BCIT®

POLYTECHNIC INSTITUTION

School of Health Sciences
Program: Medical Radiography
Option:

Course Outline

BHSC 2213
Anatomy and Physiology 2 (MRAD)

Start Date:	September, 2002			**End Date:**	December, 2002		
Total Hours:	28	**Total Weeks:**	14	**Term/Level:**	2	**Course Credits:**	2
Hours/Week:	2	**Lecture:**	2 (average) **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 introduces human anatomy and physiology using a systems approach. Emphasis is placed on those systems most commonly examined by the radiographic technologist. Systems covered in this course are nervous, cardiovascular, lymphatic, endocrine and reproductive.

Detailed Course Description

- To provide a basic understanding of human anatomy and physiology that can be applied to other courses in the radiography program.
- To give the student sufficient background to function effectively in the clinical setting when confronted with both commonly encountered and unfamiliar physiologic and pathologic states.

Evaluation

First Midterm	30%
Second Midterm	30%
Final Exam	40%
TOTAL	100%

Comments:

- The pass mark for this course is 60%.

■ Course Learning Outcomes/Competencies

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

1. describe the major structures of the nervous system (brain, spinal cord and spinal and cranial nerves); describe and explain the various types of protection afforded the CNS.
2. relate the parts of the CNS to the enclosing bones of the skull and the spinal column.
3. where appropriate, relate selected CNS structures to generalized functions.
4. describe the arterial supply and venous drainage of the brain; identify principal vascular features on appropriate angiograms and MRAs.
5. identify the brain ventricles, CSF cisterns, selected white matter tracts, thalamus, hypothalamus, basal ganglia, hippocampus, etc. in a variety of different planes and sections.
6. describe the composition of blood, the function of the formed elements, erythropoiesis and red blood cell destruction.
7. describe the circulatory system in terms of the structure and function of the pulmonary and systemic circulations; describe the circulatory and exchange vessels and their functions, and explain the physiology of blood flow.
8. describe the location, structure and function of the heart, the myocardial sac; describe basic myocardial physiology and myocardial blood supply and drainage.
9. relate systolic and diastolic arterial blood pressure and blood pumping to the electrical, mechanical and audible events of the cardiac cycle.
10. describe and differentiate between features of fetal circulation and that of the neonate.
11. describe the structure and function of the lymphatic system, including formation and composition of lymph and its drainage paths and mechanisms of circulation.
12. 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.
13. describe the major components of the female and male reproductive systems, and identify their functions.
14. 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: 22 Aug '02

I verify that this course outline has been reviewed.

Program Head/Chief Instructor — Date: Sep. 2, 2002

I verify that this course outline complies with BCIT policy.

Dean/Associate Dean — Date: Aug. 29 2002

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

■ Instructor(s)

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■ Learning Resources

Required:

Principles of Anatomy and Physiology, 9th Edition, 2000, Tortora and Grabowski, Harper Collins.

Access to a good medical dictionary

Recommended:

Human Anatomy and Physiology, 5th Edition, 2001, E.N. Marieb, Benjamin/Cummings Publishing Co. Inc., Redwood City, California.

Anatomy and Physiology: The Unity of Form and Function, 2nd Edition, 2001, K.S. Saladin, WCB/McGraw-Hill, Boston.

Clinically Oriented Anatomy by K. Moore.

Human Physiology, 7th Edition, 1998, A.J. Vander, J.H. Sherman and D.S. Luciano, McGraw-Hill Publishing Co., New York.

■ Information for Students

(*Information below can be adapted and supplemented as necessary.*)

Assignments: Late assignments, lab reports or projects will **not** be accepted for marking. Assignments must be done on an individual basis unless otherwise specified by the instructor.

Makeup Tests, Exams or Quizzes: There will be **no** makeup tests, exams or quizzes. If you miss a test, exam or quiz, you will receive zero marks. Exceptions may 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**.

Ethics: BCIT assumes that all students attending the Institute will follow a high standard of ethics. 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.

Attendance: The attendance policy as outlined in the current BCIT Calendar will be enforced. Attendance will be taken at the beginning of each session. Students not present at that time will be recorded as absent.

Illness: A doctor's note is required for any illness causing you to miss assignments, quizzes, tests, projects or exam. At the discretion of the instructor, you may complete the work missed or have the work prorated.

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.

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

Material will be examined during regular examinations. There are no written assignments.

