Washtenaw Community College Comprehensive Report

BIO 102 Human Biology
Effective Term: Winter 2018

Course Cover

Division: Math, Science and Engineering Tech
Department: Life Sciences
Discipline: Biology
Course Number: 102
Org Number: 12110
Full Course Title: Human Biology
Transcript Title: Human Biology
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Three Year Review / Assessment Report
Change Information:
Consultation with all departments affected by this course is required.
Outcomes/Assessment
Objectives/Evaluation
Other:
Rationale: Make changes to the assessment plans and course objectives.
Proposed Start Semester: Winter 2018
Course Description: In this course, students will become familiar with the structures and functions of the human body, recent advances in human genetics, human health and disease, elements of a healthy lifestyle, human reproductive technology and human evolution. Students apply this information as they gain an understanding of human biology and how they can contribute to their own health. The laboratory portion focuses on human structure and function using models, dissections, demonstrations and medical equipment.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 45 **Student:** 45
Lab: Instructor: 45 **Student:** 45
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

General Education

MACRAO

MACRAO Science & Math

MACRAO Lab Science Course

General Education Area 4 - Natural Science

Assoc in Applied Sci - Area 4

Assoc in Science - Area 4

Assoc in Arts - Area 4

Michigan Transfer Agreement - MTA

MTA Lab Science

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify parts of the human cells and their function and recognize concepts related to cell chemistry, cellular energetics and homeostasis.

   Assessment 1

   Assessment Tool: Set of common questions used on exams in all sections
   Assessment Date: Winter 2019
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All
   How the assessment will be scored: Item analysis of questions from unit exams using an answer key
   Standard of success to be used for this assessment: 70% of students will score at least 70%.
   Who will score and analyze the data: Department faculty

2. Recognize the main parts of each of the 11 human organ-systems, the main function(s) of each part and the main disorders that affect each organ-system. Recognize how these diseases change normal function. Recognize current means of diagnosis and treatment for these systems.

   Assessment 1

   Assessment Tool: Set of common questions used on exams in all sections
   Assessment Date: Winter 2019
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All
   How the assessment will be scored: Item analysis of questions from unit exams using an answer key
   Standard of success to be used for this assessment: 70% of students will score at least 70%.
   Who will score and analyze the data: Department faculty

3. Recognize specific healthy lifestyle choices that can affect the normal functioning of the human body and how these choices relate to the presence of specific diseases.

   Assessment 1

   Assessment Tool: Set of common questions used on exams in all sections
   Assessment Date: Winter 2019
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All

How the assessment will be scored: Item analysis of questions from unit exams using an answer key
Standard of success to be used for this assessment: 70% of students will score at least 70%.
Who will score and analyze the data: Department faculty

4. Solve simple human genetic problems. Recognize current concepts in human genetics.
   Assessment 1
   Assessment Tool: Set of common questions used on exams in all sections
   Assessment Date: Winter 2019
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All
   How the assessment will be scored: Item analysis of questions from unit exams using an answer key
   Standard of success to be used for this assessment: 70% of students will score at least 70%.
   Who will score and analyze the data: Department faculty

5. Recognize current advances in human reproductive technology.
   Assessment 1
   Assessment Tool: Set of common questions used on exams in all sections
   Assessment Date: Winter 2019
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All
   How the assessment will be scored: Item analysis of questions from unit exams using an answer key
   Standard of success to be used for this assessment: 75% of answers correct for each outcome.
   Who will score and analyze the data: Department faculty

6. Recognize proper use of laboratory equipment such as the microscope. Recognize laboratory practices, such as dissection, measurement, careful observation and analysis of experiments and the use of the scientific method.
   Assessment 1
   Assessment Tool: Lab worksheets which include short answers, matching, diagram labeling and multiple choice questions
   Assessment Date: Winter 2019
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: Random sample of 10 students from each section
   How the assessment will be scored: Item analysis using an answer key
   Standard of success to be used for this assessment: 70% of students will score at least 70%.
   Who will score and analyze the data: Department faculty

