# Course Description

This course contains laboratory studies of the structure and function of the systems included in BIO 107.

# University Learning Outcomes (ULO)

* **ULO1:** Knowledge of Human Cultures and the Physical and Natural World
* **ULO2:** Intellectual and Practical Skills
* **ULO3:** Personal and Social Responsibility
* **ULO4:** Integrative and Applied Learning­
* **ULO5:** Immersed in the Critical Concerns of the Sisters of Mercy of the Americas

# Program Learning Outcomes (PLO)

* **PLO1:** Synthesizes knowledge of nursing and the liberal arts and sciences as a basis for professional nursing practice.
* **PLO2:** Utilize professional judgment to formulate nursing decisions which reflect professional standards consistent with moral and ethical and legal principles.
* **PLO3:** Engages in reflective evaluation of self and other members of the healthcare team in accordance with the prevailing standards of care.
* **PLO4:** Collaborates with other health care providers and consumers in promoting the health and wellbeing of individuals, families, and communities.
* **PLO5:** Demonstrates responsibility and accountability in the use of the nursing process to deliver person centered care.
* **PLO6:** Utilize inter and intra professional communication and collaboration skills to deliver evidence-based care to promote the health and safety of individuals, families, and communities.
* **PLO7:** Applies leadership concepts, skills, and values to effectively implement patient safety and quality improvement initiatives in a variety of healthcare settings.
* **PLO8:** Creates a supportive environment through the therapeutic use of self when caring for individuals, families, and communities.
* **PLO9:** Demonstrates skills in using patient care technology, information systems, and communication devices that support safe nursing practice.
* **PLO10:** Integrates knowledge of social and cultural factors to deliver culturally sensitive care.
* **PLO11:** Advocates for social justice including a commitment to the health of vulnerable populations and the eliminations of health disparities to improve the human condition.
* **PLO12:** Articulates the value of pursuing practice excellence and lifelong learning to facilitate personal and professional development.

# Course Learning Outcomes (CLO)

* **CLO1:** Utilize accurate anatomical terminology in describing body systems. *(PLO2, PLO3, PLO7)*
* **CLO2:** Explain physiological processes of body systems. *(PLO2, PLO3, PLO7)*
* **CLO3:** Compare and contrast the gross and microscopic anatomy of the organs of all body systems. (*PLO2, PLO3, PLO7*)
* **CLO4:** Identify proper spelling for major markings on bones, major skeletal muscles, as well as nervous and special senses structures. (*PLO2, PLO3, PLO7*)
* **CLO5:** Summarize neurophysiology and the anatomy and functions of the brain, its subdivisions, the spinal cord, and special senses. (*PLO2, PLO3, PLO7*)
* **CLO6:** Describe functions of the human endocrine systems. (*PLO2, PLO3, PLO7*)
* **CLO7:** Distinguish the basic anatomical structures associated with select organs of body systems. (*PLO2, PLO3, PLO7*)
* **CLO8:** Procure, evaluate, and summarize current information from credible sources that apply to the anatomy and physiology of the human body. (*PLO2, PLO3, PLO7*)
* **CLO9:** Demonstrate basic laboratory techniques relevant to the field of anatomy and physiology. (*PLO2, PLO3, PLO7*)
* **CLO10:** Gather, analyze, and interpret data from anatomy and physiology laboratory observations. (*PLO2, PLO3, PLO6, PLO7*)

# Student Expectations

Students are expected to:

* Ask probing and insightful questions related to course content.
* Make meaningful and relevant connections and application to their own learning process.
* Be productive and contributing members of class discussions.

# Laboratory Materials

You must order the laboratory kit from LabPaq to participate in this course. Follow the steps below to order your lab kit:

1. Go to the [Hands-On Labs (HOL) website](https://holscience.com/).
2. Select **ORDER** from the top menu, then **Order** again from the pull-down menu.
3. Enter the following log-in information and password:
   * + - Log-in: C002464
       - Password: labpaq
4. Select **Anatomy & Physiology** from the sidebar.
5. Choose the item **SKU:** LP-2001-AP-01 **Code:** AP-1
6. Follow the prompts to complete your order.
7. Also, order the basic microscope ([600x Microscope](http://www.holscience.com/mm5/merchant.mvc?Screen=PROD&Product_Code=10-0415-00-01)). Item information **SKU:** 10-0415-00-01 **Code:** 600x Microscope. You **do not** need the oil immersion lens with the microscope.

