BIO-105L: HUMAN BIOLOGY LABORATORY

Cuyahoga Community College

Viewing: BIO-105L : Human Biology Laboratory

Board of Trustees:
October 2018

Academic Term:
Fall 2019

Subject Code
BIO - Biology

Course Number:
105L

Title:
Human Biology Laboratory

Catalog Description:
Laboratory course designed for non-science majors that examines the microscopic and gross structure and function of the human body. Includes microscope work, models, animal dissections, and various experiments designed to illustrate concepts related to basic human biology and to complement topics covered in BIO-1050 Lecture course.

Credit Hour(s):
1

Lecture Hour(s):
0

Lab Hour(s):
3

Other Hour(s):
0

Requisites

Prerequisite and Corequisite
ENG-0990 Language Fundamentals II or appropriate score on English Placement Test. Concurrent enrollment in BIO-1050 Human Biology is strongly recommended.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.

II. ACCESSIBILITY STATEMENT

If you need any special course adaptations or accommodations because of a documented disability, please notify your instructor within a reasonable length of time, preferably the first week of the term with formal notice of that need (i.e. an official letter from the Student Accessibility Services (SAS) office). Accommodations will not be made retroactively.
For specific information pertaining to ADA accommodation, please contact your campus SAS office or visit online at http://www.tri-c.edu/accessprograms. Blackboard accessibility information is available at http://access.blackboard.com.

III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status.

Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Tri-C is responsible for identifying students who have not attended a course before financial aid funds can be applied to students’ accounts.

Therefore, attendance is recorded in the following ways:
- For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
- For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have “Never Attended” a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available athttp://www.tri-c.edu/student-resources/documents/studenthandbook.pdf. You must also comply with the College’s Zero Tolerance for Violence on College Property available at http://www.tri-c.edu/policies-and-procedures/documents/3354-1-20-10-zero-tolerance-for-violence-policy.pdf

Outcomes
Course Outcome(s):
Apply the process of scientific inquiry to develop and explore questions about human anatomy and physiology, and effectively communicate the findings.
Objective(s):
1. State the steps of the scientific method.
2. Distinguish among an observation, hypothesis, experiment, conclusion, and theory.
3. Distinguish between observations and inferences.
4. Use a scientific inquiry to write a hypothesis, design an experiment, analyze data and draw conclusions.
5. Document experimental results in a written format.
6. Demonstrate appropriate lab skills and techniques in observations and experimentation.

Course Outcome(s):
Use laboratory equipment to make observations and take precise metric measurements of mass, length, volume, and temperature.

Objective(s):
1. Use a variety of tools to accurately record linear measurements.
2. Safely use common laboratory equipment to accurately measure volume.
3. Correctly use electronic balances to accurately measure mass.
4. Safely use a thermometer to accurately record temperature.
5. List, describe, and identify the functional components of a compound light and stereomicroscope.
6. Correctly use compound light and stereomicroscopes to visualize human cells and tissues.

Objective(s):
Analyze the chemical building blocks that make up human cells, food, and urine.

Objective(s):
1. Describe the chemical makeup of proteins, carbohydrates, lipids, and nucleic acids.
2. Describe the reactions that occur in cells to build and break down macromolecules.
3. Conduct lab experiments that test for the presence of specific biomolecules in solutions.
4. Analyze the effects of pH, temperature, emulsification, and time on the digestion of proteins, fat, and starch.
5. Conduct experiments to analyze the chemical composition of urine and relate the results to urine formation and diseases.

Course Outcome(s):
Observe specific biophysical processes that occur in cells and explain their roles in the functions of human cells.

Objective(s):
1. Perform laboratory experiments to explain diffusion, osmosis, concentration, concentration gradient, and tonicity.
2. Differentiate between passive diffusion, facilitated transport, active transport, osmosis, and dialysis.
3. Describe the general structure and function of an enzyme.
4. Investigate factors that influence enzyme activity by conducting experiments using enzymes from cell homogenates.

Course Outcome(s):
Describe the structure and functions of human cells and relate how the structure of a cell determines its function.

Objective(s):
1. Prepare wet mount samples of living cells and view them under a compound light microscope.
2. Use photomicrographs, models, and drawings of an animal cell to identify major organelles and relate their structure to their functions.

Course Outcome(s):
Describe the structure and function of human tissues and relate how the structure of a tissue determines its function.

Objective(s):
1. Use photomicrographs, models, drawings, and microscopic observations of histological slides to identify and describe the structures of epithelial, connective, muscular, and nervous tissues.
2. Use photomicrographs, models, and drawings to state the locations of epithelial, connective, muscular, and nervous tissues in the body.
3. Use photomicrographs, models, and drawings of epithelial, connective, muscular, and nervous tissues to state their functions in the body.

