# Course Description

Application of the experimental techniques of chemistry to the study of the structure, function and reactions of organic and biological compounds. One credit (three hours lab).

Pre-requisite: C or better in CHM 115 and CHM 115L or permission of course director. Co-requisite: CHM116 or permission of course director.

# 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**: Express an appreciation and understanding of a variety of aesthetic, literary, cultural and ideological traditions.(ULO 2, 3)
* **PLO2**: Engage meaningfully in a community of scholarship through inquiry, research and the communication of ideas. (ULO 2, 4)
* **PLO3**: Evaluate historical, political, economic and scientific data while recognizing the interrelatedness of events and processes. (ULO 1, 2, 3, 4)
* **PLO4:** Demonstrate an understanding of the impact of technology on society. (ULO7)
* **PLO5**: Reflect upon the relationship of the Divine to the human experience. (ULO 2, 3, 4)
* **PLO6**: Examine and understand the dynamics of individual and group behavior. (ULO 2, 4)
* **PLO7**: Demonstrate an understanding of quantitative reasoning. (ULO 1, 2, 4)
* **PLO8**: Engage in constructive activities of service to the community in light of the Gospel tradition as experienced through the Mercy charism that shapes the College. (ULO 2, 3, 4)

# Course Learning Outcomes (CLO)

* **CLO1:** Demonstrate the quantitative and qualitative skills needed to succeed in chemistry, including the ability to read and interpret graphs, the ability to apply algorithms to problem solving, and the ability to employ critical-thinking skills. The student will demonstrate these abilities through performance on formative and summative assignments on MasteringChemistry and performance on examinations.
* **CLO2:** Demonstrate the mastery of specific knowledge and skills in chemistry listed in the learning objectives for each chapter posted on the Blackboard site and the ability to make connections between concepts in chemistry. The student will demonstrate this mastery through performance on formative and summative assignments on MasteringChemistry and performance on examinations.
* **CLO3:** Apply the fundamental principles of chemistry to the composition, structures, and processes of human physiology. The student will demonstrate this ability through performance on formative and summative assignments on MasteringChemistry and performance on examinations.

# 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.

# Required Course Materials

* **HOLSciences Mail-Order Lab Kit #BR-1037-CK-02**
  + Go to [HOLSciences website](http://www.holscience.com/).
  + Under the Lab Kits drop-down menu at the top, click on **Student Ordering**.
  + When it asks if you have a login and password, click **Yes**.
  + Enter the following:
    - Login: *C002464*
    - Password: *labpaq*
* Click **Login**.
* Under the LABPAQS section in the left-hand column, select **CHEMISTRY**.
* Select **Custom Chemistry Premium (SKU: BR-1037-CK-02)** and follow the prompts to complete your order.
* Contact Hands-On Learning immediately if you notice that you have any missing, spoiled, or damaged materials in your lab kit:
  + - E-mail: info@holscience.com
    - Phone: 866-206-0773
    - [HOL Web Form Contact](http://holscience.com/contact/)
    - [Hands-On Learning FAQ Page](http://holscience.com/orders/faq/)
    - [Hands-On Learning Returns and Refunds Policy](http://holscience.com/orders/returns-refunds/)
    - [Hands-On Learning Safety Information](http://holscience.com/safety/)
* **Recommended: Indigo Molecular Modeling Kit**
* While not required for this course, the molecular modeling kit can help with appreciating the spatial orientation of atoms and bonds critical in organic chemistry.

You may purchase the [molecular modeling kit](https://www.indigo.com/molecular_models/student_sets/molecular-model-kit-organic-chemistry-set-68845NV.html).

