BI 121 Anatomy and Function I
4 Credits
College Now/CTE
Student Outcome Checklist
cocc.edu/departments/college-now

Student's Name_____

Student's Signature_____ **Completion Date** _____

High School Teacher's Signature _____

Recommended Letter Grade _____**High School** _____

COCC Review Instructor's Signature _____

COURSE DESCRIPTION: Covers body organization, the cell, skin, blood, heart and circulation, immunity, respiration, bones and skeletal muscles. Designed for pharmacy technicians, medical assisting and massage therapy programs. Lecture and lab are taken simultaneously; they are not offered as separate classes. Preserved animal tissues are used in some labs.

BI 121 and BI 122 are NOT courses approved for the AAOT, AS, AAS or AGS degrees offered by COCC, and cannot be used as science courses to meet the General Education Discipline Studies requirement. BI 121 and BI 122 are designed for massage therapy, medical assisting and pharmacy technician certificate programs, but can be applied towards a massage therapy AAS degree.

RECOMMENDED TEXT: *Understanding Human Anatomy and Physiology* (5th ed) by Sylvia Mader. (Other texts must be approved by COCC review instructor Emma Chaput, 541-383-7291, echaput@cocc.edu.) Lab Guides may be obtained from COCC review instructors, or an approved lab book may be used.

TEACHER REQUIREMENTS: High school teachers will meet with COCC instructor, Emma Chaput, to review the course objectives, sample problems and testing procedures. In addition, high school teachers will complete the teacher approval process and have a current articulation agreement with COCC prior to registering students.

COURSE OUTCOMES:
Upon completion of the Anatomy and Function I, students will be able to:

1. Demonstrate a fundamental understanding of human anatomy and physiology with an emphasis on cellular, integumentary, circulatory, immune, respiratory, skeletal and muscular systems.
2. Demonstrate an understanding of relationships within and between organ systems.
3. Develop a continuing curiosity about the human body, and an ability to apply scientific tools to lifelong exploration and learning.
4. Make connections between anatomy and physiology knowledge and diseases.

ADDITIONAL LEARNING GOALS

1. Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models and solutions and generate further questions;
2. Apply scientific and technical modes of inquiry, individually, and collaboratively, to critically evaluate existing or alternative explanations, solve problems, and make evidence-based decisions in an ethical manner; and
3. Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.

EXAMS: Contact the College Now office at CollegeNow@cocc.edu or 541.504.2930. If using these specific exams or questions for your course, please be certain not to allow students to keep them or to make copies. Use them only in the classroom, under supervision.

GRADING: A, A-, B+, B, B-, C+, C, D, F.
See College Now Grading Policy.

GRADING SCALE:

A	= 93-100%	C+	= 78-79%
A-	= 90-92%	C	= 70-77%
B+	= 88-89%	D	= 60-69%
B	= 83-87%	F	= 59% and below
B-	= 80-82%		

***SUGGESTED* GRADE CALCULATIONS**:
75% of grade (300 points) from three 100 point lecture exams and assignments.
Final lecture exam should have a strong emphasis on the material covered since the previous exam, but with a cumulative component.

25% of grade (100 points) from lab quizzes and lab exercises.
Three practical quizzes, each worth 25 points, with a total score of 75 points.
Graded lab exercises, with a total score of 25 points.

Extra Credit: There may be extra credit assignments during the term, worth no more than 20 points total.

COURSE COMPLETION: The high school teacher will send the following documents to: College Now Office, Central Oregon Community College, 2600 NW College Way, Bend, OR 97703.

1. A completed and signed final grade roster for the course.
2. A completed and signed copy of the Student Outcome Checklist pages 1 and 3.

BI 121 Anatomy and Function I
College Now/CTE
***Suggested* Final Grade Computation**

400 POINTS POSSIBLE.

- 300 points from three 100 point lecture exams
- 100 points from lab quizzes and lab exercises
- 20 points maximum from extra credit assignments

EXAMS (300 Pts)	POINTS		WEIGHT		POINTS
Exam #1	_____	x	25%	=	_____
Exam #2	_____	x	25%	=	_____
Exam #3	_____	x	25%	=	_____
QUIZZES AND LAB (100 Pts)	_____	x	25%	=	_____
EXTRA CREDIT ASSIGNMENTS (20 points max)				=	_____
Total Points:					_____
Recommended Letter Grade:					_____ Enter here and on page 1

_____ _____
High School Teacher Signature Date

Metrics and anatomical terms Lec: 3 hours/Lab: 2 hours

- Relate metric measurements for length, volume, weight and temperature to traditional units.
- Know the definition of the anatomical position.
- Know the anatomical terms for body regions, serous membranes, and body planes.
- Define homeostasis and understand negative feedback.

CELLS Lec: 2.5 hours/Lab: 2 hours

- Understand the structure and function of the lipid bi-layer plasma membrane of cells.
- Identify internal cell organelles in illustrations, and know their basic functions.
- Define diffusion, osmosis, and active transport.
- Understand phagocytosis ("microbe - and debris-eating"), particularly in relation to phagocytic white blood cells like neutrophils and macrophages.
- Describe the stages of mitosis and cell division: prophase, metaphase, anaphase, and telophase and cytokinesis.

TISSUES Lec: 1.5 hours

- Know the four tissue-types in the human body: epithelium, connective tissue, muscle tissue and nervous tissue.
- Relate epithelium's constant mitosis to its vulnerability to radiation.
- Know that muscle cells and nerve cells in adults do not replicate, which makes recovery from a heart attack or a stroke difficult.
- Know that most cancers arise from epithelia and connective tissue because these tissues continue to divide in adulthood.