**Accessing Your Lab Manual**

1. After you have your LabPaq, access the **Lab Manual** with the following link: **Faculty: Enter URL address of your lab course** .
2. Enter the **Kit Code** (14-digit number) on the outside of the box that contains your LabPaq. The Kit Code is a 14-digit number.

# Suggested Point Values

|  |  |  |
| --- | --- | --- |
| **Assessment** | **Point Value** | **Due** |
| **Week 1** |  |  |
| Laboratory: Getting Started | 90 |  |
| Laboratory: Laboratory Safety | 90 |  |
| **Week 2** |  |  |
| Laboratory: Using the Microscope | 90 |  |
| Laboratory: An Overview of Anatomy | 90 |  |
| **Week 3** |  |  |
| Laboratory: Histology | 90 |  |
| **Week 4** |  |  |
| No assignments this week | 0 |  |
| **Week 5** |  |  |
| Laboratory: Overview of the Skeletal System | 90 |  |
| Laboratory: Axial and Appendicular Skeleton | 90 |  |
| Laboratory: Joints and Body Movements | 90 |  |
| **Week 6** |  |  |
| Laboratory: Gross Anatomy of the Muscular System | 90 |  |
| **Week 7** |  |  |
| Laboratory: Gross Anatomy of the Central Nervous System | 90 |  |
| **Week 8** |  |  |
| Laboratory: Reflex and Sensory Physiology | 100 |  |
| **Total Points** | **1000** |  |

**Grading Scale**

|  |  |
| --- | --- |
| **Grade** | **Range** |
| A | 93-100 |
| A- | 90-92 |
| B+ | 87-89 |
| B | 83-86 |
| B- | 82-80 |
| C+ | 77-79 |
| C | 73-76 |
| C- | 70-72 |
| D+ | 67-69 |
| D | 63-66 |
| D- | 60-62 |
| F | 59 |

# Course Schedule

|  |  |  |
| --- | --- | --- |
| **Week** | **Start** | **End** |
| One | <insert start date> | <insert end date> |
| Two |  |  |
| Three |  |  |
| Four |  |  |
| Five |  |  |
| Six |  |  |
| Seven |  |  |
| Eight |  |  |

# Weekly Learning Modules

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| --- | --- | --- | --- |
| **Week One: Introduction to A&P and Chemistry of Life** | | | |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Provide a basic overview of the microscope and explain the techniques for examining histology samples under the microscope. | | CLO7, CLO8, CLO9 | |
| ***Laboratory***  *Students must complete the laboratory assignment(s) using the Hands-On Lab kit.* | | ***Alignment*** | ***AIE*** |
| **Laboratory: Getting Started**  All the laboratory activities are broken down into three sections:   1. Exploration, which gives you targeted background material 2. Experimentation, where you perform actual experiments and analyze the data and take photos of your experiments 3. Evaluation, where you will draw final conclusions from your experimental data and answer questions related to your experiment outcomes   Your first lab is the **Getting Started** section.  **Access** your **Lab Manual** using the link provided by your instructor.  Finally, with the help of Hands-On Lab software, generate a PDF with your results and attach it to the assignment link in Blackboard. When submitting lab assignments into Blackboard, attach the PDF assignments.  **Submit** the Getting Started Lab Report. | | 1.1 | Lab work and feedback = **1 hr.** |
| **Laboratory: Laboratory Safety**  This activity teaches the similarities and differences in safe practices between traditional laboratories and how to adapt them to home laboratories. You will learn the components of a safety data sheet and how to use one with respect to a laboratory spill or accident. You will view a safety video and commit to a safety agreement. You will prepare your home to begin experiments when your LabPaqarrives.  **Prepare** to provide some of the supplies for your experiments from home supplies such as paper towels, cleaning wipes, and other cleaning solutions.  **Access** your **Lab Manual** using the link provided by your instructor and review the Laboratory Safety section. You will review the following in this section:   * Discuss basic safety concerns and guidelines. * Identify potential laboratory hazards. * Describe various forms and uses of safety equipment. * Compare safe practices in traditional and home laboratories. * Outline components of a safety data sheet. * View a safety video. * Commit to a safety agreement.   **Submit** the Laboratory Safety Report. | | 1.1 | Lab work and feedback = **1 hr.** |
| **Total** |  |  |  |

