

Course Outline - MDSC 404 Integrative Human Physiology

Course Coordinator – Dr. James Fewell (fewell@ucalgary.ca)

Instructors:

- Neurophysiology, Cardiovascular & Respiratory
Dr. James Fewell (fewell@ucalgary.ca)
- Endocrine & Renal
Dr. Francine Smith (fsmith@ucalgary.ca)
- Gastrointestinal & Liver
Dr. Donna-Marie McCafferty (dmmccaff@ucalgary.ca)

Office Hours/Policy on Answering Student Emails:

- Office hours will be set and communicated by individual instructors.
- Emails from student's@ucalgary.ca account will be answered Monday to Friday from 0800 to 1600 within 48 hours of receipt; questions regarding unit material will not be answered within 24 hours of a unit examination.

Teaching Assistant:

- To be determined

Time and Location:

- Lectures will be held Monday, Wednesday, and Friday from 1510 to 1600 in Theatre 1, Health Sciences Centre. **Please Note:** Lecturer and teaching assistant will be available after lecture from 1600 to 1650 to answer questions regarding lecture/course material.

Important Dates:

Fall Term

- First day of class: Wednesday, September 7th
- National Day for Truth and Reconciliation: Friday, September 30th, no class
- Thanksgiving Day: Monday, October 10th, no class
- Fall term Break (includes Remembrance Day): Sunday-Saturday, November 6th-12th, no classes
- Last day of class: Wednesday, December 7th

Winter Term

- First day of class: Monday, January 9th
- Winter term break (includes Alberta Family Day): Sunday-Saturday February 19th-25th, no classes
- Good Friday: April 7th, no class
- Easter Monday: April 10th, no class
- Last day of class: Wednesday, April 12th

Prerequisite:

- Enrolment in the BHSc Honours program or consent of course coordinator.

Course Description:

- Physiology is defined as the study of how living organisms function and encompasses the integration of processes from molecules to the whole-organism. MDSC 404 provides fundamental principles and concepts about the physiology of major human organ systems.

Overarching Theme:

- Course format consists of face-to-face lectures provided by published scholars as well as student-initiated discussions of various topics.

Global Objective:

- The global objective of MDSC 404 is to provide a grounding in integrative human physiology.

Course Learning Outcomes:

- By the end of this course, students will have a founding in integrative human physiology that will allow them: a) to recall fundamental principles and concepts regarding physiology of the nervous system, endocrine system, cardiovascular system, respiratory system, renal system and gastrointestinal system, b) to apply these physiological principles and concepts to predict the body's response to perturbations that disrupt homeostasis, and c) to predict how disease or injury of an organ can lead to disordered function (i.e., pathophysiology) and disrupt homeostasis.

Transferable Skill Development:

Many of the skills and abilities that you are developing in your coursework are transferable to the workforce, graduate and professional studies and other facets of life. Employers seek applicants with transferable skills because they can be an asset in the workplace, regardless of industry or sector. Transferable skills are core skills for your success in building your future career.

The work that you will do in MDSC 404 will help you build the following transferable skills:

- **Collaboration:** Work respectfully with others from different backgrounds, cultures, and countries.

- **Verbal Communication:** Learn and share information by presenting, listening, and interacting with others.
- **Creativity and Innovation:** Find different and better ways to do things, being curious, thinking imaginatively.
- **Critical Thinking:** Actively and skillfully conceptualize, apply, analyze, synthesize, and/or evaluate information (data, facts, observable phenomena, and research findings) to make a reasoned judgement or draw a reasonable conclusion.
- **Digital Skills:** Use digital technologies like computers, social media, virtual meeting platforms, and the internet.
- **Information Literacy:** Find, understand, and use information presented through words, symbols, and images
- **Numeracy:** Use mathematical information such as numbers, symbols, words, and graphics to do tasks.
- **Problem solving:** Identify an issue, find and implement a solution, and assess whether the situation has improved.
- **Project Management:** Conceptualize, initiate, plan and execute a plan to achieve a predetermined goal (project) by effectively prioritizing activities and meeting deadlines.
- **Written Communication:** Share ideas and information by using words, images, and symbols.

