



Introductory Human Anatomy and Physiology 1 – BIOL 181

University Studies Program

Course Outline

COURSE IMPLEMENTATION DATE: September 2007
OUTLINE EFFECTIVE DATE: September 2015
COURSE OUTLINE REVIEW DATE: April 2020

GENERAL COURSE DESCRIPTION:

This course is an introduction to the structural and functional aspects of the human musculoskeletal, cardiovascular, and respiratory systems.

Program Information: This course is required for the first year of the Bachelor of Science in Nursing Program.

Delivery: BIOL 181 is presented in a lecture-lab format. The physiology portion of the course is primarily taught during the lecture portion while the anatomy and application portion of the course is dealt with during the laboratory periods.

COTR Credits: 3

Hours for this course: 90 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	45
Seminars / Tutorials	
Laboratory / Studio Hours	45
Practicum / Field Experience Hours	
Other Contact Hours	
Total	90

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	N/A
Formal Work Experience	N/A
Other	N/A
Total	

Course Outline Author or Contact:

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Signature

APPROVAL SIGNATURES:

Department Head

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Department Head Signature

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EDCO

Valid from: September 2015 – April 2020

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: Biology 12 or BIOL 090 or BIOL 101/102 or KNES 190

Corequisites: None

Flexible Assessment (FA):

Credit can be awarded for this course through FA

Yes No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio, Challenge Exam. Contact an Education Advisor for more information.

Transfer Credit: For transfer information within British Columbia, Alberta and other institutions, please visit <http://www.cotr.bc.ca/Transfer>.

Students should also contact an academic advisor at the institution where they want transfer credit.

Prior Course Number: N/A

Equivalent Course: Students who have received COTR credit for HKIN 200 may not receive additional credit for BIOL 181.

Textbooks and Required Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

Marieb, E.N. and Hoehn, K., *Human Anatomy & Physiology*, 2013, 9th Edition, Pearson.

BIOLOGY 181 Lab Manual Available in the College Bookstore

Please see the instructor's syllabus or check COTR's online text calculator http://www.cotr.bc.ca/bookstore/cotr_web.asp?IDNumber=164 for a complete list of the currently required textbooks.

LEARNING OUTCOMES:

University Studies at the College of the Rockies allow students to complete their first two years of study towards a university degree. College students gain academic knowledge and skills in their chosen subjects. They also cover general problem-solving and critical thinking skills. The combination can empower them to participate as educated citizens in the economic, political, and cultural life of their communities.

Upon the successful completion of this course, students should be able to

- understand and use anatomical and physiological terminology;
 - demonstrate a basic understanding of specific components of the human body on a structural and functional level;
 - identify the various components of the skeletal system and understand anatomical & physiological knowledge of bones, joints and joint structures;
 - identify the main muscles of the human body, their origin, insertion and their action on the human body, and understand the cellular kinetics and mechanics of skeletal muscle;
 - identify the various components of the circulatory system, and understand the cardiac conduction system and vascular anatomy & physiology; and
 - identify the various components of the respiratory system and understand the mechanics and regulation of ventilation and gas exchange.
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COURSE TOPICS:

1. ORGANIZATION OF THE BODY

Levels of Structural Organization

Maintaining Life

Homeostasis

The Language of Anatomy

- Anatomical Position and Directional Terms
- Regional Terms
- Body Planes and Sections
- Body Cavities and Membranes

Structure and Function of Cells

Histology

- Basic Characteristics
- Definition
- Epithelial Tissue
- Connective Tissue
- Nervous Tissue
- Muscle Tissue
- Tissue Repair

Structure and Function of Skin

2. COVERING, SUPPORT & MOVEMENT OF THE BODY

A. Bones & Skeletal Tissues

Functions of the Bones

Classification of Bones

Bone Structure

- Gross Anatomy
- Microscopic Structure of Bone
- Bone Markings
- Chemical Composition of Bone
- Bone Development (Osteogenesis)
- Endochondral Ossification
- Intramembranous Ossification
- Physiological Control of Bone Formation/Maintenance
- Bone Homeostasis: Remodeling and Repair
- Bone Remodeling
- Repair of Fractures
- Introduction to Bone Disorders

B. Joints

Introduction to Articulations

- Structural and Functional Classification of Joints

Fibrous Joints

Cartilaginous Joints

Synovial Joints

- General Structure and Characteristics
- Types of Synovial Joints
- Introduction to Synovial Joint Injuries

