A POLYTECHNIC INSTITUTION

Course Outline

School of Health Sciences
Program: Medical Radiography
Option:

BHSC 1113
Anatomy & Physiology 1

Start Date: January, 2004 **End Date:** April, 2004

Total Hours: 32 **Total Weeks:** 16 **Term/Level:** 1 **Course Credits:** 2.5
Hours/Week: 2 **Lecture:** 2

Prerequisites

Course No.	Course Name
None	

BHSC 1113 is a Prerequisite for:

Course No.	Course Name
BHSC 2213	Anatomy & Physiology 2

■ Course Description

An introduction to human anatomy and physiology using a systems approach. Emphasis is placed on those systems most commonly examined by the radiographic technologist. After a core of fundamentals are considered, the systems studied in this course are: skeletal, muscular, nervous and cardiovascular.

The remaining systems are covered in the second term anatomy and physiology course, BHSC 2213.

■ Detailed Course Description

The goals of this course are:

- to attain a basic understanding of human anatomy and physiology that can be applied to other courses in the Radiography program.
- to become familiar with basic sectional anatomy.

■ Evaluation

Quizzes		
Midterm 1	(February 10, 2004)	30%
Midterm 2	(March 4, 2004)	30%
Final Exam	(April 19–23, 2004)	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. use correct terminology to describe the location and relationships of structure in the normal body.
2. identify the components of the integument and their functions.

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

3. describe the skeletal system in terms of:
   a. functions
   b. types of bones
   c. the structure of a long bone
   d. location of red and yellow marrow in the child and the adult
   e. intramembranous and endochondral ossification of a long bone and the hormonal factors affecting growth
   f. the structure of a synovial joint.
4. relate a muscles structures and its attachments to bone to movement at joints.
5. describe the major movements produced by the action of contracting muscles.
6. 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.
7. relate the parts of the CNS to the enclosing bones of the skull and the spinal column.
8. where appropriate, relate selected CNS structures to generalized functions.
9. describe the composition of blood, the function of the formed elements, erythropoiesis and red blood cell destruction.
10. compare the structure of arteries, veins and capillaries.
11. describe the location, structure and function of the heart, the myocardial sac; describe basic myocardial physiology and myocardial blood supply and drainage.
12. relate systolic and diastolic arterial blood pressure and blood pumping to the electrical, mechanical and audible events of the cardiac cycle.
13. describe the circulatory and exchange vessels and their functions, and explain the physiology of blood flow.
14. describe the arterial supply and venous drainage of the brain.
15. describe and differentiate between features of fetal circulation and that of the neonate.
16. describe the essential functions of the lymphatic system; relate the role of lymph capillaries to tissue fluid turnover.

■ Verification

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

Corda Sandford — Authoring Instructor
Jan 05/04 — Date

I verify that this course outline has been reviewed.

[signature] — Program Head/Chief Instructor
Jan 05. 2004 — Date

I verify that this course outline complies with BCIT policy.

E. Riley. — Dean/Associate Dean
Jan 02/04 — Date

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

■ Instructor(s)

Gordon Handford

Office Location: SW3-3083
Office Hrs.: Tues. 12:30–2:30
Wed. 2:30–5:30

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■ Learning Resources

We will be covering all the examinable topics in class. To support their learning in this and several subsequent courses, you will need to acquire a comprehensive textbook in anatomy and physiology. Some suggested titles are:

Fundamentals of Anatomy and Phsyiology by Martini.
Human Anatomy and Physiology by Marieb.
Principles of Anatomy and Physiology by Tortora and Grabowski.
Clinically Oriented Anatomy by Moore and Agur.

Any of these might provide an excellent resource for better understanding the topics, seeing rich illustrations, having things presented in a different way from what I might do in class, seeing the material that isn't covered in class but may be important to your grasp of the topic. So take some time to work with a book to ensure that it fits your particular learning needs. The book you choose should be a fairly recent (last five years) edition. You are wise to get one on the second-hand market if you can, as long as it's recent (new versions of the above are $120 or so). Again, the most important factor is the fit of the book to your way of learning.

Reference:

The BCIT library has good holdings which may be useful to you in your studies.

General Anatomy and Physiology Books: These are located in call number group of QP 34, e.g., Textbook of Medical Physiology, Guyton, QP34.5 G9.