# Suggested Point Values

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| --- | --- | --- |
| **Assessment** | **Point Value** | **Due** |
| **Week 1** |  |  |
| No Lab Assignments | n/a |  |
| **Week 2** |  |  |
| Laboratory: Getting Started | 25 |  |
| Laboratory: Laboratory Safety | 25 |  |
| **Week 3** |  |  |
| Laboratory: Stereochemistry | 200 |  |
| Laboratory: Macromolecules of Life: Sugars and Starches – Exploration, Experimentation, Evaluation | 200 |  |
| **Week 4** |  |  |
| Laboratory: Hydrolysis of Acetylsalicylic Acid Sympathetic Ink – Exploration, Experimentation, Evaluation | 200 |  |
| **Week 5** |  |  |
| Laboratory: Synthesis and Analysis of Soap – Exploration, Experiment, Evaluation | 200 |  |
| **Week 6** |  |  |
| Laboratory: Macromolecules of Life: Amino Acids and Lipids – Exploration, Experimentation, Evaluation | 200 |  |
| Laboratory: Comparative Cell Membranes and Transport – Exploration, Experimentation, Evaluation | 200 |  |
| **Week 7** |  |  |
| Laboratory: Enzymes: Temperature, pH, and Specificity – Exploration, Experimentation, Evaluation | 200 |  |
| **Week 8** |  |  |
| Laboratory: Extraction of DNA – Exploration, Experimentation, Evaluation | 200 |  |
| **Total Points** | **1650** |  |

**Grading Scale**

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| --- | --- |
| **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

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| --- | --- | --- |
| **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 Organic Chemistry and Alkanes** | | |
| ***Resources, Activities, and Preparation***  *Utilize these resources and complete these activities in preparation for your graded assignments.* | ***Alignment*** | ***AIE*** |
| **Tutorials**  During this course you will be asked to use and participate in various technologies to complete activities and assignments.  **Review** the tutorials available on Blackboard as needed.  **Click** the **Student Resources** button from the menu on the left. | N/A | N/A |
| **Weekly Participation and Discussion**  The purpose of the weekly discussions is to provide you with a way to synthesize the concepts presented in this course. Each week, you will respond to the discussion questions with a substantive post of 200-to 250-words that addresses all the prompts for the question by 11:59 p.m. EST of the listed due date. By the conclusion of each week, Sunday at 11:59 p.m. EST, you will make at least one substantive comment of 100-to 150-words to three of your classmates’ posts for each assigned discussion question. Your comments must further the discussion by following the RISE Model for meaningful feedback. It is recommended that you check in periodically throughout the week to ensure that you are meeting the participation requirement.  **Review** the RISE Model for Peer Feedback, located on Blackboard. |  |  |
| **HOLCloud Registration**  You will complete the laboratory assignments (listed under the Laboratory section in each week of the Syllabus) using your Hands-On Learning lab kit and its companion site HOLCloud. Complete the following as early as possible in Week 1:   * After receiving the HOLSciences lab kit, confirm all materials are present. * Ensure that you have the following information before attempting registration:   + HOLCLOUD ACCESS CODE: An ACCESS CODE will be included with your lab kit, but if you have difficulty locating, please contact HOLSciences Support (see below).   + HOLCLOUD COURSE LINK: Your instructor will post a link to this course’s instance of HOLCloud in the Announcements forum. * Navigate to HOLCloud using the course link provided by your instructor. * Follow directions as outlined in HOLCloud Getting Started on the HOLSciences website to complete the registration using your HOLCloud access code. * For questions, please contact HOLSciences support (e-mail: info@holscience.com, Phone: 866-206-0773).   Once you have registered, begin completing the lab assignments listed in the Laboratory section of each week of this Syllabus. This week, you must start with the Getting Started and Laboratory Safety assignments. As you complete your labs, remember the following precautions:   * Follow all lab and safety guidelines as described in the HOLCloud Lesson procedures. * Wear the appropriate safety gear during labs, including gloves, goggles, and any other designated equipment. * Conduct each lab as described in the HOLCloud Lesson procedures. * Use lab equipment only in the specifically designated manner. | N/A | N/A |
| ***Supplemental Resources and Activities***  *Explore these optional resources to deepen your understanding.* | ***Alignment*** | ***AIE*** |
| **Adobe Connect Live Discussion**  **Review** [Adobe Connect Resources](https://sites.gmercyu.edu/student-resources/adobe-connect-resources/).  **Participate** in the scheduled live session with the course instructor. This session will provide an overview of the class and discuss the major assignments in the course.  **Prepare** to ask questions concerning the content of the week and the course as a whole.  Note: A recorded lecture will be made available to those who are unable to attend the live session. |  | Live Discussion: lecture and discussion = **1 hour** |
| ***Laboratory Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | ***Alignment*** | ***AIE*** |
| **Laboratory Notice for Week 1**  **Review** the lab requirements for this course to ensure you have the necessary lab materials.  You will begin your lab work in Week 2.  There are no labs to be completed this week. If you have any difficulties obtaining your lab materials by Week 2, inform your instructor via e-mail immediately. | N/A | Review lab requirements and inquiries to instructor =  **.5 hour** |

