Course Title: BIO 107 Introduction to Human Biology

Course Coordinator: Barbara Davis

Prerequisites: None

Course Credits/Hours: 4 credits / 3 lecture, 3 lab

General Education: Proposed General Education Course

Course Description: BIO107, Introduction to Human Biology is a human anatomy and physiology course intended for the non-biology major. Biological principles are taught by examining human body systems, homeostasis, and disease. This information, relevant because it applies to their own bodies, will help students understand medical issues, appreciate the importance of exercise and nutrition in maintaining health, and consider environmental concerns including the health effects of pollution and overpopulation. Laboratory exercises include experimentation, microscopy, and dissection.


Student Learning Objectives

As a result of meeting the requirements in this course, students will be able to:

1. Explain the scientific and biological foundations of anatomy and physiology and the role of the
2. Describe the organization of the human body, including body symmetry, planes, directional terms, regions of the body and body cavities. Describe levels of organization in the body including cells, tissues, organs, and organ systems. Explain the concept of homeostasis.

3. Outline the principles of the Cell Theory. Identify the parts of the cell including the plasma membrane, cytoplasm, and organelles, and explain their functions. Explain how substances are transported through cell membranes. Discuss the production of energy by the cell. Describe the molecular structure of DNA and RNA. Understand the complementary nature of the strands of DNA. Demonstrate an understanding of the Central Dogma concept. Discuss the process of protein synthesis. List the stages of cell division and describe the events that occur. Understand how mutations happen. Students will learn and practice the proper use of a microscope.


5. Examine the role of the Integumentary System in covering and protecting the body, receiving sensory information, and controlling body temperature. Discuss skin cancer and acne.

6. List the functions of the Skeletal System. Describe the microscopic structure of a long bone. Identify the types of bone cells. Identify major bones in the Axial and Appendicular divisions of the skeleton. Explain types of fractures and how bone is repaired. Be familiar with common disorders of the skeletal system.

7. Outline the functions of the muscular system. Distinguish between the three types of muscle. Explain how a muscle contracts. Use correct terminology to describe the actions of muscle. Be able to identify major muscles in the body. Be able to point out major principles of exercise physiology. Explain the effects of exercise on body physiology. Be cognizant of the benefits of exercise and aware of precautions concerning exercise.

8. List the functions of blood. Describe the cells found in blood and explain their purpose. Explain the basis of human blood groups. Explain how blood coagulates. Compare disorders associated with blood including anemia and leukemia and hemophilia.

9. Describe the structure and function of arteries, veins, and capillaries. Understand disorders such as atherosclerosis and hypertension, their causes and control. Describe the functions of the Pulmonary and Systemic divisions of the circulation. Explain how blood pressure is measured.

10. Describe the structure and function of the heart. Identify the chambers of the heart and the heart valves. Explain the operation of the conduction system of the heart. Discuss the coronary vessels that supply blood to the heart. Describe the sequence of events that result in the pumping of blood by the heart. Explain how a heart attack occurs. Understand the causes and treatment of cardiac disease. Examine risk factors associated with heart disease.

11. Explain the lymphatic system structure and function and its role in defense against disease causing organisms. Demonstrate an understanding of lymphoma.

12. Recognize the importance of the Immune System in protecting us against disease. Identify the components of the immune system and investigate their roles in the immune response.
13. Demonstrate an understanding of the nature and causes of infectious disease. Provide a general classification of organisms that are responsible for causing disease. Use selected diseases as examples to explain how pathogens are transmitted, how diseases are diagnosed, and how diseases may be controlled. Realize the seriousness of current epidemics such as AIDS and emerging diseases. Discuss concerns over Biological Warfare and Bioterrorism.

14. Explain the structure and function of the components of the respiratory system. Discuss the mechanism of breathing. Describe the process of gaseous exchange in the lung and tissues. Identify common respiratory diseases and their effects. Demonstrate an awareness of the effects of smoking. Point out the harmful effects of air pollution on the respiratory system.

15. List the functions of the Urinary System. Describe the structure of the kidney. Describe the structure of the nephron and the structure of the excretory passages. Explain how urine is formed. Demonstrate an understanding of peritoneal dialysis, hemodialysis and renal transplantation.