Required Textbook

- Derrickson's Human Physiology, 2rd edition, John Wiley and Sons, 2019.

A Note regarding readings

- A list of required readings for all course units will be outlined on D2L and links and documents will be made available, where appropriate. Required readings have been chosen carefully to inform you and enhance the lecture material. **Students are REQUIRED to complete assigned readings BEFORE each lecture.** Instructors will proceed in class on the assumption that students have read completely the assigned readings.
- Students should be aware that many of the readings they will be assigned might be of an unfamiliar nature and style. Students should allot sufficient time to allow for several reads of the assigned material.

Learning Technology Requirements

Brightspace (by D2L) is located on the University of Calgary server and will be used extensively for communication with students. **It is the student's responsibility to ensure that they receive all posted communications and documents and that they receive emails sent by instructors or fellow students through D2L.** Only your @ucalgary.ca email address may be linked to D2L. Please ensure that you are regularly checking your @ucalgary.ca account.

Evaluation

- The Undergraduate Grading System University policy is described in section F.1.1. of the 2022-2023 University of Calgary Calendar.

- In determining the overall grade in MDSC 404, the following weights will be used:
 - Six unit examinations, three each term, will make-up 80% of your final grade.
 - Two expository essays, one each term, will make-up 20% of your final grade.

The six unit examinations, will be recorded on a percentage basis and used to determine your unit examinations mark after your lowest unit examination mark is dropped. You are required to write all six unit examinations. The mark on the last unit examination (i.e., GI & Liver) must be within 2 standard deviations of the mean of the previous five unit examinations in order for it to be dropped. Scheduled unit examinations will consist of multiple choice, true-false, and fill-in-the-blank questions as well as short answer and/or problem-solving questions.

Unit examinations will cover lecture material and assigned readings.

- All examinations will be closed-book but a nonprogrammable calculator may be used.
- A passing grade on any examination is not essential to pass MDSC 404.
- Students in MDSC 404 are not expected to participate as subjects in research projects of professors involved in the course.

Topics for expository essays will be provided in the first week of each term. An expository essay requires exploration of a particular subject and presentation of your findings in a well-structured and objective argument; in this type of essay, you basically study a topic or problem and “expose” what you have learned. Typically, the layout of this essay uses a traditional 5-paragraph structure (e.g., Introduction which contains general information, provides context and ends with a thesis statement; Main body that consists of 3 (or more) paragraphs that focus on particular ideas and/or material; and a Conclusion in which the thesis statement is revisited and conclusions are drawn from the information provided in the body of the essay).

The expository essays will require that you use the fundamental physiological principles and concepts learned in didactic sessions and assigned readings complemented by review of the scientific literature to predict the body’s response to selected perturbations that disrupt homeostasis, and/or to predict how a given disease or injury can lead to disordered function (i.e., pathophysiology) that disrupts homeostasis.

The essays will be due during the penultimate week of the term (i.e., Friday, December 2nd & Wednesday, April 5 since Friday, April 7 is Good Friday). ***Extensions will NOT be granted for dates of submission of essays.*** The topics of the first expository essay will be aligned with neurophysiology, cardiovascular physiology and respiratory physiology content presented during the first term; the topics of the second expository essay will be aligned with renal physiology, endocrine physiology and GI physiology content presented during the second term. You will be asked to choose one of three potential topic options each term for your essay.

A Note regarding Writing Assignments:

Writing skills are important to academic study in all disciplines. In keeping with the University of Calgary’s emphasis on the importance of academic writing in student assignments (section E.2 of 2022-23 Calendar), writing is emphasized, and the grading thereof in determining a student’s mark in this course. The Bachelor of Health Sciences values excellence in writing. Competence in

writing entails skills in crafting logical, clear, coherent, non-redundant sentences, paragraphs and broader arguments, as well as skills with the mechanics of writing (grammar, spelling, punctuation). Sources used in research papers must be properly documented. The University of Calgary offers instructional services through the Students' Success Centre's Writing Support Services (<http://www.ucalgary.ca/writingsupport/>) for students seeking feedback on assignments or seeking to improve their general writing skills. Students are **strongly encouraged** to take advantage of these programs.