# Faculty Notes

**Lab Instructions:** As a reminder, faculty must post the **HOLCloud course link** within the Announcements forum in order for students to access their HOLCloud lab class and to properly register the lab kit’s access code.

**Assignment Suggested Point Values:** These are just suggestions and instructors should feel free to change the values or weights as they deem appropriate – just remember to inform students of any such material changes.

**Instructors should contact their HOLScience’s area representative before the classes begin to confirm their class information and access to the instructor version of the online software.**

**Course Setup**

**General Questions and Discussion Forum:** This course includes a discussion forum for general questions, comments, and concerns. This forum is intended for any course-related commentary not found within a specific weekly discussion. This forum is not graded. Make sure to monitor this forum for student posts. You are encouraged to make an announcement advertising this forum and monitor and post regularly to build engagement.

**Adobe Connect:** Consider posting an announcement asking students to submit any questions or topics they'd like addressed ahead of time. The instructor can then utilize those questions that come up in the first part of the week to tailor the live Adobe Connect class session that would be scheduled toward the later part of the week. That 1-hour synchronous session will allow students the opportunity to go over any questions they had with the homework and clarify any misconceptions they have about the course content. All Adobe Connect sessions should be recorded and a link to the recording be posted to the course page so any student who misses the session can review it later in the week.

*Note:* It is the instructor’s choice as to what day they will schedule the Adobe Connect Live Session, but it is recommended that they schedule this session for Wednesday of the week so students have plenty of time to review their homework prior to the deadline on Sunday.

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| Week Two: Alkenes, Alkynes, Aromatic Compounds, Alcohols, Phenols, Thiols, and Ethers |  |  |
| ***Learning Objectives*** | ***Alignment*** | |
| * 1. Name cis-trans isomers of alkenes from their structural formulas. | CLO1, CLO2 | |
| ***Laboratory Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | ***Alignment*** | ***AIE*** |
| **Laboratory Safety Notice**  **Follow** all lab and safety guideline as described in the HOLCloud procedures.  **Wear** the appropriate safety gear during labs, including gloves, goggles, and any other designated equipment.  **Conduct** each lab as described in the HOLCloud procedures.  **Use** lab equipment only in the specifically designated manner. | N/A | N/A |
| **Laboratory: Getting Started**  **Complete** the Getting Started Lab as described in the HOLCloud Lesson procedures.  *Note*: This lab will take a minimum of 1 hour to complete.  **Submit** your completed Lab Report to the instructor.  *Note:* Confirm with your instructor for the preferred method of submitting your completed Lab Reports. | CLO1, CLO2 | Complete the lab and review instructor feedback =  **1 hour** |
| **Laboratory: Laboratory Safety**  **Complete** the Laboratory Safety Lab as described in the HOLCloud Lesson procedures.  *Note*: This lab will take a minimum of 1.5 hours to complete.  **Submit** your completed Lab Report to the instructor.  *Note:* Confirm with your instructor for the preferred method of submitting your completed Lab Reports. | CLO1, CLO2 | Complete the lab and review instructor feedback = **2 hours** |