Schedule

Week Number (# of Hours)	Description
1–3 (12 hours)	**Nervous System**
	Nervous Tissue — neuroglia, neurons — signal processing
	Basic Structures *Brain* — cerebrum, brain stem, cerebellum *Spinal Cord* *Skull and Vertebral Column* *Meningeal Layers and Reflections* *Ventricular System*
	Review of Bony Protection *Cranial Vault* — bones, petrous temporal bone (middle and inner ear), sella turcica, fossae and foraminae, clivus *Vertebral Column* — functions, general features of vertebrae, features specific to level, the intervertebral disc, ligaments, relation of bony to NS anatomy
	Meningeal Protection *Roles of CSF* *Meningeal Membranes* — dura and dural reflections, venous sinuses, arachnoid and subarachnoid space, CSF cisterns, transverse cerebral fissure, pia, differences between cranial and spinal meninges *CSF Production and Circulation* — choroid plexus, ependyma, ventricles, medial and lateral foraminae, arachnoid villi, blood-CSF barrier, absence of CSF-brain barrier
	Cerebrum *Embryonic Development* — neural tube, brain vesicles, cephalic flexure, development of C-shaped structures *Gross Superficial Anatomy* — hemispheres, lobes, landmarks, cortical localization of function *Cerebral Vasculature* — major arteries, veins and venous sinuses — corresponding angiograms *Gross Anatomy in Section* — corpus callosum, internal capsule, anterior and posterior commissures, thalamus, caudate, lentiform nucleus, hypothalamus including association with pituitary stalk and pituitary gland, ventricles, hippocampus, septum pellucidum, fornix, functions associated with each of foregoing

Week Number (# of Hours)	Description
	Brain Stem *Gross and Sectional Anatomy (and Functions Mediated)* — midbrain (cerebral peduncles, corpora quadrigemina, cerebral aqueduct, substantia nigra) — pons (fourth ventricle, cerebellar peduncles, motor, sensory and decussating fibres) — medulla (pyramids, decussation below the pyramids, inferior olives, dorsal columns and nuclei) — reticular formation present at all levels — conduction pathways present at all levels ***Cranial Nerves*** — names, numbers, functions, associated with cranial foraminae ***Spinal Cord*** *Gross Anatomy* — grey matter, white matter, central canal, dorsal root ganglion — dorsal columns, anterior median fissure — cervical and lumbar enlargements, conus medullaris, filum terminale, cauda equina — extent of cord vs dural membranes, lumbar cistern *Cord Tracts* — principal motor and sensory tracts — Brown-Séquard syndrome *Grey Matter* — location of sensory and motor relay neurons — the monosynaptic stretch reflex ***Peripheral Nervous System: Spinal vs Cranial Nerves*** — olfactory and optic vs all others — structure and functions of a peripheral nerve — cervical, brachial, lumbar and sacral plexuses — vagus, phrenic, ulnar, brachial, sciatic and femoral nerves — autonomic nervous system (very brief intro)

Week Number (# of Hours)	Description
4–6 (first hour) (8 hours)	**Cardiovascular System and Lymphatics** ***Cardiovascular System*** *Overall Design* — heart, arteries, capillaries, veins, pulmonary and systemic circulations *Blood* — plasma composition and functions — erythrocytes, formation and destruction — specific leukocytes — platelets *Heart* — location, pericardial sac, common myocardium, endocardium — atria, ventricles, valves, pacemaker and conduction system – cardiac cycle: electrical and mechanical events, the ECG *Arterial System* — elastic and muscular arteries, arterioles — capillary structure, movement of fluid and dissolved substances — names and locations of selected arteries *Venous System* — structure of veins and venules, valves — names and locations of selected veins *Fetal Circulation* — brief description — changes at birth ***Lymphatics*** *Functions* *Structure* — lymph capillaries, lymphatic drainage — lymph node, distribution of nodes — lymphoid tissue: nodules, spleen, thymus, tonsils *Lymph Circulation*
6 (2 hours)	***Endocrine System*** *Control of Endocrine Function* — feedback systems and homeostasis — role of hypothalamus and pituitary *Pituitary* — location, anterior and posterior pituitary and hormones secreted — Elster's rule of 6, 8, 10, 12 *Survey of Major Endocrine Glands* — location, hormones produced, effects on target tissue of thyroid, parathyroids, adrenals (cortex and medulla), endocrine, pancreas, pineal, ovary and testis

Week Number (# of Hours)	Description	
7 (4 hours)	***Reproductive System***	
	Female Reproductive System	— anatomic relations of organs in pelvic cavity — detailed anatomy: ovary to external genitalia — breast anatomy, cyclical changes and changes in pregnancy
	Male Reproductive System	— detailed anatomy and relationship of organs — semen production