16. Describe the structure and function of the digestive system. Explain the process of digestion. Demonstrate knowledge of the causes of selected digestive disorders and diseases including ulcers, hepatitis, and appendicitis. Describe the value of good nutrition in maintaining health and well-being. Discuss the role of carbohydrates, lipids, and protein in providing nutrition and examine the importance of vitamins and minerals in nutrition. Describe the effects of vitamin deficiencies. Explain how calories are used to measure energy. Discuss appetite and weight control. Demonstrate knowledge of Eating Disorders and the dangers of Food Contamination.

17. Identify the divisions of the nervous system. Explain the structure and function of the components of the nervous system. Describe the structure of nerves and the generation of the nerve impulse. Describe the parts of the brain and their functions. Trace the path of impulses in a reflex arc and the path that information would flow from a sensory receptor to the brain and how motor information would flow from the brain to muscle.

18. Identify the structure and function of receptors involved in the reception of general sensation including proprioceptors, pain receptors, touch receptors, pressure receptors and receptors for temperature. Discuss the structure and function of the structures responsible for the special senses of vision, hearing, olfaction, taste and equilibrium. Explore the effects of drugs on the mind including caffeine, nicotine, and alcohol. Consider the effect of hallucinogenic drugs. Examine the misuse of prescriptive drugs. Point out the consequences of addiction to cocaine and narcotics.

19. Investigate the role of the Endocrine System in controlling body functions. Explain what a hormone is. Explain disorders of oversecretion or undersecretion of hormones.

20. Consider the response to stress elicited by the nervous system and endocrine system.

21. Describe the structure and function of the reproductive organs. Analyze the hormonal control of the menstrual cycle and describe the progression of the cycle. Discuss the process of fertilization, pregnancy and birth. Discuss sexually transmitted diseases. Explain methods used for contraception.

22. Discuss environmental problems associated with human population growth.

23. Analyze case studies and formulate differential diagnoses through online programs.
ASSESSMENT CRITERIA

Student assessment will include, at the discretion of the instructor various methods of assessment including examinations, assignments, case studies, projects, class presentations, reports and lab reports.

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Benefits of Exercise. Precautions Concerning Exercise

6. The Cardiovascular System


7. Lymphatic System, Immunity and Infectious Disease


8. The Respiratory System

Functions of the Respiratory System. The Respiratory Organs; The Nose and Nasal Cavity, Paranasal Sinuses, Pharynx, Larynx, Trachea, Bronchi, Lungs, Thoracic Cavity The Physiology of Respiration-Breathing, External respiration, Gas transport, internal respiration. Volumes of Air exchanged during Respiration, Lung capacity (optional), Control of Respiration. Respiratory Diseases-Asthma, COPD and lung cancer. The Effect of Smoking and Air Pollution.

9. The Urinary System

The Structure and Function of the Urinary System. The Structure of the Kidney-External and Internal Structure; Anatomy Microscopic Anatomy; Structure of the Nephron; Structure of the Excretory Passages. The Physiology of the Urinary System;

10. The Digestive System
The Nature of Foods: Carbohydrates, Fats, Proteins and Vitamins
The Structure of the Digestive System-Alimentary Canal; Mouth and Associated Structures, Pharynx, Esophagus, Stomach, Small Intestine, Large Intestine.
Accessory Glands-Salivary Glands, Liver, Pancreas. The Physiology of the Digestive System- Mechanical and Chemical Digestion in the Mouth; Swallowing; Mechanical and Chemical Digestion in the Stomach. Digestion in the Small Intestine: Secretions that Enter the Small Intestine; Chemical Digestion and Absorption. Large Intestine-Absorption of Water, Microbial Action and Formation of Digestive Waste Disorders of the Digestive System including Dental Caries, Heartburn, Acid Reflux Peritonitis, Ulcers, Appendicitis, Cirrhosis, Hepatitis, Gallstones, Pancreatic Cancer and Colitis.
Nutrition and Weight Control-Hunger, Appetite, and Satiation; A Balanced Diet; Energy Content of Foods; Weight Control and Obesity Eating Disorders-Anorexia Nervosa and Bulimia. Food Contamination, Food borne Illnesses and Food Additives. Water-borne diseases and water supply.

