**Cedar Crest College**

**Biology 121, Principles of Biology Lab, Fall 2011**

**General Course Information**

**Day and Time**  **Section Instructor**

Tuesday 8-11 AM 04 Dr. Debra Bressan

Wednesday 1-4 PM 03 Dr. Brian Misanko

Thursday 8-11 AM 01 Dr. Joy Karnas

Thursday 1-4 PM 05 Dr. Amy Reese

Thursday 4-7 PM 72 Prof. Judith Malitsch

**Number of Credits:** 1

**Required Materials:**

* Carbonless duplicate lab notebook designated for BIO 121 Lab (available at the College bookstore). Do not use a different notebook.
* Lab coat (available at the College bookstore).
* Metric ruler with millimeter resolution.
* Non-programmable calculator. You will need to use a calculator in lab and on lab exams. During exams you are only permitted to use a non-programmable calculator. The calculator cannot store information, and it cannot be part of another device (for example, a cell phone). You cannot share a calculator during an exam.

**Course Objectives, Outcomes and Assessment**

**1.** At the completion of the course, you will know how to perform essential lab methods and how to interpret experimental data. You will demonstrate the ability to maintain a proper lab notebook and to perform essential lab calculations (such as those required to make solutions with multiple ingredients and to perform straightforward statistical analyses). Notebook entries will be graded regularly by your instructor. Likewise, your ability to interpret data will be assessed by assignments. You will also take two lab exams that will assess your ability to perform essential calculations and to interpret the kinds of data that you will be collecting throughout the course.

**2.** At the completion of the course, you will know how to prepare yourself in advance for lab procedures. The handouts include information with which you should be familiar before attending lab (*i.e.*, key words, introductory material). Prior to the start of each of the lab exercises, you will take a quiz on your advance preparation.

**3.** At the completion of the course, you will know how to design an experiment to test a specific hypothesis. As part of Lab 4, you will design experiments to test hypotheses regarding (1) diffusion of food dye using Skittles® candies and (2) the relationship between rate of fermentation and the structure of different sugars. You will then carry out the experiments and interpret the data. Both the experimental design and the data analysis are graded.

**Lab Schedule-Fall 2011**

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| --- | --- | --- | --- | --- | --- | --- |
| **Week** | **Tue** | **Wed** | **Thu** | **Lab, Assignments, Quizzes, and Exams** | **Points** | |
| 1 | Aug 30 | Aug 31 | Sep 1 | Lab 1 (Part 1): Microscopy and Measurement  Lab introduction, policies, and safety |  |  |
| 2 | Sep 6 | Sep 7 | Sep 8 | Lab 1 (Part 2): Microscopy: Cells and Organisms  Quiz 1 →  Assignment 1 (Conversions & Measurements) due → | 25  30 |  |
| 3 | Sep 13 | Sep 14 | Sep 15 | Lab 1 (Part 3): Microscopy: Cells and Organisms, cont.  Quiz 2 →  Notebook pages for Lab 1 due →  Assignment 2 (Conversions & Calcs.) due → | 25  30  30 |  |
| 4 | Sep 20 | Sep 21 | Sep 22 | Lab 2: Diffusion and Osmosis  Quiz 3 →  Notebook pages for Lab 2 due →  Assignment 3 (Cells & Sizes) due → | 25  30  30 |  |
| 5 | Sep 27 | Sep 28 | Sep 29 | Lab 3: Photosynthesis: Chloroplasts & Photopigments  Quiz 4 →  Assignment 4 (Diffusion) due → | 25  30 |  |
| 6 | Oct 4 | Oct 5 | Oct 6 | Lab 4 (Part 1): Respiration: Experimental Design Workshop  Lab midterm exam →  Notebook pages for Lab 3 due →  Assignment 5 (Photosynthesis) due → | 125  30  30 |  |
| *Week of Fall Break, Oct 11-13: No Labs* | | | | | | |
| 7 | Oct 18 | Oct 19 | Oct 20 | Lab 4 (Part 2): Respiration: Experimental Procedure  Quiz 5 → | 25 |  |
| 8 | Oct 25 | Oct 26 | Oct 27 | Lab 5 (Part 1): Meiosis and Mendelian Genetics: Flies  Quiz 6 →  Notebook pages for Lab 4 due →  Assignment 6 (Respiration/Fermentation) due → | 25  30  30 |  |
| 9 | Nov 1 | Nov 2 | Nov 3 | Lab 5 (Part 2): Meiosis and Mendelian Genetics: Corn  Quiz 7 → | 25 |  |
| 10 | Nov 8 | Nov 9 | Nov 10 | Lab 5 (Part 3): Meiosis and Mendelian Genetics: Flies, cont.  Quiz 8 →  Assignment 7 (Mendelian Genetics & Corn) due → | 25  30 |  |
| 11 | Nov 15 | Nov 16 | Nov 17 | Lab 6 (Part 1): Molecular Genetics: DNA Restriction  Quiz 9 →  Notebook pages for Lab 5 due → | 25  30 |  |
| *Week of Thanksgiving Break, Nov 22-24: No Labs* | | | | | | |
| 12 | Nov 29 | Nov 30 | Dec 1 | Lab 6 (Part 2): Molecular Genetics: Gel #1 & GMO PCR  Quiz 10 →  Assignment 9 (DNA Restriction & Mapping) due → | 25  30 |  |
| 13 | Dec 6 | Dec 7 | Dec 8 | Lab 6 (Part 3): Molecular Genetics: Gel #2 (GMO PCR)  Lab Final exam →  Notebook pages for Lab 6 & Table of Contents due →  Assignment 8 (Fly Data Analysis) due → | 150  50  60 |  |

