

Course Description for Biological Sciences 0050 - Spring, 2003 (03-2)

CO-REQUISITES:

This is the first course of a two-course laboratory series, Biological Sciences 0050 and 0060. BIOSC 0050 runs concurrently with the lecture course, BIOSC 150.

It is strongly recommended that BIOSC 50 and BIOSC 150 be taken concurrently. It is important to know that the lab and lecture components are completely separate courses and the content of the two courses may not overlap directly during the semester. **As a core course, a biology lab typically encompasses a fair amount of work for one credit.**

REGISTRATION:

Each student is registered for a laboratory section that meets once per week. It is important that you only attend the lab for the correct room and the correct time as it appears on your registration. Otherwise, you may not get a grade.

INSTRUCTORS:

There are multiple instructors for this course. It is important that you learn your instructor's name and appropriate phone numbers and email in order to communicate effectively throughout the course. (See Faculty Information below.) Because of the informal setting of the labs, instructors and students are referred to by their first names.

The coordinator for this course is Carole LaFave (L14 Clapp, 412-624-9325, lafave@pitt.edu) and the assistant coordinator is Evelyn Vleck (G2 Clapp, 412-624-4257, evv1@pitt.edu or chavleck@adelphia.net)

COURSE OBJECTIVES:

"Tell me and I'll listen. Show me and I'll understand. Involve me and I'll learn."

Teton Lakota Indian saying

Students will be able to:

- Identify and interpret basic biological concepts through observation and experimentation
- Be efficient in the use of computers and science equipment
- Write key components of a laboratory report.

"What I hear, I forget; what I see I remember; what I do, I understand."

ancient Chinese proverb

REQUIRED MATERIALS:

- Download every lab exercise from *Blackboard*. (Course Documents folder)

The directions for downloading the labs from *Blackboard* will be given to you the first day of class. After the first day, we will no longer have paper copies available. You must download the labs yourself, pre-read the labs, and do the pre-lab assignments before coming to lab. [Note: You must have "Adobe Acrobat" to download the materials. If you do not have Adobe Acrobat, you may download a free copy yourself by going to www.adobe.com or you may pick up a free copy of the "Toolkit" CD which has Adobe Acrobat on it at any of the computing labs on campus. David Lawrence computing lab is a good recommendation.]

*Note: Be patient when downloading the lab exercises. The average length of a lab exercise is approximately ten pages and some reach as many as twenty pages. Allow enough time to download and do not wait until the last minute.

- Purchase an Atlas, "Guide To Biology Lab" at the University Bookstore. The Atlas is about \$14 and will be used for both BioSci 0050 and 0060. [Goggles will be supplied when needed.] You will also need a three-ringed notebook for all the lab exercises.

- 3-ringed binder

In Blackboard you will find buttons that apply to this course :

1) Announcements:

- Course news and weekly announcements
- Events – intradepartmental and interdepartmental

2) Faculty Information: See your instructor and/or other instructors in office hours

- Teaching schedules
- Office hour schedule (Room G9A in Clapp Hall)
- Instructor emails

3) Course Documents:

- **Administrative folder:** includes **Course Description** (course objectives, course format, required materials, policies and procedure; **Syllabus and Assignment Points** (topics, dates, points for assignments, group presentation guidelines)
- **Lab exercises folder:** includes each lab given by name, pre-lab assignments, post-lab assignments and any other information needed .
- **Science Writing** folder: includes guidelines for writing experimental protocols, guidelines for writing concisely, clearly and correctly the sections of a report including Background, Purpose, Hypotheses, Materials/Methods Results, Discussion and Reference

4) Books:

- Only book required to buy "A Guide To Biology Lab" by Rust at the University bookstore
- Campbell textbook (6th ed.) used for reference

5) External Links:

- Biology department links
- University links

COURSE FORMAT:

“All genuine learning is active, not passive. It is a process in which the student is the main agent, not the teacher.” Mortimer Adler, Philosopher

Instructional part in having a positive lab experience:

Over the past year, we have introduced (and are still in the process of introducing) student-based learning in the Foundations of Biology Laboratories (BioSci 0050 and BioSci 0060). In our perspective, student-based learning is education in which investigation and self-motivation by the student are key elements. The instructor’s role in student-based learning is that of facilitator and/or discussion leader rather than lecturer. The educational process is driven by lab exercises which are put online. Many laboratories are designed to be accomplished in a “station format,” that is, the activities are broken down into different topics, and then are spaced at specific areas in the room. The students can then master the concepts

presented at each station before moving to another area. It should be noted that some of the experimental labs listed in the lab schedule are in the more traditional setting. **In all the labs, the scientific method is emphasized and critical thinking is a must!**