11. The Nervous System
Divisions of the Nervous System; Cells of the Nervous System-Neuroglial Cells and Neurons; The Structure of the Neuron; The Nerve Impulse and Synaptic Transmission.
The Brain-Meninges, Cerebrospinal Fluid, Blood-brain Barrier.

The Sensory Systems

Drugs and Mind (optional)


12. The Endocrine System
Hormones and endocrine glands- Pituitary, Thyroid, Parathyroid, Pancreas Adrenal Glands, and Pineal glands and Reproductive Endocrine Organs.
Prostaglandins. Disorders of the Endocrine System.

The Physiology of Stress (Optional)
The Nature and Physiology of Stress. Stress related illnesses and the Reduction of Stress.

13. Reproduction


14. Human Population Growth


SPECIAL FEATURES OF THE COURSE:

The course may include the use of learning technologies such as PowerPoint presentations; Turnitin to prevent plagiarism; WebCT, an online platform for course delivery, discussion and assessment; classroom response systems, and internet based interactive programs, information, case studies and/or illustrations.

RESEARCH, WRITING AND EXAMINATION REQUIREMENTS:

A written research report or project is required for this course. Laboratory reports, case studies and discussions are ______________ in this course. The number and type of examinations are described below:

GRADING:

A. Unit Examinations # ...................................... ________ %
B. Laboratory Work * ...................................... _____ %
C. Report / Project ........................................... _____ %
E. Other ..................................................... _____ %

TOTAL ........................................................................... 100%

*Laboratory Grade is calculated based on
A. Laboratory Exams................................................._______%
B. Assignments/Reports/ Case Studies/Quizzes.............._______%
C. Other................................................................._______%

Grade Conversions: (Optional)
The conversion of numerical grades to letter grades is listed below:

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<th>Numerical Grade</th>
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Class Participation: The role and weight of class participation in this course is ____________________________________________________.

Late Work: The course policy on late work is ________________________.

Make-up Examination Policy: ________________________________

ATTENDANCE POLICY:

**BCC Attendance Policy:** All students are expected to attend punctually every scheduled meeting of each course in which they are registered. Attendance and lateness policies and sanctions are to be determined by the Instructor for each section of each course. These will be established in writing on the individual course outline. Attendance will be kept by the Instructor for administrative and counseling purposes.

**Course Attendance Policy and Sanctions:**________________________________________________________

**OTHER COLLEGE POLICY STATEMENTS FROM BCC CATALOG INCLUDING COURSE POLICIES WHERE APPLICABLE**

**Academic Integrity/Discipline**
Bergen Community College is committed to academic integrity – the honest, fair, and continuing pursuit of knowledge, free from fraud or deception. Students are responsible for their own work. Faculty and academic support services staff will take appropriate measures to discourage academic dishonesty. The College recognizes the following general categories of violations of academic integrity. Academic integrity is violated whenever a student does one or more of the following:

A. Uses unauthorized assistance in any academic work.
   • copies from another student’s exam
   • uses notes, books, electronic devices or other aids of any kind during an exam when doing so is prohibited
   • steals an exam or possesses a stolen copy of any exam
B. Gives unauthorized assistance to another student
   • completes a graded academic activity or takes an exam for
someone else
• gives answers to or shares answers with another student
  before or during an exam or other graded a academic activity
• shares answers during an exam by using a system of signals
C. Fabricates data in support of an academic assignment
• cites sources that do not exist
• cites sources that were not used
• submits any academic assignment which contains falsified
  or fabricated data or results
D. Inappropriately or unethically uses technological means to
  gain academic advantage
• inappropriately or unethically acquires material via the
  Internet or by any other means
• uses any devices (electronic or hidden) for communication

Plagiarism is a form of academic dishonesty and may be a violation of U.S. Copyright laws. Plagiarism is
defined as the act of taking someone else’s words, opinions, or ideas and claiming them as one’s own.
Examples of plagiarism include instances in which a student:
• knowingly represents the work of others as his/her own
• represents previously completed academic work as current
• submits a paper or other academic work for credit which
  includes words, ideas, data or creative work of others without
  acknowledging the source
• uses another author’s exact words without enclosing them in
  quotation marks and citing them appropriately
• paraphrases or summarizes another author’s words without
  citing the source appropriately

Sanctions Against a Student for a Classroom Violation
1. The faculty member must report all incidents to the Chair of the Department.
2. The faculty member in consultation with the Chair will determine the course of action to be followed.
   This may include:
   • assigning a failing grade on the assignment
   • assigning a lower final course grade
   • failing the student in the course
   • other penalties appropriate to the violation
3. The faculty member, after making a decision, must notify the Director of Student Life and Judicial
   Affairs and Vice President of Student Services of the violation and the penalty imposed.
4. The student has the right to appeal the decision of the faculty member by writing to the appropriate
   Department Head and then to the Academic Vice President.

