



A POLYTECHNIC INSTITUTION

School of Health Sciences

Program: Medical Radiography

Option:

**BHSC 2213****Anatomy and Physiology 2 (MRAD)****Start Date:** September 2005**End Date:** December 2005**Total Hours:** 28 **Total Weeks:** 7**Term/Level:** 2 **Course Credits:** 2**Hours/Week:** 4 **Lecture:** 4 (alternating) **Lab:****Shop:** **Seminar:** **Other:****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 continues the exploration of human anatomy and physiology using a systems approach. Emphasis is placed on those systems most commonly examined by the radiographic technologist. Principles of homeostasis and feedback control are introduced first, followed by study of the endocrine system and its secretions. The structure and function of the lymphatic, digestive, urinary and reproductive systems are also explored with emphasis on imaging anatomy and diagnostic procedures related to radiography.

**■ Evaluation**

Midterm – Week 4

50%

Comments:

Final Exam

50%

- The pass mark for this course is 60%.

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 components of negative and positive feedback control systems; contrast the function of negative feedback control with positive feedback and feed-forward.
3. explain the roles of the endocrine system in maintaining homeostasis and regulating physiological functions.
4. describe the structure and location of each of the endocrine glands.
5. list the secretions of the glands, and their functions; predict the effects of hormone deficiency or excess.
6. describe the structure and function of the lymphatic system.

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

7. describe how lymph is formed and circulated.
8. predict the conditions that would lead to excess lymph formation and lymphatic obstruction.
9. describe the structures of the respiratory system and describe the path that air takes during a respiratory cycle.
10. explain the mechanics of ventilation in terms of the volume changes, muscular activity and pressure changes during a respiratory cycle.
11. describe the pulmonary circulation and compare pulmonary pressures to systemic vascular pressures.
12. identify lung capacities and volumes and calculate them from selected data.
13. describe how ventilation is regulated.
14. describe the general structure of the alimentary tract and the relationships of the accessory digestive organs.
15. describe the functions of the parts of the alimentary tract in terms of mechanical and chemical digestion and absorption of nutrients.
16. describe the structure and function of the liver, biliary tract, and pancreas.
17. describe the structure and function of the kidneys and urinary tract.
18. describe the structure of the nephron and relate each component to the formation of urine and maintenance of the volume and composition of extracellular fluid.
19. explain the relative contributions of filtration, secretion and resorption to the formation of urine.
20. describe the transportation, storage and elimination of urine in the lower urinary tract.
21. describe the major components of the male and female reproductive systems.
22. describe the structure and function of the reproductive organs in the female and male pelvis; recognize and identify structures from their location and sectional appearance.
23. describe the regulation of male and female reproductive function and the physiological changes associated with pregnancy.

## ■ Information for Students

1. During the first class the instructor and student responsibilities and evaluation methods will be discussed and agreed upon.
2. Students may participate in a verbal and written review of the course and instructor performance at midterm and at the end of term.  
**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).
3. **Assignments:** Late assignments will not be accepted for marking. Assignments must be done on an individual basis unless otherwise specified by the instructor.
4. **Makeup Tests, exams or quizzes:** There will be no makeup tests, exams or quizzes. If you miss a last exam or quiz you will receive a mark of zero. Exceptions will be made for documented medical reasons or extenuating circumstances. In such a case it is the responsibility of the student to inform the instructor immediately.
5. **Ethics:** BCIT assumes that all students attending the Institute will follow a high standard of ethics. Incidents of cheating and plagiarism may, therefore, result in a grade of zero for the exam, assignment or quiz for all the parties involved and/or expulsion from the course.
6. **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.
7. **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.
8. **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.
9. **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.
- 10.