Grading Scheme:

Letter Grade	Description	Percentage
A+	Outstanding performance	96-100
A	Excellent performance	90-95.99
A-	Approaching excellent performance	85-89
B+	Exceeding good performance	80-84
B	Good performance	75-79
B-	Approaching good performance	70-74
C+	Exceeding satisfactory performance	65-69
C	Satisfactory performance	60-64
C-	Approaching satisfactory performance	57-59
D+	Marginal pass	54-56
D	Minimal pass	50-53
F	Does not meet course requirements	0-49

Missed Components of Term Work:

Extensions will NOT be granted for dates of submission of essays.

Deferred examinations are allowed only in the following circumstances: debilitating illness, severe domestic affliction, religious conviction, religious observance or absence due to a Faculty-approved activity. If you wish to defer an examination, you must contact the unit lead BEFORE the time of the scheduled examination. The makeup examination will usually be scheduled and administered within 7 days of the missed scheduled examination and will be different from the original examination. If a student misses a scheduled examination, they are upon their honour code not to discuss the missed examination with their fellow students before taking the deferred examination.

Deferred examinations will not be granted if a student:

- Misses an exam without just cause.
- Personal scheduling conflicts (e.g., travel).
- Misreads the exam schedule.
- Submits an exam for marking.

Course Evaluations and Student Feedback

Student feedback will be sought at the end of the course through the Universal Student Rating of Instruction (USRI) and a qualitative student evaluation. Students are welcome to discuss the process and content of the course at any time with the instructor. Students may also address any concerns they may have with Dr. Ebba Kurz, Associate Dean (Undergraduate Health and Science Education) in the Cumming School of Medicine (kurz@ucalgary.ca).

Attendance

Regular attendance is encouraged for students in MDSC 404.

Conduct During Lectures

The classroom should be respected as a safe place to share ideas without judgement - a community in which we can all learn from one another. Students are expected to frame their comments and questions to lecturers in respectful and appropriate language, always maintaining sensitivity towards the topic. Students, employees, and academic staff are also expected to demonstrate behaviour in class that promotes and maintains a positive and productive learning environment.

As members of the University community, students, employees and academic staff are expected to demonstrate conduct that is consistent with the University of Calgary Calendar, the Code of Conduct and Non-Academic Misconduct policy and procedures, which can be found at <https://www.ucalgary.ca/legal-services/university-policies-procedures>.

Students are expected to take notes during class and should not rely solely on material supplied by the instructors.

Use of Internet and Electronic Communication Devices in Class

The Bachelor of Health Sciences program aims to create a supportive and respectful learning environment for all students. The use of laptop and mobile devices is acceptable when used in a manner appropriate to the course and classroom activities. However, research studies have found that inappropriate/off-topic use of electronic devices in the classroom negatively affects the learning of others during class time.

Students are responsible for being aware of the University's Internet and email use policy, which can be found at <https://www.ucalgary.ca/policies/files/policies/electronic-communications-policy.pdf>.

UNIVERSITY OF CALGARY POLICIES AND SUPPORTS

Copyright

All students are required to reach the University of Calgary policy on Acceptable Use of Material Protected by Copyright (<https://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright-policy.pdf>) and requirements of the Copyright Act

(<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks, etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy <https://www.ucalgary.ca/pubs/calendar/current/k.html>.

Instructor Intellectual Property

Course materials created by instructors (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may **NOT** be reproduced, redistributed or copied without the explicit consent of the professor. **The posting of course materials to third party websites such as note-sharing sites without permission is prohibited.** Sharing of extracts of these course materials with other students enrolled in the course **at the same time** may be allowed under fair dealing.

Academic Accommodations

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The Student Accommodations policy is available at <https://ucalgary.ca/student-services/access/prospective-students/academic-accommodations>. Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the Procedure for Accommodations for Students with Disabilities (<https://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities.pdf>). SAS will process the request and issue letters of accommodations to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/.

Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to Dr. Ebba Kurz (kurz@ucalgary.ca), Associate Dean (Undergraduate Health and Science Education).

Academic Misconduct

The University of Calgary is committed to the highest standards of academic integrity and honesty. The University of Calgary has created rules to govern all its members regarding the creation of knowledge and the demonstration of knowledge having been learned.