Outcomes:

- 1) Students, for the most part, are able to work at their own pace. This alleviates the frustration felt by students who work at a faster pace (or have had extensive background in one particular area), as well as students that work more slowly.
- 2) Students are able to work together and share ideas as they move throughout the lab. Many times this format enables students to work with everyone in the classroom, not just those in their immediate vicinity or within their lab group. Students are encouraged to discuss their ideas with other students as they are conceptualizing.
- 3) Instructors are required to lecture less. This is beneficial to the students, since it effectively permits more time to be spent investigating the lab.
- 4) The station format allows for the easy implementation of updated material, including articles, techniques, etc. Time is spent efficiently; instead of students searching for supplies, they are localized.
- 5) Students seem to be more relaxed, ask more questions, think and discuss their ideas more openly, and grasp the meaning of the scientific method more thoroughly. Students seem to "own the learning" when they come to their own conclusions and puzzle through the exercises.

Student part in having a positive lab experience:

"There are those who think that the speaker has a function to perform, and the hearer none. They think it only right that the speaker shall come with his or her lecture carefully thought out and prepared, while they, without consideration or thought of their obligations, rush in and take their seats exactly as if they had come to dinner, to have a good time while others work hard." Plutarch Moralia, Greek Author

- 1.) Working in groups is practice for life.

Whether you plan on proceeding in pharmacy, a medical science, ecology, chemistry, psychology, or any other major that requires you to take this course, you will discover a basic rule: very few people are successful alone. Exchange ideas. Argue over conclusions. These are the methods by which great, scientific discoveries are made!

- 2.) *"I would advise you to read with a pen in your hand, and enter in a little book hints of what you find that is curious, or that might be useful; for this will be the best method of imprinting such particulars in your memory, where they will be ready."* Benjamin Franklin

Use a notebook or journal for notes. It is also a good idea to put all your lab exercises, pre-lab assignments, etc in the same notebook. Science introduces lots of new vocabulary. Write the words down. Make sketches; take notes; jot down observations that you make during lab; don't depend on your memory. Group presentations will also be required.

- 3.) Learn the "language" of biology but apply what you have learned.

Every career has its own set of vocabulary (jargon). If you plan on speaking to someone in a professional field, it is essential that you are able to communicate effectively. This means not simply memorizing vocabulary but understanding the vocabulary. You should be able to explain biology terms in your own words.

- 4.) Living things die.

Studying biology requires observing living and preserved organisms. It is usually far more exciting to observe living organisms. We make every effort to provide living organisms but recognize that sometimes they will die. In that case, we usually have preserved slides also available.

5.) Real data are messy. (Yes, the word "data" are plural. "Datum" is singular.)

Numbers four and five go together. Animals and plants do not necessarily behave in a consistent manner. Plants wilt, fruit flies escape, enzymes denature, and animals die. Sometimes your hypothesis will not be supportable due not to flawed data collection or erroneous scientific principles, but simply to natural occurrences. You should always try to describe and explain your data. Data are never wrong. Data may just be difficult to interpret at times. Seek help.

6.) Mistakes happen and misunderstandings occur.

Sometimes what seemed obvious in lab will be confusing when completing homework assignments or studying for a test. Instructors are available in office hours throughout the week and students should take advantage of their help when necessary. **You may meet with any instructor for biology lab help. (See "Office Hours")**

7.) Help is available throughout the university.

- "Office of Disability Resources and Services (DRS) provides a broad range of support and services to assist students, faculty and staff with disabilities. Such disabilities may include: visual impairment, auditory impairment, mobility impairment, and hidden disabilities i.e., learning disabilities, ADD, AHD and psychological disabilities." (University Telephone Directory, University Services Guide, 2000-2001, page 67) [216 William Pitt Union, 648-7890]
- "Learning Skills Center offers free learning support services for students, staff, and faculty for math, study skills and reading." (University Telephone Directory, University Services Guide, 2000-2001, page 75) [311 William Pitt Union, 648-7920]
- "Writing Center provides tutorial help with writing. Appointments are recommended. (University Telephone Directory, University Services Guide, 2000-2001, page 96, Thaw Hall)

POLICIES AND PROCEDURES:

Students should be aware that animal dissection is a requirement to complete this course. There will be rat dissection in only one lab, "Animal Anatomy and Physiology." Students are not required to cut but must attend the lab and must observe. Students will be required to view dissected animals on the practical.