C. Muscles and Muscle Tissue

Functions of Muscle Tissue

Muscle Types

Skeletal Muscle

- Gross Anatomy of Skeletal Muscle Tissue
- Microscopic Anatomy of a Skeletal Muscle Fiber
- Contraction of a Skeletal Muscle Fiber
- How Muscles Respond to Stimuli
- The Molecular Basis of Muscle Contraction
- Regulation of Contraction
- Contractions of Skeletal Muscle
- Motor Unit
- Muscle Twitch/Tension

- Muscle Tonus
- Types of Skeletal Muscle Fibers
- Muscle Metabolism
- Energy Storage
- Muscle Fatigue
- Force, Velocity and Duration of Muscle Contraction
- Force of Contraction
- Muscle-joint Lever Actions
- Muscular Dystrophy, Atrophy and Hypertrophy
- Thermoregulation
- Hypothermia
- Hyperthermia
- Smooth Muscle
- Microscopic Structure
- Contraction
- Introduction to Muscle Disorders

3. THE CARDIOVASCULAR SYSTEM

A. The Heart

Size, Location and Orientation

- Coverings
- Heart wall
- Chambers & Associated Vessels
- Pathway of Blood
- Coronary Circulation
- Heart Valves
- Properties of Cardiac Muscle
- Microscopic Anatomy
- Mechanism and Events of Contraction
- Energy Requirements
- Cardiac Physiology
- Electrical Events and the Cardiac Cycle
- Electrocardiography
- Heart Sounds
- Cardiac Output
- Regulation of Stroke Volume
- Preload: Degree of Stretch
- Afterload: Back Pressure
- Regulation of Heart Rate
- Introduction to Cardiac Disorders

B. Blood Vessels

Blood Vessel Structure and Function

Physiology of Circulation

- Introduction to Blood Flow, Blood Pressure and Resistance
- Systemic Blood Pressure
- Factor Influencing Blood Pressure
- Regulation of Blood Pressure

Circulatory Pathways: Blood Vessels of the Body

Fetal Circulation

Introduction to Vascular Disorders

C. Blood

Composition and Functions of Blood

Cellular Phase

- Erythrocytes
- General Structural and Functional Characteristics
- Production of Erythrocytes
- Regulation of Erythropoiesis
- Fate and Destruction of Erythrocytes
- Leukocytes
- General Structural and Functional Characteristics
- Types
- Platelets
- Liquid Phase
- Components of Blood Plasma

Hemostasis

Introduction to Blood Disorders

D. The Lymphatic System

Structure and Function

4. THE RESPIRATORY SYSTEM

Functional Anatomy of the Respiratory System

Mechanics of Breathing

- Respiratory Muscles
- The Respiratory Reflex
- Control of Respiration
- Spirometry
- Respiratory Volumes and Capacities
- Pulmonary Function Tests
- Alveolar Ventilation Role

Gas Exchange in the Body

- Basic Properties of Gases
- Composition of Alveolar Gas
- Gas Exchange Between the Blood, Lungs and Tissues
- Transport of Respiratory Gases

Introduction to Respiratory Disorders

LAB PROGRAM

Lab 1: Histology: the study of tissues

Lab 2: Anatomical positions, planes and the axial skeleton

Lab 3: The appendicular skeleton

Lab 4: Articulations

Lab 5: The cardiovascular system

Lab 6: Anatomical and physiological aspects of respiration

Lab 7: Hematology

Lab 8: Muscles I - muscles of the torso, neck and head

Lab 9: Muscles II – muscles and associated structures of the leg and arm

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

ESSENTIAL SKILLS DEVELOPED IN THIS COURSE:

Students can expect to develop the following skills in this course:

Skills for Busy Students

- Manage study time effectively
- Recognize personal learning style
- Use effective note-taking strategies
- Practice strategies to succeed at exams and tests

Research Skills

- Use database search and evaluate the information by comparing with Internet sources

EVALUATION AND ASSESSMENT:

Assignments	% Of Total Grade
Midterm 1	15%
Midterm 2	15%
Lab Exam 1	15%
Lab Exam 2 (cumulative)	25%
Final Exam (cumulative)	<u>30%</u>
Total	100%

Please see the instructor's syllabus for specific classroom policies related to this course, such as details of evaluation, penalties for late assignments and use of electronic aids.

EXAM POLICY:

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled exam without approval will be given a grade of "0" for the exam.

COURSE GRADE:

Course grades are assigned as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Mark (Percent)	≥ 90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	< 50

A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses. Nursing students must achieve a grade of C or better in BIOL 181 in order to be eligible for, or continue in, the BSN program.

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

COURSE CHANGES:

Information contained in course outlines is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational, employment and marketing needs. The instructor endeavours to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.