhouses
KCG08 – King's College Quad, Ground Floor, Room 8, in the oldest part of the University
Zoology Lab ZB06/11 – Physiology Laboratory, Basement of the Zoology Building, Old Aberdeen
IMS Atrium – Institute of Medical Sciences, Medical School Campus, Foresterhill