■ 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 at midterm and at the end of term. These reviews will focus on the course content and structure, instructor performance, contradictions and congruencies between course goals, content and process, and contextual factors that support or interfere with participation in the course.
3. Attendance is required in this course as much of the material presented in lecture will not be available in other formats. 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. 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.)

Schedule

No. of Hours	Description
4	**Functional Body Organization** • organization in terms of cells, tissues, organs and systems. • body cavities, gross contents, quadrants and regions of abdominopelvic cavity. • anatomical terminology • examples of sectional relationships of cavity contents (more details are given during discussion of the body systems). • review of Cytology and Histology.
1	**Integument** *Epidermis* — germinal layer, melanocytes, keratinisation. *Dermis* — blood vessels, sense receptors, sweat and sebaceous glands, hair roots. *Skin functions* — protection, body temperature control.
6	**Skeletal System** *Histology* — Haversion systems/osteons, lamellae of compact bone, trabeculae of spongy bone. *Functions* — support, protection, calcium storage, movement. *Types of bones* — long, short, flat, irregular, sesamoid, wormian. *Description of a long bone* — epiphysis, diaphysis, metaphysis, articular cartilage, cancellous and compact bone, periosteum, endosteum, marrow cavity, lamellae, Haversian and Volkmann's canals, canaliculi, Sharpey's fibers, nutrient foramina. *Description of a flat bone* — (skull is example) outer table, diploe, inner table, emissary vein channels, sinuses. *Bone marrow* — location of red and yellow marrow in non-adults and adults. *Development & growth of bone* — intramembranous ossification, endochondral ossification of a long bone – primary and secondary ossification centres, epiphyseal plate. *Joints* — brief description of synarthroses, amphiarthroses, diarthroses, structure of a generalized synovial joint — joint cavity, synovial, membrane and fluid, bursae, ligaments, menisci, joint capsule. *Movements* — adduction, abduction, flexion, extension, supination, pronation, rotation, circumduction, inversion, eversion, protraction, retraction, dorsi-flexion, hyperextension.
1	**FIRST MIDTERM EXAMINATION** **(February 10, 2004)**

No. of Hours	Description
2	**Muscular Systems** • muscle tissue subtypes • essentials of muscle structure • principles of muscle function
12	**Nervous System** *Nervous Tissue* — neuroglia, neurons — action potential and synaptic transmission
	Basic Structures *Brain* — cerebrum, brain stem, cerebellum
	Cerebrum *Gross Superficial Anatomy* — hemispheres, lobes, landmarks, cortical localization of function *Cerebral Vasculature* — major arteries, veins and venous sinuses *Gross Anatomy in Section* — corpus callosum, thalamus, basal ganglia, hypothalamus including association with pituitary stalk and pituitary gland, ventricles, septum pellucidum, functions associated with each of foregoing
	Brain Stem — midbrain (cerebral peduncles, cerebral aqueduct, substantia nigra) — pons (fourth ventricle) — medulla
	Spinal Cord *Gross Anatomy* — grey matter, white matter, central canal, dorsal root ganglion — dorsal columns, anterior median fissure — cervical and lumbar enlargements, filum terminale, cauda equina — extent of cord vs dural membranes, lumbar cistern *Cord Tracts* — principal motor and sensory tracts *Reflexes* — reflex mechanisms
1	**SECOND MIDTERM EXAMINATION** **(March 4, 2004)**
	Meningeal Protection *Roles of CSF* *Meningeal Membranes* — dura, venous sinuses, arachnoid and subarachnoid space, CSF cisterns, pia *CSF Production and Circulation* — choroid plexus, ependyma, ventricles, medial and lateral foraminae, arachnoid villi

No. of Hours	Description
	Peripheral Nervous System: ***Spinal vs Cranial Nerves*** — olfactory and optic vs all others ***PNS*** — 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)
8	**Cardiovascular System and Lymphatics**
	Cardiovascular System *Background* — the body's fluid compartments; water, ionic, and osmotic distributions *Blood* — plasma composition and functions — erythrocytes, formation and destruction — specific leukocytes — platelets — hemopoiesis *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 *Heart* — location, pericardial sac, myocardium, endocardium — atria, ventricles, valves, pacemaker and conduction system — cardiac cycle: electrical and mechanical events, the ECG *Fetal Circulation* — brief description — changes at birth *Lymphatics* — functions — lymph node/nodules, distribution and function — major lymphatic vessels, lymph circulation