Specific course guidelines regarding academic integrity consistent with the College policy are
__________________ (optional).

Nondiscrimination Policy from the BCC College Catalog:
It is the policy of Bergen Community College to provide access to educational programs, Services, and benefits
to all students, without regard to religion, race, color, national origin, ancestry, age, sexual orientation, marital
status, sex, disability, or veteran status, including veterans of the Vietnam era. The College complies with Title
VII of the Civil Rights Acts of 1964 and 1990, Title IX of the Education Amendments of 1972, Section 504 of
the Rehabilitation Act of 1973, the Older Americans Act of 1975, and the Americans with Disabilities Act of 1990, and the New Jersey Law Against Discrimination. Complaints or questions concerning violations of these laws and policies should be addressed to:

Raymond Welch, Manager of Training and Compliance, Bergen Community College,
400 Paramus Road, Paramus, New Jersey, 07652; 201-612-5331 (voice), 201-447-7845 (TTY), or rwelch@bergen.edu (e-mail), or to the Secretary, Department of Education, Washington, D.C. 20201.

**ACCEPTABLE USE OF BCC TECHNOLOGY**

Bergen Community College reserves the right to monitor its information technology resources and telecommunications network to protect the integrity of its computing systems, workstations, and lab facilities, and to ensure compliance with all acceptable use and related policies and procedures. To this end, the College reserves the right to inspect any and all computer systems or data that reside on its telecommunications network for violations of any acceptable use and related policies and procedures.

**Acceptable and Unacceptable Use**

Because of the richness of the Internet and the College’s information technology resources, it is not possible to catalog exhaustively all acceptable and unacceptable uses. The lists below are meant to be illustrative. Students should consult with their classroom instructors about the appropriateness of other uses. In free time areas, users should address questions to lab supervisors or other responsible parties. In deciding what is and is not an acceptable use, there are two overriding principles: (1) the College’s information technology and telecommunication resources exist to support the College’s mission, and (2) the College is committed to ensuring a positive learning environment for all members of its community. Thus, all users are obliged to demonstrate civility in any and all exchanges and postings, including the content of Web pages, both official and unofficial. The College reserves the right to remove from its telecommunications networks any content judged to be racist, pornographic, or designed to denigrate members of the College community.

**Acceptable Use**

1. Gathering and providing research material and data
2. Analyzing research data
3. Preparing course materials
4. Completing class and homework assignments
5. Enhancing coursework
6. Enhancing educational approaches and teaching methods
7. Obtaining and disseminating college related knowledge
8. Developing and administering targeted demographic surveys
9. Using WebAdvisor to register online for courses or to access information about one’s own academic performance

**Unacceptable Use**

1. Using the network for gambling, any other illegal activity, or any activity prohibited by the College’s acceptable use and related policies and procedures, including but not limited to violations of copyrights, software agreements and other contracts
2. Using the college systems for commercial or profit-making purposes
3. Altering system software or hacking in any form
4. Gaining unauthorized access to resource entities, including use of others’ passwords
5. Invading the privacy of individuals
6. Posting anonymous messages
7. Creating and displaying threatening, obscene, racist, sexist, or harassing material, including broadcasting unsolicited messages or sending unwanted mail
8. Disobeying lab and system policies, procedures, and protocols (e.g., time limits on workstation usage)
9. Using the network in support of groups outside the College when such use is not in keeping with the mission of the College
10. Creating and using individual Web pages not primarily focused on the mission of the College
11. Using WebAdvisor to access information about someone other than oneself.