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| Week Three: Aldehydes, Ketones, Chiral Molecules, and Carbohydrates |  |  |
| ***Learning Objectives*** | ***Alignment*** | |
| * 1. Identify the carbonyl group. | CLO1, CLO2 | |
| * 1. Differentiate aldehyde and ketone functional groups. | CLO1, CLO2 | |
| * 1. Describe the solubility of simple aldehydes and ketones in water. | CLO1, CLO2 | |
| * 1. Draw the condensed structural formulas for the products of addition of alcohols to simple aldehydes and ketones. | CLO1, CLO2 | |
| * 1. Identify chiral and achiral carbon atoms in an organic molecule. | CLO1, CLO2 | |
| * 1. Classify a monosaccharide as an aldose or ketose and indicate the number of carbon atoms. | CLO1, CLO2 | |
| * 1. Draw Fischer projections of the D or L stereoisomers of glucose, galactose, and fructose. | CLO1, CLO2 | |
| * 1. Determine if a carbohydrate is a reducing sugar. | CLO1, CLO2 | |
| * 1. Describe the monosaccharide units and glycosidic bonds in disaccharides. | CLO1, CLO2 | |
| * 1. Describe the structural features of amylose, amylopectin, glycogen, and cellulose. | CLO1, CLO2 | |
| ***Laboratory Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | ***Alignment*** | ***AIE*** |
| **Laboratory Setup**  **Note** that this week requires two labs to be completed. Please plan accordingly.  **Complete** all the lab activities for this week. | N/A | N/A |
| **Laboratory: Stereochemistry**  **Resource: Stereochemistry Laboratory, Stereochemistry Lab Answer Sheet**  **Download** both the Stereochemistry Laboratory and the Stereochemistry Lab Answer Sheet.  **Complete** the activities in the Stereochemistry Laboratory.  **Answer** all the questions in the Stereochemistry Lab Answer Sheet.  *Note*: This lab will take a minimum of 2 hours to complete.  **Submit** the Stereochemistry Lab Answer Sheet according to instructor preference. | 2.1, 3.5, 3.7 | Complete the lab and review instructor feedback =  **2 hours** |
| **Laboratory: Macromolecules of Life: Sugars and Starches – Exploration, Experimentation, Evaluation**  **Complete** the Macromolecules of Life: Sugars and Starches – Exploration Lab.  **Complete** the Macromolecules of Life: Sugars and Starches – Experimentation Lab.  **Complete** the Macromolecules of Life: Sugars and Starches – Evaluation Lab.  *Note*: The Exploration and Evaluation sections of the lab will take a minimum of 30 minutes each to complete. The Experimentation section of the lab will take a minimum of 3 hours to complete.  **Submit** your completed Lab Reports according to instructor preference. | 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.8, 3.9, 3.10 | Complete the lab and review instructor feedback = **4 hours** |