Course Objectives

1. Cells, Chemistry, Energetics, and Homeostasis - Recognize the parts of a cell and their function. Identify the symbols for common atoms found in cells and recognize the formulas for common biological molecules. Define isotope, and list some medical uses for this type of atom. Define ion, list its functions in a cell. Recognize the importance of "electrolyte balance" in the human organism. Identify what is being measured by an EKG and an EEG. Recognize the meaning of "physiological pH" and its relationship to healthy cells/organisms. Recognize the role of buffers in maintaining pH. Recognize the structure and functions of the molecules that make up the food that we eat: carbohydrates, fats, proteins, nucleic acids, vitamins, minerals, water.
2. Cells, Chemistry, Energetics, and Homeostasis continued - Recognize how cells make ATP by

oxidative respiration and lactic acid fermentation. Identify what is meant by a food calorie and specify which food types have the most and the least calories.

3. Cells, Chemistry, Energetics, and Homeostasis continued - Recognize the concept and importance of homeostasis and the role of negative feedback loops in the maintenance of homeostasis.
4. Integumentary System - Recognize levels of organization from atoms up to an entire organism. List the three main layers of the skin and the functions of each layer. Identify changes occurring in normal skin structure and function as a consequence of common diseases or injuries.
5. Skeletal System - List the general functions of the skeletal system. Name selected bones in the axial skeleton. Differentiate between yellow marrow and red marrow in terms of function and location within the bones. Identify key steps in the development and growth of long bones and bones in the skull. Recognize factors affecting remodeling of bone. Draw the structure of a movable joint and label its parts. Recognize changes that occur in skeletal system structure and function in common diseases affecting this organ system.
6. Muscular System - Identify the structure and location of the three types of muscle tissue by observing laboratory slides, draw each type. List 4 functions of muscle tissue. Define the actions of flexion, extension, abduction, rotation and the action of antagonistic muscles. Identify the name, location and action of selected skeletal muscles. Recognize how nerves innervate muscles. Explain what changes occur in muscle system function in common diseases affecting this organ system.
7. Endocrine System - Define endocrine gland and hormone. Identify how negative feedback controls our endocrine system, and identify the role of the hypothalamus, pituitary gland, peripheral endocrine gland, and target organs in this process. Identify the location, hormone(s) secreted, and main functions of selected endocrine glands. Explain what changes (symptoms) occur in normal homeostatic body control in common disease conditions involving endocrine glands.
8. Nervous System/ Sensory Systems - Identify the difference between the central nervous system and the peripheral nervous system. Identify the main subdivisions of each. Identify the functions of the sympathetic and parasympathetic systems. Recognize the difference between a neuron and a nerve. Identify the function of the myelin sheath and the neurilemma. Recognize what is meant by a nerve "impulse." Recognize how impulses are conducted down a neuron and across the synapse. Identify 2 ways to stop an impulse after it is sent across a synapse. Identify the role of selected neurotransmitters.
9. Nervous System/ Sensory Systems continued - Recognize how selected drugs work at the synapse. Identify the function of the meninges. Recognize the main parts of the brain and their specific functions in homeostasis, thought and behavior. Identify clinical and biological features (when known) of common mental health disorders. Identify how the brain controls the endocrine system. Identify how the semi-circular canals affect the cerebellum.
10. Nervous System/ Sensory Systems continued - Identify the anatomical and functional basis of the special senses. Recognize the changes that occur in normal eye or ear function in common diseases affecting these organs.
11. Digestive System - Identify the main organs and their functions of the human digestive system, including important sphincters and accessory organs. Identify the value of common diagnostic tests involving the digestive system.
12. Digestive System continued - Identify the changes that occur in normal digestive system functions in common diseases affecting this system.
13. Blood/Cardiovascular/Immune System - Identify the different parts of whole blood and the function of each part. Identify where erythrocytes and leukocytes are initially made, their normal numbers, lifespan and disposal. Identify steps in the inflammatory response. Differentiate between the functions of B cells and T cells. With respect to AIDS, recognize the cause, how it is transmitted and current clinical treatment of HIV infection. Identify the connection of allergies and anaphylaxis to an immune response.
14. Blood/Cardiovascular/Immune System continued - Recognize the difference between arteries, veins and capillaries, lymph vessels and lymph nodes and the function of each. Draw a diagram of the parts of the heart and trace the path of blood through the heart. Trace the conduction system of the heart

and its relationship to the EKG. Define and correctly measure pulse and blood pressure. Trace the cardiac circulation to the heart muscle and identify its function.