### Schedule

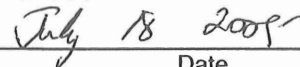
No. of Hours	Description
2	<b>Lymphatic System</b> <i>Structures and Function</i> <ul style="list-style-type: none"> <li>— role of lymphatic system in the immune response</li> <li>— lymph capillaries, lymphatic drainage</li> <li>— lymph node, distribution and function</li> <li>— major lymphatic vessels</li> <li>— spleen and thymus</li> </ul> <i>Lymph Circulation</i>
1	<b>Control Systems</b> <i>Homeostasis and Negative Feedback Control</i> <ul style="list-style-type: none"> <li>— components</li> <li>— control system function</li> </ul> <i>Positive Feedback Feedforward</i>
4	<b>Endocrine System</b> <i>Endocrine Function</i> <ul style="list-style-type: none"> <li>— mechanism of hormone specificity</li> <li>— determinants of hormone level in the blood</li> <li>— control of endocrine function</li> </ul> <i>Survey of Major Endocrine Glands</i> <ul style="list-style-type: none"> <li>— location, hormones produced, effects on target tissue</li> </ul>
5	<b>Respiratory System</b> <i>Structure</i> <ul style="list-style-type: none"> <li>— airway terminology and structure</li> <li>— position of lungs lobes visceral and parietal</li> </ul>

No. of Hours	Description
5	<b>Urinary System</b> <i>Basic Structures:</i> <i>Kidney</i> <ul style="list-style-type: none"> <li>— blood supply and drainage</li> <li>— 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</li> </ul>
	<b>Lower Urinary Tract</b> <ul style="list-style-type: none"> <li>— Ureters, Urinary Bladder, Urethra</li> </ul> <i>Urine formation and composition:</i> <ul style="list-style-type: none"> <li>— Filtration</li> <li>— Tubular reabsorption and secretion</li> <li>— Urine concentration</li> <li>— Urine composition</li> </ul> <i>Micturition:</i> <ul style="list-style-type: none"> <li>— Muscles involved and neural control of micturition</li> </ul>
6	<b>Digestive System</b> <i>General organization of the alimentary canal</i> <ul style="list-style-type: none"> <li>— structure of the major alimentary canal regions</li> </ul> <i>Structure and relationship of organs of the intestinal tract</i> <i>Digestion</i> <ul style="list-style-type: none"> <li>— mechanical and chemical digestion</li> </ul> <i>Absorption</i> <ul style="list-style-type: none"> <li>— principles and intestinal adaptations</li> </ul> <i>Elimination</i> <ul style="list-style-type: none"> <li>— evacuation from the alimentary canal</li> </ul> <i>Accessory organs:</i> <ul style="list-style-type: none"> <li>— Liver: structure and function</li> <li>— Gall bladder and biliary tract: formation and secretion of bile, excretion of bilirubin. Jaundice.</li> <li>— Pancreas: endocrine and exocrine secretions. Control of pancreatic and biliary secretions.</li> </ul>
5	<b>Reproductive System</b> <i>Female Reproductive System</i> <ul style="list-style-type: none"> <li>— anatomic relations of organs in pelvic cavity</li> <li>— detailed anatomy: ovary to external genitalia</li> </ul> <i>Male Reproductive System</i> <ul style="list-style-type: none"> <li>— breast anatomy</li> <li>— detailed anatomy and relationship of organs</li> <li>— semen production</li> </ul> <i>Male and female gametogenesis</i> <i>Ovarian and uterine cycling</i> <i>Fertilization</i>
Week 8	<b>Final Examination</b>

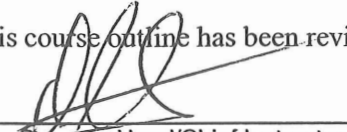
■ Verification

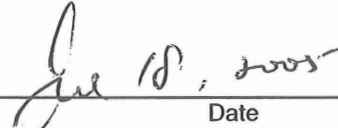
I verify that the content of this course outline is current.

  
\_\_\_\_\_  
Authoring Instructor

  
\_\_\_\_\_  
Date

I verify that this course outline has been reviewed.

  
\_\_\_\_\_  
Program Head/Chief Instructor

  
\_\_\_\_\_  
Date

I verify that this course outline complies with BCIT policy.

  
\_\_\_\_\_  
Dean/Associate Dean

  
\_\_\_\_\_  
Date

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

## ■ Instructor(s)

John Emes, PhD	Office Location: SW3-3090	Office Phone: 604-451-6920
	Office Hrs.: TBA	E-mail Address: John_Emes@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 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](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](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](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](http://www.med.wayne.edu/diagRadiology/Anatomy_Modules/Abdomen.html)" — CT Anatomy of the Upper Abdomen

"<http://www.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