SKIN – the Integumentary system Lec: 2 hours

- List the functions of skin, including production of vitamin D, and know the function of vitamin D in facilitating calcium uptake from the gut.
- Understand that the 2 primary tissues of skin are the epidermis on the surface and the dermis underneath it.
- Describe the layers of the epidermis, how it "waterproofs" internal tissues by a glycolipid and mechanically-protects underlying tissues with a hard protein called keratin. Understand its constant turnover of cells, and describe how the epidermis' outermost surface (the stratum corneum) is composed of dead cells.
- Know the differences between thin and thick skin, including that hair is only seen in thin skin.
- Identify and describe the functions of sebaceous glands and (eccrine) sweat glands.
- Describe melanin production by melanocytes, and relate it to skin color, UV rays, vitamin D production, and the prevention of skin cancer.
- Describe the structure and function of the dermis, including collagen and elastin fibers.
- Understand how burns are classified by degree, and explain the pathology of severe burns.

BLOOD Lec: 1.5 hours/Lab: 2 hours

- Describe the fluid and formed-element (blood cells and platelets) components of blood.

- Understand the role of blood albumin, and how lack of it results in edema and ascites.
- Describe the role and life cycle of erythrocytes.
- Explain how erythrocytes are measured by hematocrit or RBC count, and describe the different types of anemias.
- Explain the function of hemoglobin and its vulnerability to carbon monoxide.
- Recognize and explain the functions of neutrophils and lymphocytes.
- Understand the roles of platelets in blood-clotting. Understand how heparin and coumadin interfere with coagulation.
- Explain the ABO and Rh factor blood type markers, permissible transfusion combinations and transfusion reactions.
- Describe hemolytic disease of the newborn and explain how Rhogam® prevents it.

HEART Lec: 3 hours/Lab: 2 hours
- Describe the anatomy of the heart and its chambers and valves. Explain the differences between the right and left sides of the heart.
- Trace the flow of blood through the heart and its systemic and pulmonary circuits.
- Describe ventricular systole and diastole.
- Relate heart sounds to valve action.
- Describe the heart's conduction system and what it accomplishes.
- Interpret normal electrocardiogram tracings.
- Identify the coronary arteries. Describe myocardial infarction and ventricular fibrillation. Understand current treatments for a heart attack.
- Understand congestive heart failure.

CIRCULATION Lec: 1.5 hours/Lab: 2 hours
- Describe the structural and functional features of arteries, capillaries, veins.
- Know how to measure blood pressure. Explain the causes of hypertension.
- Explain arterial aneurysms and varicose veins.
- Define circulatory shock, its signs and its causes.

LYMPHATIC-IMMUNE SYSTEM Lec: 5.5 hours/Lab: 2 hours
- Describe the anatomy and function of lymph vessels and lymph nodes and define edema.
- Describe the locations and functions of the thymus gland and spleen.
- Describe how the following protect against infection: skin, acid barriers, mucus, normal flora, fever, inflammation, and the roles of the various white blood cells.
- Explain the differences between passive and active immunity.
- Explain the role of helper T lymphocytes. Describe the pathology of AIDS.
- Explain the pathology of allergy, asthma and anaphylactic shock.
- Define autoimmune disease, and give examples.

RESPIRATORY SYSTEM Lec: 2.5 hours/Lab: 2 hours

- Describe the anatomy of the respiratory system.
- Describe speech production and define the Valsalva's maneuver.
- Describe the involvement of bronchioles in asthma and anaphylactic shock.
- Explain surface tension, the role of surfactant in alveoli, and respiratory distress syndrome.
- Describe inspiration and expiration and their control by the Inspiratory Center in the medulla.
- Relate origin of the phrenic nerves to spinal cord injuries.
- Describe the importance of carbon dioxide levels to breathing rate.
- Explain the pleural vacuum during the breathing cycle and understand pneumothorax.

SKELETAL SYSTEM Lec: 2 hours/Lab: 2 hours

- Describe the functions of bones, including hematopoiesis in red bone marrow.
- Identify some of the major bones.
- Describe long bone structure and growth, including epiphysis plates. Explain the pathology of gigantism, acromegaly, and pituitary dwarfism versus achondroplasia.
- Describe ossification and explain bone remodeling by osteoblasts and osteoclasts.
- Explain bone's dependence on gravity and weight-bearing exercise.
- Know the risk factors for osteoporosis and how to prevent it. Explain pathologic fractures and kyphosis.
- Describe the structure and function of bursae near bone surfaces.
- Understand the components of a synovial joint and know the basic structure of the shoulder joint, the hip joint, and the knee joint. Also understand some of the common knee injuries.

SKELETAL MUSCLE Lec: 3 hours/Lab: 2 hours

- Describe skeletal muscle structure and the sliding filament mechanisms including the roles of calcium and ATP. Explain striations, cross-bridges and how a muscle fiber contracts, and rigor mortis.
- Summarize the difference between aerobic and anaerobic pathways for the production of energy required for muscle contractions.
- Describe what happens in neuromuscular junctions, including the roles of acetylcholine and acetylcholinesterase.
- Define motor units and muscle tone.
- Compare slow, intermediate and fast muscle fibers.
- Know the names and actions of some major skeletal muscles.