Course Outcome(s):
List the eleven body systems, identify body cavities, and describe the location, structure, and function of major organs in each body system.

Objective(s):
1. Use photomicrographs, models, drawings, and animal dissections to identify and describe major body cavities.
2. Use photomicrographs, models, drawings, and animal dissections of animals to describe the location of organs of the 11 body systems of humans.
3. Use photomicrographs, models, drawings, and dissections of animals to state the function of major organs.
4. Use photomicrographs, models, drawings, and dissections of animals to describe the structure of individual organs.
5. Use photomicrographs, models, drawings, and dissections of animals to describe the path of food, blood, air, gametes, and urine through humans.

Course Outcome(s):
Measure physiological variables, state how these variables change in response to disturbances in homeostasis, and explain why the variables changed.

Objective(s):
1. Measure heart rate, blood pressure, reflex time, and respiratory volume at rest in after disturbances in homeostasis.
2. Listen to heart and lung sounds and relate the sounds to function of the organs and homeostasis.

Course Outcome(s):
Define homeostasis and explain how different organs and organ systems work together to maintain homeostasis.

Objective(s):
1. Explain how the anatomy of the lungs, liver, and kidneys contributes to homeostasis.
2. Perform experiments analyzing carbon dioxide transport and release and relate the results to homeostasis.
3. Conduct experiments analyzing glucose levels in mock solutions of blood from different blood vessels and relate the results to eating and homeostasis.
4. Perform experiments analyzing the chemical composition of bones and relate the findings to homeostasis.

Methods of Evaluation:
1. Quizzes
2. Laboratory practical examinations
3. Written reports
4. Participation in laboratory activities

Course Content Outline:
1. Scientific method
   a. Steps of the scientific method
   b. Observations
   c. Hypotheses
   d. Inferences
   e. Experimental variables
   f. Controls
   g. Indicators
2. Homeostasis
   a. Definition
   b. Negative feedback
   c. Results when disrupted
3. Measurements
   a. Length
   b. Volume
c. Mass
d. Temperature
e. Accuracy
f. Precision
4. Microscopy
   a. Parts of a compound light microscope
   b. Parts of a stereomicroscope
   c. Safety, use, and cleaning of microscopes
   d. Preparing microscopic slides
   e. Measuring field of view
   f. Measuring depth of field
5. Biological Molecules
   a. Monomers and polymers
   b. Proteins
      i. Enzymes
         1. Structure and function
         2. Measuring activity
         3. Factors that affect enzyme activity
   c. Carbohydrates
   d. Lipids
   e. Nucleic acids
   f. Dehydration and hydrolysis reactions
6. Cells
   a. Definition
   b. Microscopic identification of cells
   c. Organelles’ structures and functions
   d. Cell membrane structures and functions
   e. Cytosol structures and functions
   f. Movement across plasma membranes
      i. Diffusion
      ii. Osmosis
      iii. Facilitated transport
      iv. Active transport
   g. Structure determines function
7. Tissues’ Structures, Functions, and Locations
   a. Connective
      i. Bone
      ii. Cartilage
      iii. Ligaments
      iv. Tendons
      v. Adipose
      vi. Blood
   b. Muscular
      i. Skeletal
      ii. Smooth
      iii. Cardiac
   c. Epithelial
      i. Simple
      ii. Stratified
      iii. Apical layer
         1. Squamous
         2. Cuboidal
         3. Columnar
   d. Nervous
8. Body Systems and Major Organs
   a. Integumentary
      i. Skin
      ii. Hair
      iii. Nails
b. Skeletal
   i. Bones
   ii. Ligaments
   iii. Tendons
   iv. Cartilage

c. Muscular
   i. Major muscle groups
   ii. Sliding filament model

d. Respiratory
   i. Upper respiratory tract
   ii. Lower respiratory tract
   iii. Lungs

e. Reproductive
   i. Male reproductive tract
   ii. Female reproductive tract

f. Nervous
   i. Central nervous system
      1. Brain
      2. Spinal cord
      3. Special senses
   ii. Peripheral nervous system
      1. Cranial nerves
      2. Spinal nerves
      3. General senses


g. Cardiovascular
   i. Heart
   ii. Blood vessels
   iii. Fetal versus adult circulation

h. Lymphatic/Immune
   i. Primary immune organs
   ii. Secondary immune organs
   iii. Lymphatics

i. Urinary
   i. Kidneys
   ii. Ureters
   iii. Urinary bladder
   iv. Urethra

j. Digestive
   i. Gastrointestinal tract
   ii. Accessory organs

k. Endocrine
   i. Glands
   ii. Hormones

Resources


Instructional Services
OAN Number:
TMNS
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Key: 903