Academic Misconduct refers to student behaviour that compromises proper assessment of a student's academic activities and includes (but is not limited to): cheating, fabrication, falsification, plagiarism, unauthorized assistance, failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses, and failure to comply with exam regulations applied by the Registrar. **It also includes using of third party websites/services to access past/current course material, essay/assignment writing services, or real-time assistance in completing assessments, seeking answers to assessment questions and similar, whether paid, bartered or unpaid.**

For information of the Student Academic Misconduct Policy and Procedures, please visit; <https://ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf>

<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-procedure.pdf>

Additional information is available on the Academic Integrity website at: <https://ucalgary.ca/student-services/student-success/learning/academic-integrity>.

Recording of Lectures

Audio or video recording of lectures (or similar) is prohibited except where explicit permission has been received from the instructor.

Freedom of Information and Protection of Privacy Act

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

Appeals

If there is a concern with the course, academic matter or a grade, first communicate with the instructor. If these concerns cannot be resolved, students can proceed with an academic appeal, as per Section I of the University Calendar. Students must follow the official reappraisal/appeal process and may contact the Student Ombuds' Office (<http://www.ucalgary.ca/ombuds>) for assistance with this and with any other academic concerns, including academic and non-academic misconduct. Students should be aware that concerns about graded term work may only be initiated **within 10 business days** of first being notified of the grade. <https://www.ucalgary.ca/pubs/calendar/current/i-2.html>

Sexual and Gender-Based Violence Policy

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the policy available at <https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>

Resources for Support of Student Learning, Success, Safety and Wellness

Student Success Centre - <http://www.ucalgary.ca/ssc/>

Student Wellness Centre - <http://www.ucalgary.ca/wellnesscentre/>

Student Advocacy and Wellness Hub (CSM students)

<https://cumming.ucalgary.ca/student-advocacy-wellness-hub/home>

Distress Centre - <http://www.distresscentre.com/>

Library Resources - <http://library.ucalgary.ca>

Wellness and Mental Health Resources

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness, and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the excellent mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (<https://www.ucalgary.ca/wellnesscentre/services/mental-health-services>) and the Campus Mental Health Strategy (<http://www.ucalgary.ca/mentalhealth/>).

Student Ombuds' Office

The Student Ombuds' Office supports and provides a safe, neutral space for students. For more information, please visit www.ucalgary.ca/ombuds/ or email ombuds@ucalgary.ca

BHSc Student Faculty Liaison Committee (SFLC)

The BHSc SFLC, with elected representatives from all majors, serves to raise issues of interest to BHSc students to the program administration, including items pertaining to curriculum, scheduling and events. A list of current representatives can be found on the BHSc website.

Student Union (SU) Information

The SU Vice-President Academic can be reached at (403) 220-3911 or suvpaca@ucalgary.ca; the SU representatives for the Cumming School of Medicine can be reached at medrep1@su.ucalgary.ca or medrep2@su.ucalgary.ca.

Student Success Centre

The Student Success Centre provides services and programs to ensure students can make the most of their time at the University of Calgary. Our advisors, learning support staff, and writing support staff assist students in enhancing their skills and achieving their academic goals. They provide tailored learning support and advising programs, as well as one-on-one services, free of charge to all undergraduate and graduate students. For more information visit: <https://www.ucalgary.ca/student-services/student-success>

Emergency Evacuation/Assembly Points

As part of the University of Calgary Emergency Evacuation plan, students, faculty, and staff should locate the closest Assembly Point in case of Fire Alarm. Safety signage is posted throughout the campus showing the locations and the possible route to these locations. All students, faculty, and staff are expected to promptly make their way to the nearest Assembly Point if the Fire Alarm is activated. No one is to return into campus facilities until an all clear is given to the warden in charge of the Assembly Area. For more information, see <https://www.ucalgary.ca/emergencyplan/building-evacuation/assembly-points>

Safewalk

Campus security will escort individuals, day or night, anywhere on campus (including McMahon Stadium, Health Sciences Centre, Student Family Housing, the Alberta Children's Hospital and the University LRT station). Call 403-220-5333 or visit <http://www.ucalgary.ca/security/safewalk>. Use

any campus phone, emergency phone or the yellow phone located at most parking lot pay booths. Please ensure your personal safety by taking advantage of this service.