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| Week Two: Cells and Metabolism | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Gather, analyze, and interpret data from anatomy and physiology laboratory observations related to histology. | | CLO7, CLO8, CLO9 | |
| ***Laboratory***  *Students must complete the laboratory assignment(s) using the Hands-On Lab kit.* | | ***Alignment*** | ***AIE*** |
| **Laboratory: Using the Microscope**  **Resources from Lab Manual:** Using the Microscope Lab Guide; Using the Microscope Lab Report Template  **Read** the entire Using the Microscope Lab Guide before you begin the lab.  **Complete** the Using the Microscope Lab, in which you perform the following:   * Identify the different types of microscopes and their uses. * Describe the parts of a microscope, as well as how to calculate total magnification, depth of field, and field of view. * View a variety of prepared slides under different levels of magnification.   *Note*: This lab will take a minimum of 1 hour and 30 minutes to complete. Lab Manual link provided by your instructor.  **Complete** the lab report, which includes the following:   * Photographs of you performing the laboratory work * References beyond the textbook and the lab manual   **Submit** the Using the Microscope Lab Report. | | 2.1 | Lab work and feedback =  **1.5 hrs.** |
| **Laboratory: An Overview of Anatomy**  **Resources from Lab Manual:** An Overview of Anatomy Lab Guide; An Overview of Anatomy Lab Report Template  **Read** the entire An Overview of Anatomy Lab Guide before you begin the lab.  **Complete** the An Overview of Anatomy Lab, in which you do the following:   * Describe common anatomical terms of the body and locate regions of the body in reference to anatomical position. * Use a model to demonstrate three planes in reference to anatomical position. * Identify the 11 organ systems, indicate the organs that are included in each system, and discuss the function of each organ system.   *Note*: This lab will take a minimum of 2 hours and 30 minutes to complete. Lab Manual link provided by your instructor.  **Complete** the lab report, which should include the following:   * Photographs of you performing the laboratory work * References beyond the textbook and the lab manual   **Submit** the Overview of Anatomy Lab Report. | | 2.1 | Lab work and feedback = **2.5 hrs.** |
| **Total** |  |  |  |

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| --- | --- | --- | --- |
| Week Three: Tissues | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Interpret data from anatomy and physiology laboratory observations related to histology. | | CLO7, CLO8, CLO9 | |
| ***Laboratory***  *Students must complete the laboratory assignment(s) using the Hands-On Lab kit.* | | ***Alignment*** | ***AIE*** |
| **Laboratory: Histology**  **Resources from Lab Manual:** Histology Lab Guide; Histology Lab Report Template  **Read** the entire Histology Lab Guide before you begin the lab.  **Complete** the Histology Lab, in which you will do the following:   * Define *histology* and identify the characteristics of epithelial, connective, muscle, and nervous tissue. * Classify the functional and structural types of epithelial, connective, muscle, and nervous tissue, and view them microscopically.   *Note*: This lab will take a minimum of 2 hours and 30 minutes to complete. Lab Manual link provided by your instructor.  **Complete** the lab report, which should include the following:   * Photographs of you performing the laboratory work * References beyond the textbook and the lab manual   **Submit** the Histology Lab Report. | | 2.1 | Lab work and feedback = **2.5** **hrs.** |
| **Total** |  |  |  |

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| Week Four: Integumentary System | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| No objectives this week. | | N/A | |
| ***Laboratory***  *Students must complete the laboratory assignment(s) using the Hands-On Lab kit.* | | ***Alignment*** | ***AIE*** |
| **Laboratory Preparation: Overview of the Skeletal System**  **Resources from Lab Manual:** Overview of the Skeletal System Lab Guide; Overview of the Skeletal System Lab Report Template  **Read** the entire Overview of the Skeletal System Lab Guide before you begin the lab.  **Begin** the Overview of the Skeletal System Lab, in which you do the following:   * Utilize a skeletal model to learn about the structure of the skeletal system and its components. * Describe how the structure of bone tissue contributes to the overall function of the skeletal system and explore the concepts of bone growth and bone remodeling. * Perform a comparison of the microscopic structure of bone and cartilage found in the skeletal system.   *Note*: This lab will take a minimum of 3 hours and 30 minutes to complete.  The Overview of the Skeletal System Lab Report is due at the end of **Week 5**. | | 5.2, 5.3 | Lab work and feedback =  **1 hr.** |
| **Laboratory Preparation: Axial and Appendicular Skeleton**  **Resources from Lab Manual:** Axial and Appendicular Skeleton Lab Guide; Axial and Appendicular Skeleton Lab Report Template  **Read** the entire Axial and Appendicular Skeleton Lab Guide before you begin the lab.  **Begin** the Axial and Appendicular Skeleton Lab, in which you do the following:   * Utilize a skeletal model to learn about the skeletal system and its components, the axial, and appendicular regions. * Utilize the model skeleton to discover how the two regions work together to provide mobility. * Identify major surface markings and characteristics of bones and identify their functional relevance. * Explore the major types of bones and cartilage in the skeletal system.   *Note*: This lab will take a minimum of 3 hours to complete.  The Axial and Appendicular Skeleton Lab Report is due at the end of **Week 5**. | | 5.1, 5.3 | Lab work and feedback =  **1 hr.** |
| **Total** |  |  |  |