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| Week Four: Carboxylic Acids, Esters, and Lipids |  |  |
| ***Learning Objectives*** | ***Alignment*** | |
| * 1. Write the IUPAC names for simple carboxylic acids. | CLO1, CLO2 | |
| * 1. Write the common names for simple carboxylic acids. | CLO1, CLO2 | |
| * 1. Draw the condensed structural formula of a simple carboxylic acid given its name. | CLO1, CLO2 | |
| * 1. Describe the solubility and ionization of carboxylic acids in water. | CLO1, CLO2 | |
| * 1. Write a balanced chemical equation for the formation of an ester. | CLO1, CLO2 | |
| * 1. Write the IUPAC names for simple esters. | CLO1, CLO2 | |
| * 1. Write the common names for simple esters. | CLO1, CLO2 | |
| * 1. Draw condensed structural formulas for simple esters. | CLO1, CLO2 | |
| * 1. Describe the solubility of simple esters in water. | CLO1, CLO2 | |
| * 1. Draw the condensed structural formulas for the hydrolysis products of simple esters. | CLO1, CLO2 | |
| * 1. Describe the classes of lipids. | CLO1, CLO2 | |
| * 1. Draw the condensed structural formula for a fatty acid and identify it as saturated or unsaturated. | CLO1, CLO2 | |
| * 1. Draw the condensed structural formula for a wax or a triacylglycerol produced by the reaction of a fatty acid and an alcohol or glycerol. | CLO1, CLO2 | |
| * 1. Draw the condensed structural formula for the product of a triacylglycerol that undergoes hydrogenation, hydrolysis, or saponification. | CLO1, CLO2 | |
| * 1. Describe the structure of a phospholipid containing glycerol or sphingosine. | CLO1, CLO2 | |
| * 1. Describe the composition and function of the lipid bilayer in cell membranes. | CLO1, CLO2, CLO3 | |
| ***Laboratory Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | ***Alignment*** | ***AIE*** |
| **Laboratory: Hydrolysis of Acetylsalicylic Acid Sympathetic Ink – Exploration, Experimentation, Evaluation**  **Complete** the Hydrolysis of Acetylsalicylic Acid Sympathetic Ink – Exploration Lab.  **Complete** the Hydrolysis of Acetylsalicylic Acid Sympathetic Ink – Experimentation Lab.  **Complete** the Hydrolysis of Acetylsalicylic Acid Sympathetic Ink – Evaluation Lab.  *Note*: The Exploration and Evaluation sections of the lab will take a minimum of 30 minutes to complete. The Experimentation section of the lab will take a minimum of 3 hours and **one overnight incubation** to complete.  **Submit** your completed Lab Reports according to instructor preference. | 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10 | Complete the lab and review instructor feedback = **5 hours** |

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| Week Five: Amines, Amides, Amino Acids, and Proteins |  |  |
| ***Learning Objectives*** | ***Alignment*** | |
| * 1. Write the common names for the essential amino acids. | CLO1, CLO2, CLO3 | |
| * 1. Draw the zwitterion for an essential amino acid at its isoelectric point. | CLO1, CLO2 | |
| * 1. Draw the ionized structure of an essential amino acid at pH values above or below the isoelectric point given its name. | CLO1, CLO2 | |
| ***Laboratory Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | ***Alignment*** | ***AIE*** |
| **Laboratory: Synthesis and Analysis of Soap – Exploration, Experimentation, Evaluation**  **Complete** the Synthesis and Analysis of Soap – Exploration Lab.  **Complete** the Synthesis and Analysis of Soap – Experimentation Lab.  **Complete** the Synthesis and Analysis of Soap – Evaluation Lab.  *Note*: The Exploration and Evaluation sections of the lab will take a minimum of 30 minutes to complete. The Experimentation section of the lab will take a minimum of 3 hours to complete.  **Submit** your completed Lab Reports according to instructor preference. | 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.12, 4.13, 4.14 | Complete the lab and review instructor feedback = **4 hour** |