STUDENT AND FACULTY SUPPORT SERVICES

The Henry and Edith Cerullo Learning Assistance Center
The Tutoring Center, English Language Resource Center, and Writing Center are collectively known as the Henry and Edith Cerullo Learning Assistance Center. The Cerullo Learning Assistance Center is located in the Pitkin Education Center, Room L-125; the telephone number is 201-447-7489.

THE TUTORIAL CENTER- The Tutoring Center, staffed with peer and professional tutors, offers free individual and group tutoring, supplemental instruction, and online tutoring for subjects offered at the College.

THE ENGLISH LANGUAGE RESOURCE CENTER is located in Ender Hall, Room 126, provides help to students whose native language is not English

WRITING CENTER-The Writing Center, located in the Learning Assistance Center L-125, is designed to help students improve their writing. Individualized tutorials in all facets of the writing process including the development of ideas, organization, editing, and proofreading are available to all students enrolled in college-level courses.

ONLINE WRITING LAB (OWL) - The Bergen Online Writing Lab (OWL) is a Web site designed to help students with all aspects of the writing process. It contains links to sites about how to generate ideas for writing, organize written ideas, write resumes and cover letters, do research papers, write papers for various college subjects, and edit and proofread papers. It can be accessed at http://www.bergen.edu/OWL

SYDNEY SILVERMAN LIBRARY
The Sidney Silverman Library, an important resource for information, study, and intellectual enrichment, is an integral part of the College’s educational programs. To support the curriculum, the library acquires, organizes, and provides access to a variety of print, media, and electronic resources for individual and classroom use. The Library entrance is located on the 2nd level of the Pitkin Education Center. The library is open seven days a week during the fall and spring semesters, and weekdays during the summer.

AMERICANS WITH DISABILITIES ACT:
Students who require accommodations by the American with Disabilities Act (ADA) can request support services from the Office of Specialized Services of Bergen Community College, 201-612-5270 or http://www.bergen.edu/pages/676.asp

Americans with Disabilities Act & Section 504 Grievance Procedures
Bergen Community College has adopted an internal grievance procedure to provide for prompt and equitable resolution of complaints alleging any action prohibited by federal regulations implementing Section 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act of 1990 (ADA). Students’ functions are generally directed toward the Office of Student Life. See page 58 in the college catalog for further details.
WEB ADVISOR
All BCC students enrolled in credit courses are entitled to a WebAdvisor account. With WebAdvisor, you may register online, check your schedule, room assignments, GPA, and find out what courses you need to take. To find out more about WebAdvisor or to sign up online, visit <http://go.bergen.edu>! While there, please make sure you give us your preferred email address. You'll find directions how to do this at <http://go.bergen.edu/email>.

COURSE POLICIES
Eating & Drinking:
Eating and drink in the classrooms, lecture halls, laboratories, and Passageways are forbidden. Eating and drinking are permitted in the cafeteria and vending areas only.

Faculty Absence:
A daily listing of cancelled classes will appear in the glass case located outside the Evening Office (L-113). Another such listing will appear in the glass case adjacent to the Hotel / Restaurant bulletin board in Ender Hall. Students can consult these cases before going to class. If students find a class cancelled which has not been listed, they should report this to the Evening Office or the Divisional Dean's office, A-325.

Laboratory Safety:
Laboratory Safety will be reviewed during the first laboratory session. Failure to abide by these rules will result in ___________________________.

WebEnhanced or Online Class: (optional)
This class is a web enhanced class which means that the classes will meet at the assigned times and be accompanied by a WebCT course which will include homework assignments, communications tools, online testing and more. You are required to log into the WebCT course at least once a week for this course. Log in information is listed below. Or This is an online class which means that ___________________________.

WebCT
Directions for logging into WebCT enhanced course

1. Go to the Bergen Homepage and enter through Online Service (bottom right)

2. You will already be entered into the class but you must enter your user name and password

   • Your username is the same username as your Webadvisor username. If you are uncertain of your username, go to http://go.bergen.edu, click on Webadvisor for Students, click on "What’s my ID?" and follow the prompts.

   • Your password will be: The first 8 letters of your last name and the last 4 digits of your social security number – up to 12 characters - (no hyphens, capitol letters or spaces) Ex: John Smith & SS# 107-35-1234 (smith1234).
COURSE OUTLINE AND CALENDAR:

Note to Students: The Course Outlines and Calendars for the lecture and laboratory are tentative and subject to change, depending on the progress of the class.