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| Week Five: Bones and Joints | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Distinguish between the axial and appendicular skeletons and name the major parts of each. | | CLO1, CLO3 | |
| * 1. Classify joints according to the type of tissue binding the bones together, describe the different joint characteristics, and name an example of each joint type. | | CLO1, CLO3 | |
| * 1. Identify through laboratory examination the bones and components of the skeletal system. | | CLO7, CLO8, CLO9 | |
| ***Laboratory***  *Students must complete the laboratory assignment(s) using the Hands-On Lab kit.* | | ***Alignment*** | ***AIE*** |
| **Laboratory: Overview of the Skeletal System**  **Resources from Lab Manual:** Overview of the Skeletal System Lab Guide; Overview of the Skeletal System Lab Report Template  **Read** the entire Overview of the Skeletal System Lab Guide before you begin the lab.  **Begin** the Overview of the Skeletal System Lab, in which you do the following:   * Utilize a skeletal model to learn about the structure of the skeletal system and its components. * Describe how the structure of bone tissue contributes to the overall function of the skeletal system and explore the concepts of bone growth and bone remodeling. * Perform a comparison of the microscopic structure of bone and cartilage found in the skeletal system.   *Note*: This lab will take a minimum of 3 hours and 30 minutes to complete.  **Complete** the lab report, which should include the following:   * Photographs of you performing the laboratory work * References beyond the textbook and the lab manual   **Submit** the Overview of the Skeletal System Lab Report. | | 5.2, 5.3 | Lab work and feedback =  **1.5 hrs.** |
| **Laboratory: Axial and Appendicular Skeleton**  **Resources from Lab Manual:** Axial and Appendicular Skeleton Lab Guide; Axial and Appendicular Skeleton Lab Report Template  **Complete** the Axial and Appendicular Skeleton Lab.  *Note*: This lab will take a minimum of 3 hours to complete.  **Complete** the lab report, which should include the following:   * Photographs of you performing the laboratory work * References beyond the textbook and the lab manual   **Submit** the Axial and Appendicular Skeleton Lab Report. | | 5.1, 5.3 | Lab work and feedback = **1.5 hrs.** |
| **Laboratory: Joints and Body Movements**  **Resources from Lab Manual:** Joints and Body Movements Lab Guide; Joints and Body Movements Lab Report Template  **Read** the entire Joints and Body Movements Lab Guide before you begin the lab.  **Complete** the Joints and Body Movements Lab, in which you do the following:   * Describe general joint structure and function. * Observe different types of joints on a human skeleton model and palpate these same joints on the human body. * Perform complex human movements and describe how the joints of the body are affected during these movements. * Dissect a chicken wing to view the structures of a synovial joint.   *Note*: This lab will take a minimum of 4 hours and 30 minutes to complete.  **Complete** the lab report, which should include the following:   * Photographs of you performing the laboratory work * References beyond the textbook and the lab manual   **Submit** the Joints and Body Movements Lab Report. | | 5.2, 5.3 | Lab work and feedback = **4.5 hrs.** |
| **Total** |  |  |  |

