



A POLYTECHNIC INSTITUTION

School of Health Sciences

Program: Medical Radiography

Option:

BHSC 2213**Anatomy and Physiology 2 (MRAD)**

Start Date:	September 2, 2003	End Date:	December 12, 2003
Total Hours:	28	Total Weeks:	14
Hours/Week:	2	Lecture:	2 (average)
		Lab:	
Prerequisites		BHSC 2213 is a Prerequisite for:	
Course No.	Course Name	Course No.	Course Name
BHSC 1113	Anatomy and Physiology 1 (MRAD)	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:
Assignment	10%	• The pass mark for this course is 60%.
Final Exam	50%	
TOTAL	100%	

■ Course Learning Outcomes/Competencies

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

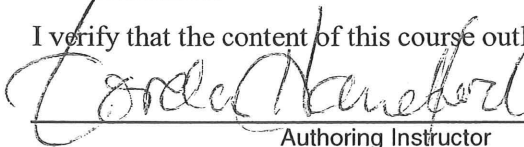
1. describe the essential functions of the lymphatic system.
2. relate the role of lymph capillaries to tissue fluid turnover.
3. define homeostasis in the context of cell function requirements.
4. explain the roles of the endocrine system in maintaining individual and species homeostasis; explain and give examples of feed forward, positive and negative feedback; describe the glands of the endocrine system in terms of their location, the hormones produced and the effect on target organs.
5. describe the action of control system components in a negative feedback control system.
6. identify the path that inspired air takes from the external nares to the alveoli.

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

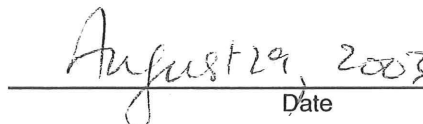
7. describe the lungs in terms of position in the thoracic cavity and relationships to pleura, fissures, lobes and bronchopulmonary segments.
8. explain the muscular activity and associated pressure changes which occur during one respiratory cycle.
9. describe the pulmonary circulation in terms of the arrangement of blood vessels, the transport of respiratory gases, and gaseous exchange.
10. describe the anatomy of the lower urinary tract, and the regulation of its activity.
11. describe the general structure of the alimentary tract and the relationships of accessory organs, together with peritoneal relationships.
12. describe the functions of the various parts of the alimentary tract in terms of mechanical and chemical digestion and absorption.
13. describe the basic structure of the urinary system, to the nephron level.
14. use the terms filtration, secretion, and reabsorption, to describe urine formation and composition.
15. describe the structure and function of the lymphatic system, including formation and composition of lymph and its drainage paths and mechanisms of circulation.
16. describe the major components of the female and male reproductive systems, and identify their functions.
17. describe the relational anatomy of organs in the female and male pelvis; recognize and identify structures from their location and sectional appearance.

■ **Verification**

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

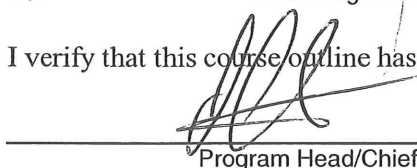


Authoring Instructor




Date

I verify that this course outline has been reviewed.

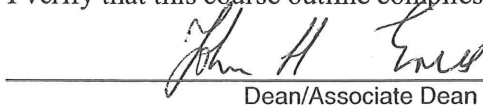


Program Head/Chief Instructor



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)

Gordon Handford

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Office Hrs.: TBA

E-mail Address: Gordon_Handford@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

"<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.

■ 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** — Choose any two systems in the head and neck, thorax, or abdomen that have an intimate spatial interrelationship and, in your own words, describe their relational anatomy, one to the other. You can focus on portions of the two systems you have chosen but you should cover some significant physical territory. Illustrate your discussion by regular reference to clearly labeled and identified sectional images (which you will print or copy and include with your assignment). You may get these sectional images from texts or from the Internet (good websites are recommended in your course outline). Then research and very briefly describe one example of a pathology that might affect this three dimensional interrelationship. (Don't get into a complex discussion of the pathophysiology, treatment and course, etc.!) Describe, in concrete terms, how this pathology might distort the anatomy of either or both of the systems you have chosen to focus on. Your information on the pathology can come from the Internet, from journal articles, or from conventional textbooks. Please give appropriate citation for your images and references.
- *To give an example, you could relate the three dimensional anatomy of the ventricular system in the brain to the anatomy of the basal ganglia. Moving in some systematic way through the brain, you would give a verbal description of how these two systems physically impinge on and relate to one another. You would make*

■ **Assignment Details (cont'd.)**

frequent detailed reference to the images you have chosen). Then you would describe a pathology that one might expect to alter the shape of some component and thereby affect the sectional anatomy of the other components, for example Alzheimer disease. What pattern of change might we expect? How would it show up in scans or ventriculography?

- How long? And how will it be graded? The length depends upon the complexity of the systems described and the wealth of illustrative images to which one might refer and to the predictability of the pathology. I would think it would be difficult to do a decent job in less than a page (not counting your printout or photocopied images). Conversely, I don't want to read ten pages. So, brief and to the point, but covering the subject. The grade will depend upon a combination of the quality of the description of the relational anatomy and the difficulty of the task. The relational anatomy of the systems suggested is challenging, but on the other hand you have had a lot of the anatomy described in detail for the individual systems. So I would rate this a moderate difficulty task and would be looking for a good, thorough description to score 10 out of 10. Remember, one motivation for assigning this is to encourage you to review the sectional anatomy. So I will be fairly comfortable giving 7-8 for decent effort. "10" will be earned. You will get feed back and are welcome to challenge your grade.

Schedule

No. of Hours	Description
2	Lymphatic System <i>Functions</i> <i>Structure</i> <i>Lymph Circulation</i> <ul style="list-style-type: none"> — lymph capillaries, lymphatic drainage — lymph node, distribution and function — major lymphatic vessels
1	Control Systems <i>Homeostasis and Feedback</i> <i>Regulation</i> <ul style="list-style-type: none"> — components — control system function
4	Endocrine System <i>Endocrine Function</i> <i>Survey of Major Endocrine Glands</i> <ul style="list-style-type: none"> — mechanism of hormone specificity — determinants of hormone level in the blood — control of endocrine function — location, hormones produced, effects on target tissue
5	Respiratory System <i>Structure</i> Position of lungs, lobes, visceral and parietal pleura, intrapleural space and fluid, intraalveolar space. <i>Ventilatory mechanics</i> <i>Pulmonary circulation</i> <ul style="list-style-type: none"> — airway terminology and structure — inspiratory and expiratory muscles, pressure changes — pulmonary arteries and veins, gaseous exchange in alveoli, hemoglobin and oxygen transport
Week 4	Midterm Exam <i>Topics:</i> <ul style="list-style-type: none"> — Lymphatic System, Control Systems, Endocrine and Respiratory Systems
5	Urinary System <i>Basic Structures:</i> <i>Kidney</i> <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
	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
6	Digestive System <i>General organization of the alimentary canal</i> — structure of the major alimentary canal regions — principles of digestion <i>Digestion in major alimentary regions</i> <i>Absorption</i> — principles and intestinal adaptations <i>Elimination</i> — evacuation from the alimentary canal
5	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>