15. Blood/Cardiovascular/Immune System continued - Recognize hypertension, atheroscleosis, stroke (CVA), aneurysm, angina and heart attack (MI) with respect to symptoms, treatment and prevention. Identify the cause of varicose veins, hemorrhoids and DVT. Recognize differences between a fetal heart and a normal adult heart.
16. Respiratory System - Identify the main jobs of the respiratory system, why your cells need oxygen and why they produce carbon dioxide. Identify the main parts and functions of the respiratory system. Recognize the steps involved in inspiration and expiration. Identify the normal breathing rate and how exercise and hyperventilation affect this rate.
17. Respiratory System continued - Recognize changes in the function of the respiratory system in the following conditions: COPD and chronic smoking.
18. Excretory System - Identify 4 main organs of excretion, the wastes excreted by each and from what metabolic processes these wastes arise. Recognize organs in the male and female urinary system. Recognize changes in renal function in selected common renal diseases. Identify when kidney dialysis is used.
19. Reproductive System/Embryology/STDs/Reproductive Technology - Label the male and female organs of reproduction on a diagram and list the functions of each organ. Identify the male hormone and the 2 female hormones, recognize where they are formed and some functions of each. Identify the source and function of HCG. Identify differences between meiosis and mitosis with respect to where and when each occurs, purposes of each and steps in each process.
20. Reproductive System/Embryology/STDs/Reproductive Technology continued - Identify the most probable site of fertilization in the female reproductive system. Recognize the structures, hormones and timing involved in the menstrual cycle and its purpose. Identify current methods of contraception available to a male and to a female.
21. Reproductive System/Embryology/STDs/Reproductive Technology continued - . Differentiate between embryonic stem cells, adult stem cells and umbilical cord stem cells. Recognize procedures and applications of Prenatal Genetic Diagnosis. Recognize the stages from fertilization through cleavage, time of implantation, early embryo and fetus, identifying the changes that occur in each stage and the timeline involved.
22. Reproductive System/Embryology/STDs/Reproductive Technology continued - Differentiate between the primary and secondary sexual characteristics in girls and boys. Recognize current scientific thoughts concerning sexual and gender identity. Identify the cause, mode of transmission, symptoms, treatment and prevention of selected sexually transmitted diseases.
23. Human Genetic and Current Genetic Technology - Identify the relationships between a chromosome, DNA molecule, gene and protein. Identify the number of chromosomes in each human cell, how many we pass on and how that occurs. Solve simple crosses, involving dominant and recessive genes, distinguishing between crosses that involve autosomal and those that involve X- or Y-linked genes.
24. Human Genetic and Current Genetic Technology continued - Recognize the concept of genetic disease. Read a pedigree chart (family tree). Construct a family tree when given genetic information about a family. Recognize why X-linked diseases are more prevalent in males.
25. Human Genetic and Current Genetic Technology continued - Recognize genetic, environmental, and infectious causes of cancer.
26. Human Evolution - List the main principles in classical Darwinian evolution. Identify how the fossil record has recorded evolutionary history. Recognize selected extinct relatives of Homo sapiens.
27. Laboratory - Identify each part and its function for the light microscope and demonstrate proper usage and care. Demonstrate the correct technique in handling and viewing prepared slides; make a wet mount slide and measure objects under the microscope.

New Resources for Course

Course Textbooks/Resources

Textbooks

Mader, S.. *Human Biology Custom*, 13 ed. McGraw Hill, 2014, ISBN: 9781121702134.

Manuals

Schindler, M., & Anderson, D. et al. Lab Manual for Human Biology, Washtenaw Community College, 01-01-2017

Periodicals

Software

Equipment/Facilities

Level III classroom

Reviewer	Action	Date
Faculty Preparer:		
Anne Heise	*Faculty Preparer*	*Apr 17, 2017*
Department Chair/Area Director:		
Anne Heise	*Recommend Approval*	*Apr 17, 2017*
Dean:		
Kristin Good	*Recommend Approval*	*Apr 17, 2017*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*Sep 05, 2017*
Assessment Committee Chair:		
Michelle Garey	*Recommend Approval*	*Sep 11, 2017*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Sep 11, 2017*