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| Week Six: Enzymes, Vitamins, Nucleic Acids, and Protein Synthesis |  |  |
| ***Learning Objectives*** | ***Alignment*** | |
| * 1. Describe enzymes and their role in enzyme-catalyzed reactions. | CLO1, CLO2 | |
| * 1. Classify enzymes using enzyme class names. | CLO1, CLO2 | |
| * 1. Describe the effect of temperature, pH, concentration of enzyme, and concentration of substrate on enzyme activity. | CLO1, CLO2 | |
| * 1. Describe competitive and noncompetitive inhibition, as well as reversible and irreversible inhibition with respect to enzymes. | CLO1, CLO2 | |
| * 1. Describe the primary structures of RNA and DNA. | CLO1, CLO2, CLO3 | |
| * 1. Describe the double helix of DNA. | CLO1, CLO2, CLO3 | |
| * 1. Describe the process of DNA replication. | CLO1, CLO2, CLO3 | |
| * 1. Describe some ways in which DNA is altered to cause mutations. | CLO1, CLO2, CLO3 | |
| * 1. Describe the preparation and uses of recombinant DNA. | CLO1, CLO2, CLO3 | |
| ***Laboratory Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | ***Alignment*** | ***AIE*** |
| **Laboratory: Macromolecules of Life: Amino Acids and Lipids – Exploration, Experimentation, Evaluation**  **Complete** the Macromolecules of Life: Amino Acids and Lipids – Exploration Lab.  **Complete** the Macromolecules of Life: Amino Acids and Lipids – Experimentation Lab.  **Complete** the Macromolecules of Life: Amino Acids and Lipids – Evaluation Lab.  *Note*: The Exploration and Evaluation sections of the lab will take a minimum of 30 minutes to complete. The Experimentation section of the lab will take a minimum of 3 hours and a 24-hour incubation period to complete.  **Submit** your completed Lab Reports according to instructor preference. | 4.11, 4.13, 4.14, 5.1, 5.2, 5.3 | Complete the lab and review instructor feedback = **1 hour** |
| **Laboratory: Comparative Cell Membranes and Transport**  **Complete** the Comparative Cell Membranes and Transport – Exploration Lab.  **Complete** the Comparative Cell Membranes and Transport – Experimentation Lab.  **Complete** the Comparative Cell Membranes and Transport – Evaluation Lab.  *Note*: The Exploration and Evaluation sections of the lab will take a minimum of 30 minutes to complete. The Experimentation section of the lab will take a minimum of 3 hours and a **25-hour incubation** period to complete.  **Submit** your completed Lab Reports according to instructor preference. | 4.11, 4.15, 4.16 | Complete the lab and review instructor feedback = **4 hours** |

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| Week Seven: Metabolic Pathways for Carbohydrates |  |  |
| ***Laboratory Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | ***Alignment*** | ***AIE*** |
| **Laboratory: Enzymes: Temperature, pH, and Specificity – Exploration, Experimentation, Evaluation**  **Complete** the Enzymes: Temperature, pH, and Specificity – Exploration Lab.  **Complete** the Enzymes: Temperature, pH, and Specificity – Experimentation Lab.  **Complete** the Enzymes: Temperature, pH, and Specificity – Evaluation Lab.  *Note*: The Exploration and Evaluation sections of the lab will take a minimum of 30 minutes to complete. The Experimentation section of the lab will take a minimum of 3 hours to complete.  **Submit** your completed Lab Reports according to instructor preference. | 6.1, 6.2, 6.3, 6.4 | Complete the lab and review instructor feedback = **3 hour** |

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| Week Eight: Metabolism and Energy Production and Metabolic Pathways for Lipids and Amino Acids |  |  |
| ***Laboratory Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | ***Alignment*** | ***AIE*** |
| **Laboratory: Extraction of DNA – Exploration, Experimentation, Evaluation**  **Complete** the Extraction of DNA – Exploration Lab.  **Complete** the Extraction of DNA – Experimentation Lab.  **Complete** the Extraction of DNA – Evaluation Lab.  *Note*: The Exploration and Evaluation sections of the lab will take a minimum of 30 minutes to complete. The Experimentation section of the lab will take a minimum of 1.5 hours and an **overnight incubation** to complete.  **Submit** your completed Lab Reports according to instructor preference. | 6.5, 6.6, 6.7, 6.8, 6.9 | Complete the lab and review instructor feedback = **3 hours** |

# Breakdown of Academic Instructional Equivalencies

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|  | **AIE Hours** |
| **Week 1** |  |
| Required | .5 |
| Supplemental | 1 |
| **Week 2** |  |
| Required | 3 |
| Supplemental |  |
| **Week 3** |  |
| Required | 6 |
| Supplemental |  |
| **Week 4** |  |
| Required | 5 |
| Supplemental |  |
| **Week5** |  |
| Required | 4 |
| Supplemental |  |
| **Week 6** |  |
| Required | 5 |
| Supplemental |  |
| **Week 7** |  |
| Required | 3 |
| Supplemental |  |
| **Week 8** |  |
| Required | 3 |
| Supplemental |  |
|  |  |
| **Total Required Hours** | 29.5 |
| **Total Supplemental Hours** | 1 |
| **Total Hours** | 30.5 |