



A POLYTECHNIC INSTITUTION

School of Health Sciences
Program: Medical Radiography
Option:

BHSC 2213
Anatomy and Physiology 2 (MRAD)

Start Date:	September 7, 2004	End Date:	December 2, 2004
Total Hours:	14	Total Weeks:	14
Hours/Week:	2	Lecture:	2 (alternating)
		Lab:	
		Shop:	
		Seminar:	
		Other:	
		Term/Level:	2
		Course Credits:	1

Prerequisites

Course No.	Course Name
BHSC 1113	Anatomy and Physiology 1 (MRAD)

BHSC 2213 is a Prerequisite for:

Course No.	Course Name
MRAD 2204	
MRAD 3304	

■ Course Description

BHSC 2213 Anatomy and Physiology 2 (MRAD) continues from BHSC 1113. This course introduces human anatomy and physiology using a systems approach. Emphasis is placed on those systems most commonly examined by the radiographic technologist. The lymphatic and endocrine systems are studied first. Then principles of homeostasis and feedback control are introduced and applied to the study of the respiratory, digestive, urinary and reproductive systems.

■ Evaluation

Midterm – Week 4	40%	Comments: • The pass mark for this course is 60%.
Assignment	10%	
Final Exam	50%	
TOTAL	100%	

■ Course Learning Outcomes/Competencies

Upon successful completion of this course, the student will be able to:

1. Define homeostasis in the context of cell function requirements and physiological function of organ systems.
2. Describe the action of control systems components in negative and positive feedback control systems.
3. Explain the roles of the endocrine system in maintaining homeostasis and regulating physiological functions; explain and give examples of feed-forward, negative and positive feedback; describe the tissues of the endocrine system in terms of form and function.
4. Describe the essential functions of the lymphatic system and how it relates to general fluid circulation in the body.
5. Describe how lymph is formed and the role of the lymph capillaries in the regulation of interstitial fluid volume.

■ **Course Learning Outcomes/Competencies (cont'd.)**

6. Describe the structures of the respiratory system and describe the path that air takes during a respiratory cycle.
7. Explain the relationship between muscular activity and pressure changes involved in the respiratory cycle.
8. Describe the role of pulmonary circulation in gas exchange across the lungs.
9. Describe the general structure of the alimentary tract and the relationships of the accessory digestive organs.
10. Describe the functions of the parts of the alimentary tract and accessory digestive organs with relation to mechanical and chemical digestion and absorption of nutrients.
11. Describe the basic structure of the urinary tract.
12. Describe the structure of the kidney on both a macroscopic and microscopic level with particular attention to the structure of the nephron.
13. Explain the relative contributions of filtration, secretion and resorption to the formation of urine.
14. Describe the major components of the male and female reproductive systems.
15. Describe the relational anatomy of organs in the female and male pelvis; recognize and identify structures from their location and sectional appearance.
16. Describe the basic physiology of the male and female reproductive systems and the physiological changes associated with pregnancy.

■ **Verification**

I verify that the content of this course outline is current.

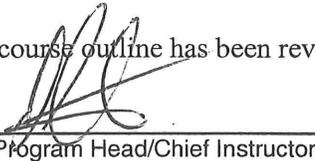


Authoring Instructor

Sept. 03/04

Date

I verify that this course outline has been reviewed.



Program Head/Chief Instructor

Sept 3, 2004

Date

I verify that this course outline complies with BCIT policy.



Dean/Associate Dean

Sept. 3/04

Date

Note: Should changes be required to the content of this course outline, students will be given reasonable notice.

■ **Instructor(s)**

Robert Harris	Office Location: SW3-3090	Office Phone: 604-432-8226
	Office Hrs.: TBA	E-mail Address: robert_harris@bcit.ca

■ **Learning Resources**

Required:

Tortora & Grabowski. (2000). *Introduction to the Human Body* (5th ed.). 2001. Wiley.

Medical dictionary, as required by program.

Text Reference:

Moore, K.L. and Dalley, A.F. 1999. *Clinically Oriented Anatomy* (4th ed.). Lippincott, Williams & Wilkins.

Weir, J. and Murray, A.D. 1998. *Mosby's Atlas and Text of Clinical Imaging*. Mosby-Wolfe.

Weir, J. and Abrahams, P.H. 2003. *Imaging Atlas of Human Anatomy* (3rd ed.). Mosby-Wolfe.

Cotran, R.S., Kumar, V. and Collins, T. 1999. *Robbins' Pathologic Basis of Disease* (7th ed.). W.B. Saunders.

Vander, A., Sherman, J. and Luciano, D. 1998. *Human Physiology: The Mechanisms of Body Function* (7th ed.). WCB/McGraw-Hill.

Website Reference:

"<http://www.netanatomy.com>" — One of the best sites on the web for radiographic and cross-sectional anatomy. Requires Macromedia Flash 5 or higher to view image labels and correlations. An excellent reference.

"<http://www.med.nus.edu.sg/ant/e-museum/museum.html>" — Electronic Anatomy Museum

"http://anatomy.uams.edu/htmlpages/anatomyhtml/gross_atlas.html" — Gross Anatomy Atlas Images

"<http://anatomy.uams.edu/htmlpages/anatomyhtml/medcharts.html>" — Anatomy Tables. A series of anatomy tables (bones, arteries, joints, etc.) organized both by systems and by regions.

"http://www.nlm.nih.gov/research/visible/visible_human.html" — The National Library of Medicine & Visible Human Project. The Visible Human Project presents complete, anatomically detailed, three-dimensional representations of the normal male and female human bodies. The site features transverse CT, MR and cryosection images of representative male and female cadavers. The male was sectioned at one centimeter intervals, the female at one-third centimeter intervals.