### LECTURE COURSE OUTLINE AND CALENDAR

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<td>Nervous System</td>
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<td>12</td>
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<td>Endocrine System</td>
<td>19, 20</td>
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<td>13</td>
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<td>Reproductive System</td>
<td>21</td>
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<td>14</td>
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<td>Human Population Growth</td>
<td>22</td>
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<tr>
<td>15</td>
<td></td>
<td>Review and Cumulative Final Exam</td>
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</table>

*Specific Examinations and assignment dates are included for each course

### LABORATORY COURSE OUTLINE AND CALENDAR

<table>
<thead>
<tr>
<th>Week</th>
<th>Lab Topic</th>
<th>Student Learning Objectives-Lab</th>
<th>Activity/Case Studies**/Assignments/Exams*</th>
<th>Lab Exercise #</th>
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</table>
| 1    | Introduction to Human Biology | 1, 2, 23 | *Laboratory Safety  
*Scientific Method  
*Introduction to Anatomy | Intro, 2, Handouts |
| 2 | The Structure and Function of Cells and Human Genetics | 3, 4, 23 | *Microscope  
*The Cell-Prokaryotic and Eukaryotic  
*Comparison of bacterial, animal and plant cells  
*Osmosis  
*Mitosis and meiosis  
*Human Genetics  
*Case Study | 3, 4, 5, 6 |
|---|---|---|---|---|
| 3 | Integumentary System | 5, 23 | *Tissues—epithelial, connective, muscle and nervous.  
* Skin and derivatives of skin—Structure and function  
* skin cancer and sunscreen  
*Case Study | 7 |
| 4 | Skeletal System | 6, 23 | Identify bones  
• Skull, appendicular and axial skeleton  
Articulate skeleton  
Case Study | 8 |
| 5 | Muscular System | 7, 23 | Identify major muscles  
Case study | 9 |
| 6 | Cardiovascular System | 8, 9, 10, 23 | Blood  
• Hematocrit  
• Formed elements of blood  
• Coagulation  
Cardiovascular Anatomy and Physiology  
• Heart anatomy  
• Sheep heart dissection***  
• Circulation  
• Heart physiology  
Cardiovascular Assessment  
• Heart rate and heart sounds  
• Blood pressure  
• Electrocardiogram  
Case Study | 10, 11, 12 |
| 7 | Lymphatic System, Immunity and Infectious Disease | 11, 12, 13, 23 | Lymphatic System  
• Structure and function  
Immune System  
Microorganisms in Human Biology  
• Environmental microbiology and Normal Flora  
Case Study | 1, Handouts |
| 8 | Respiratory System | 14, 23 | Respiratory System  
• Anatomy  
• Physiology-vital capacity, spirometry  
Case Study | 11 |
| 9 | Urinary System | 15, 23 | Urinalysis  
Renal Anatomy and histology | 13 |
<table>
<thead>
<tr>
<th>Course</th>
<th>Topic</th>
<th>Exams</th>
<th>Case Study</th>
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</table>
| 10     | Digestive System | 16, 23 | Chemical Action of Digestion  
Anatomy of Digestive System  
• Rat dissection***  
Energy Budget  
• Calorie and energy expenditure  
• Basal metabolic rate  
• Body composition  
Case Study | 14, 15 |
| 11     | Nervous System | 17, 18, 23 | Structure of the Brain, spinal cord and neurons, eye and ear.  
• Sheep eye dissection***  
Nervous System Physiology-  
sensation, hearing, touch, reflexes and taste  
Case Study | 16, 17 |
| 12     | Endocrine System | 19, 20, 23 | Protein, amine and steroid hormones and targets  
Case Study | 18 |
| 13     | Reproductive System | 21, 23 | Male and Reproductive Anatomy  
Contraception  
Case Study | 19 |
| 14     | Case Studies and Review | | Case Studies/Review |
| 15     | Review and Final Laboratory Exam | | Handouts |

* Specific Examinations and assignment dates are included for each course  
**Case Studies packets are provided to and selected by instructors. Students will receive case study handouts or links to access the case studies online.  
*** Dissections are at the Instructor’s discretion and may be actual or virtual.