Class Examination Schedule

Unit	Unit Lead	Readings	Examination Date
Neurophysiology	Dr. Fewell	TBA	Wednesday - October 5
Cardiovascular	Dr. Fewell	TBA	Friday – November 4
Respiratory	Dr. Fewell	TBA	Wednesday – December 7
Endocrine	Dr. Smith	TBA	Friday – February 3
Renal	Dr. Smith	TBA	Friday – March 10
GI & Liver	Dr. McCafferty	TBA	Wednesday – April 5

Class Lecture Schedule – 2022 Fall Term

#	Unit	Date	Lecture	Faculty
1	Introduction	W 7 Sept	Intro to MDSC 404 / Davison Award / Homeostasis & rheostasis	Dr. J. Fewell
2	Neuro-1	F 9 Sept	Organization of the nervous system	Dr. J. Fewell
3	Neuro-2	M 12 Sept	Electrical signals – biopotentials, membrane excitability & action potentials	Dr. J. Fewell
4	Neuro-3	W 14 Sept	Transmitters, receptors and synaptic mechanisms	Dr. J. Fewell
5	Neuro-4	F 16 Sept	Central nervous system & sleep	Dr. J. Fewell
6	Neuro-5	M 19 Sept	Peripheral nervous system – afferent: Somatosensory system	Dr. F. Smith
7	Neuro-6	W 21 Sept	Peripheral nervous system – afferent: Special senses I	Dr. F. Smith
8	Neuro-7	F 23 Sept	Peripheral nervous system – afferent: Special senses II	Dr. F. Smith
9	Neuro-8	M 26 Sept	Peripheral nervous system – efferent: Somatomotor nervous system & skeletal muscle physiology	Dr. J. Fewell
10	Neuro-9	W 28 Sept	Peripheral nervous system – efferent: Autonomic nervous system	Dr. J. Fewell
	No Class	F 30 Sept	National Day for Truth & Reconciliation	
11	Neuro-10	M Oct 3	Thermoregulation & Fever	Dr. J. Fewell
12	Exam 1	W Oct 5	Neurophysiology Unit Exam	Dr. J. Fewell

		F 7 Oct	Work on Essay	Student
	No Class	M 10 Oct	Thanksgiving Day	
13	CV-1	W 12 Oct	Introduction Structure and function of the heart and circulation	Dr. J. Fewell
14	CV-2	F 14 Oct	Electrical properties of the heart	Dr. J. Fewell
15	CV-3	M 17 Oct	Electrocardiogram, cardiac arrhythmias and ECG interpretation	Dr. J. Fewell
16	CV-4	W 19 Oct	Microcirculation, lymphatic system and Starling forces	Dr. J. Fewell
17	CV-5	F 21 Oct	Cardiac muscle physiology & metabolism	Dr. J. Fewell
18	CV-6	M 24 Oct	Cardiac excitation-contraction coupling	Dr. J. Fewell
19	CV-7	W 26 Oct	Cardiac cycle & assessment of ventricular performance	Dr. J. Fewell
20	CV-8	F 28 Oct	Coronary physiology & mechanical determinants of oxygen demand	Dr. J. Fewell
21	CV-9	M 31 Oct	Neurohumoral regulation of the heart and circulation	Dr. J. Fewell
22	CV-10	W 2 Nov	Heart failure & circulatory shock	Dr. J. Fewell
23	EXAM 2	F 4 Nov	Cardiovascular Unit Exam	Dr. J. Fewell
	No Class	6-12 Nov	Fall term Break - Remembrance Day	
24	Resp-1	M 14 Nov	Introduction Concept of internal & external respiration Structure & function of the lung	Dr. J. Fewell
25	Resp-2	W 16 Nov	Ventilation Surfactant	Dr. J. Fewell
26	Resp-3	F 18 Nov	Diffusion Blood flow - perfusion	Dr. J. Fewell
27	Resp-4	M 21 Nov	Ventilation/Perfusion relationship	Dr. J. Fewell
28	Resp-5	W 23 Nov	Causes of hypoxemia	Dr. J. Fewell
29	Resp-6	F 25 Nov	Blood gases Pulmonary acid-base homeostasis	Dr. J. Fewell
30	Resp-7	M 28 Nov	Gas transport to the periphery	Dr. J. Fewell
31	Resp-8	W 30 Nov	Control of ventilation – sensors, central controller & effectors	Dr. J. Fewell
32	Resp-9	F 2 Dec	Lung function tests – ventilation & gas exchange	Dr. J. Fewell
33	Resp-10	M 5 Dec	Respiratory insufficiency & failure	Dr. J. Fewell
34	EXAM 3	W 7 Dec	Respiratory Unit Exam	Dr. J. Fewell