Attendance:

You must attend all laboratory sessions to which you have registered. If you miss a lab you must contact Evelyn Vleck (chavleck@adelphia.com or 412-624-4257) and your instructor as soon as possible.

Preparation and Promptness:

- Students are expected to come to lab on time and to be prepared, having downloaded the exercises and read the lab material before class. For some labs you will be required to complete pre-lab protocols. **Pre-labs (4 points) are due at the beginning of lab.** Any work that is not on time will have points deducted.
- Students will receive **2 points for participation** for each lab exercise. The 2 participation points will be granted if:

a student arrives on time; demonstrates proper behavior during lab; participates actively; works effectively with his/her group members; and cleans properly at the end of lab.

Assignments:

"How can I know what I think till I see what I say." Isaac Bashevis, Polish singer and writer

Components: Besides doing a pre-lab assignment you will have assignments which will be graded. See **Syllabus/Assignment folder** for a list of assignments and points on assignments graded. **The lab exercises that you download will be used in lab and will not be graded.** Material for the two practicals will come from all the content of the lab exercises downloaded from Course Documents and *Science Writing*. It is extremely important that you work on the lab exercises diligently to understand all the material for the practicals and assignments.

Late Assignments:

Assignments, both pre-lab and post-lab, are considered late if turned in after class starts. **Pre-lab assignments will not be accepted if not turned in at the time of your lab. You will have one point deducted if you come to class late and hand in the pre-lab assignment late. The first late post-lab assignment will have 1 point deducted per day (including Saturdays and Sundays), the second late assignment will have 5 points deducted per day and the third late assignment will not be accepted.** No assignment more than one week late will be accepted. If you do not turn in your assignment during class, you are responsible for making sure that your Instructor receives the assignment. Late assignments should be put in the "Late Assignment Box" outside of G13 Clapp, but you should always ask your instructor at the following class period about the late assignment. **We try our very best to make sure that late assignments are given to your instructor. If an assignment gets lost, we are not responsible for assignments that are not handed in during your scheduled lab time.**

Exams:

There are two exams in this course. Each is a laboratory practical exam.

What is a practical exam?

A practical exam consists of 18 stations with several questions at each station. Each student starts at a different station and then moves to the next station after the announced number of minutes. This procedure continues until all 18 stations have been visited once by every student.

What's on a practical exam?

On a practical, you are responsible for the information in the lab exercises. In addition, you are responsible for the following general skills: graphing, hypothesis writing, hypothesis evaluation, and data interpretation (anything under *Science Writing*). You will be asked to apply your knowledge to new situations, not only the ones studied in lab.

- Terms/concepts: know its meaning, structure, function, purpose, location, or process by which it is formed
- Equipment: know how to use a piece of equipment; also know its parts and their functions
- Chemicals/chemical tests: know what the chemicals do, how the chemicals work, and what the chemicals test for
- Structures: be able to identify the structures and functions on a diagram or a microscope slide
- Formulae/equations/mathematical concepts: know how to do basic statistical problems, chemistry problems and any other related mathematical problems associated with this course

Note: If you have documentation that you have been identified as having a learning disability, you may have to make arrangements with your instructor to take the exam at a different time. Notify your instructor two weeks before the exam.

When are the practicals given?

Both exams will be held during your regularly scheduled lab period. Consult your **Syllabus** for the specific dates of these exams.

Grading:

Components:

Your grade will be determined by the points you earn on: pre-labs, assignments, post-lab assignments, participation points, and 2 practical exams. Assignments may include individual *Science Writing* assignments. Instructors will make every effort to provide positive and effective feedback on your assignments. **Both students and instructors should make every effort to discuss this feedback in a positive, supportive, and professional manner.**

Final grades:

The letter grade will be determined at the end of the semester determined by the percentage of points you earn during the semester. During the semester, you can make a rough estimate of your provisional grade using the following scale: 90's = A range; 80's = B range; 70's = C range; 60's = D range; 50's or below = failing. Your final grade may include a plus or a minus. In each section, final grades are determined by the individual instructor and course coordinator.

