BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

School of Health Sciences
Program: Medical Radiography
Option:

Course Outline

BHSC 2213
Anatomy and Physiology 2

Start Date: September, 2001 **End Date:** December, 2001

Course Credits: 2.0 **Term/Level:** 2

Total Hours: 28
Total Weeks: 14

Hours/Week: **Lecture:** 2 (average)

Prerequisites

Course No.	Course Name
BHSC 1113	Anatomy and Physiology 1

BHSC 2213 is a Prerequisite for:

Course No.	Course Name
MRAD 2204/3304	

Course Calendar 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.

Course Goals

- 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	35%
Second Midterm	25%
Final Exam	40%
TOTAL	100%

- First midterm is start of Week 4 and covers nervous system.
- Second midterm is start of Week 6 and covers cardiovascular system and lymphatics.
- Final exam is week of Dec. 10–14 and covers endocrine and reproductive systems (60%) and reviews content of MT1 and MT2 (40%).
- The pass mark for this course is 60%.

Course Learning Outcomes/Competencies

On successful completion of this course the student should 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 principle 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 r.b.c. 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 or 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.

Course Content Verification

I verify that the content of this course outline is current, accurate, and complies with BCIT Policy.

John H Emery — Program Head/Chief Instructor

August 28 2001 — Date

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BHSC 2213
Anatomy and Physiology 2

Instructor(s)

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Learning Resources

Required:

Principles of Anatomy and Physiology, Tortora and Grabowski, 9th Ed., 2000. Harper Collins.
Access to a good medical dictionary.

Recommended:

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

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

Clinically Oriented Anatomy by K. Moore.

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

BCIT Policy Information for Students

Attendance is required in this course as much of the material presented in lecture will not be available in other formats. 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.)

Assignment Details

There will likely be two learning assignments in this course. Material will be examined during regular examination. There are no written assignments.

Review of GI tract general structure, structure and role of esophagus

Week Number (# of Hours)	Description
1–3 (12 hours)	**Nervous System** ***Basic Structures*** *Brain* — cerebrum, brainstem, 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 boney 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. ***Nervous Tissue*** — neuroglia, neurons — signal processing ***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

Week Number (# of Hours)	Description
	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. ***Brainstem*** *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 fibers) — 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)
Exam #1	Beginning of Week 4. Covers Nervous System. Worth 35% – 1 hour

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*
Exam #2	Second class of Week 6. Covers Cardiovascular System and Lymphatics. Worth 25%. 1 hour.
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
Final Exam	During final exam period, 2 hours, worth 40%, covers Endocrine and Reproductive Systems (60%) and reviews content of MT 1 and 2 (40%).