"http://www.med.wayne.edu/diagRadiology/Anatomy_Modules/Pelvis/Pelvis.html" — Anatomy of the Pelvis

"http://www.med.wayne.edu/diagRadiology/Anatomy_Modules/Abdomen.html" — CT Anatomy of the Upper Abdomen

■ Learning Resources (cont'd.)

"<http://ww.vh.org/adult/provider/anatomy/HumanAnatomy/CrossSectionAtlas.html>" — Virtual Hospital: Atlas of Human Anatomy in Cross Section

"<http://www.vh.org/adult/provider/radiology/NormalRadAnatomy/index.html>" — Virtual Hospital: Normal Radiologic Anatomy: X-Ray, CT, MRI and Ultrasound

■ Information for Students

1. During the first class the instructor and student responsibilities and evaluation methods will be discussed and agreed upon.
2. Students will participate in a verbal and written review of the course and instructor performance at midterm and at the end of term.
3. **Attendance** is required in this course as much of the material presented in lecture will not be available in other formats and as active involvement in discussion and lecture constitutes a significant portion of the course. Therefore, if students are absent for more than 10% of the planned activities without a documented medical reason, they will not meet the attendance requirement of the course and may be withdrawn from the course (see BCIT policy re: attendance).
4. **Illness:** A doctor's note is required for any illness causing you to miss assignments, quizzes, tests, projects or exams. At the discretion of the instructor, you may complete the work missed or have the work prorated.
5. **Student written work** is assumed to be original and specific to this course. Plagiarism, the presentation of other's written work as one's own, will not be tolerated (see BCIT policy re: plagiarism). The same applies to any aid that gives a student an unfair advantage in a **written examination** (see BCIT policy re: cheating). Incidents of cheating or plagiarism may, therefore, result in a grade of zero for the assignment, quiz, test, exam or project for all parties involved and/or expulsion from the course.
6. **Attempts:** Students must successfully complete a course within a maximum of three attempts at the course. Students with two attempts in a single course will be allowed to repeat the course only upon special written permission from the Associate Dean. Students who have not successfully completed a course within three attempts will not be eligible to graduate from the appropriate program.
7. **Course Outline Changes:** The material or schedule specified in this course outline may be changed by the instructor. If changes are required, they will be announced in class.

■ Assignment Details

This is worth 10 % of your grade and is designed to reinforce your understanding of critical aspects of the course and to get you to engage in translating sectional anatomy into three dimensions and vice versa.

Assignment

Pick a clinically relevant disorder affecting one of the systems covered in the course. Describe what is currently known about the cause of the disorder, the physiological basis for the major symptoms and the currently accepted treatment options.

Describe the radiographic appearance and any radiographic progressions that occur.

Schedule

No. of Hours	Description
2	<p>Lymphatic System <i>Functions</i> <i>Structure</i></p> <ul style="list-style-type: none"> — lymph capillaries, lymphatic drainage — lymph node, distribution and function — major lymphatic vessels <p><i>Lymph Circulation</i></p>
1	<p>Control Systems <i>Homeostasis and Feedback</i> <i>Regulation</i></p> <ul style="list-style-type: none"> — components — control system function
4	<p>Endocrine System <i>Endocrine Function</i></p> <ul style="list-style-type: none"> — mechanism of hormone specificity — determinants of hormone level in the blood — control of endocrine function <p><i>Survey of Major Endocrine Glands</i></p> <ul style="list-style-type: none"> — location, hormones produced, effects on target tissue
5	<p>Respiratory System <i>Structure</i></p> <ul style="list-style-type: none"> — airway terminology and structure <p>Position of lungs, lobes, visceral and parietal pleura, intrapleural space and fluid, intra-alveolar space.</p> <p><i>Ventilatory mechanics</i></p> <ul style="list-style-type: none"> — inspiratory and expiratory muscles, pressure changes <p><i>Pulmonary circulation</i></p> <ul style="list-style-type: none"> — pulmonary arteries and veins, gaseous exchange in alveoli, hemoglobin and oxygen transport
Week 4	<p>Midterm Exam <i>Topics:</i></p> <ul style="list-style-type: none"> — Lymphatic System, Control Systems, Endocrine and Respiratory Systems
5	<p>Urinary System <i>Basic Structures:</i> <i>Kidney</i></p> <ul style="list-style-type: none"> — blood supply and drainage — cortex, medulla, renal pyramids, renal columns, calyces, renal pelvis, nephron (Bowman's capsule, PCT, descending and ascending limbs of loop of Henle, DCT, afferent and efferent arterioles, glomerulus, peritubular capillaries), collecting duct

No. of Hours	Description
	<p>Urinary System (cont'd.) <i>Ureters, Urinary Bladder, Urethra</i> Urine formation and composition: <i>Filtration</i> <i>Tubular reabsorption and secretion</i> Urine composition and pH range Micturition: Muscles involved and neural control</p>
6	<p>Digestive System <i>General organization of the alimentary canal</i> — structure of the major alimentary canal regions <i>Digestion in major alimentary regions</i> — principles of digestion <i>Absorption</i> — principles and intestinal adaptations <i>Elimination</i> — evacuation from the alimentary canal</p>
5	<p>Reproductive System <i>Female Reproductive System</i> — anatomic relations of organs in pelvic cavity — detailed anatomy: ovary to external genitalia — breast anatomy <i>Male Reproductive System</i> — detailed anatomy and relationship of organs — semen production <i>Male and female gametogenesis</i> <i>Ovarian and uterine cycling</i> <i>Fertilization</i></p>