Class Lecture & Examination Schedule – 2023 Winter Term

#	Unit	Date	Lecture	Faculty
35	Endo-1	M 9 Jan	Overview of the Endocrine System	Dr. F. Smith
36	Endo-2	W 11 Jan	The Hypothalamus & Pituitary Gland	Dr. F. Smith
37	Endo-3	F 13 Jan	The Thyroid Glands	
38	Endo-4	M 16 Jan	The Parathyroid Glands & Vitamin D	Dr. F. Smith
39	Endo-5	W 18 Jan	The Adrenal Glands	Dr. F. Smith
40	Endo-6	F 20 Jan	The Stress Response	Dr. F. Smith
41	Endo-7	M 23 Jan	The Endocrine Pancreas	Dr. F. Smith
42	Endo-8	W 25 Jan	The Male Reproductive System	Dr. F. Smith
43	Endo-9	F 27 Jan	The Female Reproductive System	Dr. F. Smith
44	Endo-10	M 30 Jan	Fertilization, Pregnancy & Labor	Dr. F. Smith
45	Endo-11	W 1 Feb	No assigned lecture; may use for review / study time	Dr. F. Smith
46	Exam 4	F 3 Feb	Endocrine Unit Exam	Dr. F. Smith
47	Renal-1	M 6 Feb	Overview of Kidney Function / Organization of the Kidney	Dr. F. Smith
48	Renal-2	W 8 Feb	The Tubule	Dr. F. Smith
49	Renal-3	F 10 Feb	Renal Circulation	Dr. F. Smith
50	Renal-4	M 13 Feb	Glomerular Filtration	Dr. F. Smith
51	Renal-5	W 15 Feb	Sodium & Chloride Tubular Handling	Dr. F. Smith
52	Renal-6	F 17 Feb	Organic Solutes	Dr. F. Smith
		19-25 Feb	Winter Term Break includes Alberta Family Day	
53	Renal-7	M 27 Feb	Potassium Handling	
54	Renal-8	W 1 Mar	Acid Base Balance	
55	Renal-9	F 3 Mar	Water Handling	
56	Renal-10	M 6 Mar	Urine Concentration & Dilution	
57	Renal-11	W 8 Mar	Overview of Renal Function & Fluid Volume Regulation	
58	Exam 4	F 10 Mar	Renal Unit Exam	
59	GI&L-1	M 13 Mar	Introduction to GI function & Anatomy	Dr. DM McCafferty
60	GI&L-2	W 15 Mar	Brain-gut axis and the Enteric Nervous System	Dr. DM McCafferty
61	GI&L-3	F 17 Mar	Electrolyte and water transport	Dr. DM McCafferty
62	GI&L-4	M 20 Mar	Gastric Secretion	Dr. DM McCafferty
63	GI&L-5	W 22 Mar	Gastrointestinal motor function	Dr. DM McCafferty
64	GI&L-6	F 24 Mar	Hepatobiliary System	Dr. DM McCafferty
65	GI&L-7	M 27 Mar	Pancreatic exocrine function	Dr. DM McCafferty
66	GI&L-8	W 29 Mar	Digestion and Absorption I	Dr. DM McCafferty

67	GI&L-9	F 31 Mar	Digestion and Absorption II	Dr. DM McCafferty
68	GI&L-10	M 3 Apr	Gut Mucosal Defense	Dr. DM McCafferty
69	Exam 6	W 5 Apr	GI & L Unit Exam	Dr. DM McCafferty