**Grading**

**Important Note:** BIO 121 Lecture and BIO 121 Lab grades are assigned separately.

**Point Distribution:**

The due dates and point values for graded work are shown in the Lab Schedule above. You can use the last column to track your points earned.

* Quizzes (best 9 of 10): 25 points each, 225 points total.
* Lab notebook: 200 points total. Unless otherwise stated by your instructor, duplicate copies of your notebook entries will be collected at the completion of each lab unit.
* Lab assignments: 30-60 points each, 300 points total.
* Lab exams (midterm and final): 275 points total.

The final lab grade is based on total points earned (out of a maximum of 1,000):

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | ≥930 | B+ | ≥870 | C+ | ≥770 | D+ | ≥670 | F | <600 |
| A- | ≥900 | B | ≥830 | C | ≥730 | D | ≥600 |  |  |
|  |  | B- | ≥800 | C- | ≥700 |  |  |  |  |

**Student Responsibilities**

**Attendance:** You are required to attend the lab section for which you are scheduled.

* If you must miss lab because of a College-sponsored activity, you must provide documentation *in writing,* in advance, using an official form; otherwise, your absence will be considered unexcused. You must make arrangements with both your regular instructor and the instructor of an alternative lab session to attend lab. Be aware, however, that some lab exercises extend over multiple weeks and that you will usually have a lab partner. In this situation, you must discuss with your regular instructor how this will be handled.
* If you must miss lab for a legitimate, but unforeseen, medical or personal emergency, inform your instructor as soon as possible; your absence will be considered unexcused without notification from the office of the Dean of Student Affairs. If possible, you should make arrangements with both your regular instructor and the instructor of an alternative lab session to attend lab. Be aware, however, that some lab exercises extend over multiple weeks and that you will usually have a lab partner. In this situation, you must discuss with your regular instructor how this will be handled.
* If your absence is not excused, you will forfeit points for notebook entries and assignments associated with the missed lab session. Partial credit for making up this work may be given at the discretion of your instructor.

**Policy on make-up exams:** If your instructor agrees that you missed a lab exam for a legitimate reason (generally associated with notification by office of the Dean of Student Affairs), a make-up exam will be prepared.

**Policy on missed quizzes:** Quizzes are given at the start of the lab session. A student who arrives late will not be given an opportunity to take the quiz and, therefore, will receive a grade of zero.

**Policy on late assignments:** You are expected to turn in assignments at the start of lab on the due date, and an assignment is considered at least one day late if it is not turned in at this time. For each calendar day that an assignment is late (including weekends), 10% of the total value of the assignment (*e.g.,* 2.5 points for a 25-point assignment) will be deducted from your final grade for the assignment.

**Cedar Crest College Honor Code (including the Classroom Protocol):** The Department of Biological Sciences fully supports the Community Standards for Academic Conduct (Section I of the Honor Code), which can be found in "A Student's Guide to Cedar Crest College" on pages 5-8.

**Policy regarding disabilities:** Students with documented disabilities who may need academic accommodations should discuss these needs with their professors during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

**Keeping a Laboratory Notebook**

As a scientist, you will learn that different labs have different requirements for lab notebook entries. In general, the notebook is a chronological record of your lab activities.

The design of the notebook required for this course is such that you can only write on one side of each page in your notebook; a duplicate copy of each page is produced as you make entries. This allows you to keep your notebook while your instructor evaluates your work. Your instructor will let you know when the duplicate pages should be submitted.

You should set aside two pages at the beginning of the notebook for a Table of Contents. While the notebook entries for each lab exercise will be graded separately, an overall grade will also be assigned; leaving out the Table of Contents will lower the overall grade.

In BIO 121, your lab notebook is where you directly record your lab activities. It is bad practice to record activities elsewhere and later enter the information into the notebook; transcription errors can occur. The following information should always be included as you record your activities in your notebook. Your instructor may require additional information.

• The date of the activity

• The names of individuals with whom you are directly working

• A list of objectives (which may include testing a specific hypothesis)

• A chronological record of your activities--this is the major part of your notebook entry & will include:

• specific steps in your laboratory procedure(s)

• calculations (*e.g.,* for making solutions)

• data recorded as they are collected

• A concise summary