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| Week Six: Muscles and Muscular System | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Identify through laboratory examination the components of the muscular system. | | CLO7, CLO8, CLO9 | |
| ***Laboratory***  *Students must complete the laboratory assignment(s) using the Hands-On Lab kit.* | | ***Alignment*** | ***AIE*** |
| **Laboratory: Gross Anatomy of the Muscular System**  **Resources from Lab Manual:** Gross Anatomy of the Muscular System Lab Guide; Gross Anatomy of the Muscular System Lab Report Template  **Complete** the Gross Anatomy of the Muscular System Lab.  **Complete** the lab report, which should include the following:   * Photographs of you performing the laboratory work * References beyond the textbook and the lab manual   **Submit** the Gross Anatomy of the Muscular System Lab Report. | | 6.1 | Lab work and feedback = **1.5 hrs.** |
| **Total** |  |  |  |

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| --- | --- | --- | --- |
| Week Seven: Nervous System | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Identify the two major groups of the nervous system organs. | | CLO1, CLO4, CLO6 | |
| * 1. Explain the general functions of the nervous system. | | CLO1, CLO4 | |
| * 1. Describe the general structure of the neuron. | | CLO1, CLO4 | |
| * 1. List the major parts of the referral nervous system. | | CLO1, CLO4 | |
| * 1. Identify through laboratory examination the components of the nervous system. | | CLO7, CLO8, CLO9 | |
| ***Laboratory***  *Students must complete the laboratory assignment(s) using the Hands-On Lab kit.* | | ***Alignment*** | ***AIE*** |
| **Laboratory: Gross Anatomy of the Central Nervous System**  **Resources from Lab Manual:** Gross Anatomy of the Central Nervous System Lab Guide; Gross Anatomy of the Central Nervous System Lab Report Template  **Read** the entire Gross Anatomy of the Central Nervous System Lab Guide before you begin the lab.  **Complete** the Gross Anatomy of the Central Nervous System Lab, in which you do the following:   * Identify the structures and functions of the brain stem, cerebellum, diencephalon, cerebrum, and spinal cord of the human central nervous system. * Model the human brain. * Describe the functions of the twelve cranial nerves and spinal nerves. * Identify the structures of a sheep brain through dissection.   *Note*: This lab will take a minimum of 3 hours and 30 minutes to complete.  **Complete** the lab report, which should include the following:   * Photographs of you performing the laboratory work * References beyond the textbook and the lab manual   **Submit** the Gross Anatomy of the Central Nervous System Lab Report. | | 7.1, 7.2, 7.3, 7.4, 7.5 | Lab work and feedback = **3.5 hrs.** |
| **Total** |  |  |  |

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| Week Eight: Endocrine System | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Identify the structures of an eye including the vitreous body, lens, and retina. | | CLO1, CLO5 | |
| ***Laboratory***  *Students must complete the laboratory assignment(s) using the Hands-On Lab kit.* | | ***Alignment*** | ***AIE*** |
| **Laboratory: Reflex and Sensory Physiology**  The lab on Reflex and Sensory Physiology includes exploration, experimentation, and evaluation. The main topics include the following:   * Explain the association between taste and smell. * Describe the mechanisms of hearing and balance. * Identify the structures and functions of the eye. * Order the nervous system pathway from the initial stimulus to the final response. * Analyze the association between taste and smell. * Test hearing loss in specific areas of the ear. * Analyze the association of vision and balance. * Test your "blind spot" range and examine an afterimage. * Dissect a cow eye and identify the structures including the vitreous body, lens, and retina.   **Complete** the lab and exercises which include the following:   1. Taste and Smell 2. Hearing and Balance 3. Blind Spots and Afterimages 4. Testing a Stretch Reflex 5. Cow Eye Dissection   **Submit** your results. | | 7.5, 8.1 | Lab work and feedback =  **3.5 hrs.** |
| **Total** |  |  |  |

# Breakdown of Academic Instructional Equivalencies

|  |  |
| --- | --- |
|  | **AIE Hours** |
| **Week 1** |  |
| Required | 2 |
| Supplemental |  |
| **Week 2** |  |
| Required | 4 |
| Supplemental |  |
| **Week 3** |  |
| Required | 3.5 |
| Supplemental |  |
| **Week 4** |  |
| Required | 3 |
| Supplemental |  |
| **Week5** |  |
| Required | 7.5 |
| Supplemental |  |
| **Week 6** |  |
| Required | 1.5 |
| Supplemental |  |
| **Week 7** |  |
| Required | 3.5 |
| Supplemental |  |
| **Week 8** |  |
| Required | 3.5 |
| Supplemental |  |
|  |  |
| **Total Required Hours** | 28.5 |
| **Total Supplemental Hours** |  |
| **Total Hours** | 28.5 |