Office Hours and Appointments with Instructors:

Person to person:

If you need help with any material from this course you can receive it from any of the multiple instructors teaching this course. Each instructor will hold office hours in G9A Clapp. Times will be listed on an *Office Hour Schedule* posted in the lab room and outside G9A Clapp. In G9A, you may review some of the material from the lab and you may receive help on your lab exercises and your assignments. "Help" does not always mean giving you the answers. It means helping you to arrive at your own answers. Please note that instructors are not responsible for what you choose to write as your final answer.

Academic Integrity and Student Code of Conduct:

Student Code of Conduct: [<http://www.pitt.edu/~osaweb/usjs/code.html>]

Academic Integrity: [<http://www.pitt.edu/~graduate/ai1.html>]

The following is a synopsis of the guidelines on student obligations:

A student has an obligation to exhibit honesty and to respect the ethical standards of the academic community in carrying out his or her academic assignments. Violations of these standards include: providing other students with assistance on examinations or quizzes; accepting such assistance; acting as a substitute for another person during an examination or quiz; any other form of deceit with respect to an examination or quiz; copying part or all of an assignment completed by another; providing part or all of such an assignment for copying by

others; any other form of plagiarism; and conduct that infringes on the rights of the instructor and fellow students.

Plagiarism is using someone else's ideas as your own in your reports. If you use someone else's exact word, you should put quotation marks around them and cite them. Plagiarism is a serious academic offense and can result in failure of the assignment, the course, and other university censures.

COURSE SAFETY AND SOCIAL RESPONSIBILITY

To avoid injury to yourself and fellow students and to provide a climate that is conducive for all students to learn, you are required to adhere to the following rules. Failure to comply with these rules while performing laboratory experiments may result in suspension or expulsion from this laboratory course.

- **If you have a problem or condition that may affect your performance or safety in the laboratory you should discuss it in private with your Laboratory Instructor or the Laboratory Coordinator. This information will be held in strict confidence.**
- **YOU MUST WEAR APPROVED SAFETY GOGGLES or SAFETY GLASSES AT ALL TIMES** during the specified labs. It is a legal requirement of the Commonwealth of Pennsylvania that eye protection be worn in university teaching and research laboratories. **YOU MAY NOT WEAR CONTACT LENSES** in the laboratory. Failure to comply with these rules will result in your dismissal from lab for the day, and continued noncompliance could result in an F in the course.
- **YOU MUST WEAR CLOSED-TOE, FULL SHOES AT ALL TIMES IN THE LABORATORY.** Sandals, of any type, are not allowed in lab. Failure to comply with this rule will result in your dismissal from lab for the day. **YOU MAY NOT WEAR CUT-OFF TEE SHIRTS, MIDRIFF TOPS, HALTERS, MINI-SKIRTS, SHORTS OR SHORT PANTS IN A TEACHING LABORATORY.** If you are dressed inappropriately for lab, you will be dismissed from lab for the day and you may not be able to reschedule.
- You **MAY NOT PIPET** any solution **BY MOUTH**. If you get any chemicals on your hands **WASH YOUR HANDS IMMEDIATELY**. Plenty of running water is the best first aid for all chemical accidents. Rapid and immediate treatment is essential. Clothing soaked with strong acid or alkali must immediately be removed. This is no time for modesty. The safety showers are mainly intended to be used in cases where corrosive chemicals are spilled or splashed over a large body area.
- **You must put on gloves before helping anyone who is bleeding.**
- Note the location of eye fountains and safety showers so that you can use them if needed. Eye injuries, whether chemical or mechanical, must always be considered to be serious. The best procedure, **IN CASE OF CHEMICAL INJURY TO THE EYE IS IMMEDIATE, PROLONGED, CONTINUOUS FLUSHING WITH WATER** (15-20 minutes) at an eye fountain. Eyes must be forced open to be washed well.
- **NEVER EAT, DRINK, OR SMOKE IN THE LABORATORY.** Long hair must be confined securely to minimize hazards.
- Never force glass rods, pipets, or tubing into rubber stoppers. Always use a lubricant (grease or glycerin) and protect hands with a towel. Use proper technique and care when inserting a pipet into a pipet bulb.
- **DO NOT RUN** or "horse around" in the laboratory. Do not engage in any activities or behavior which might confuse, startle, or distract another student.
- **DO NOT PUT BACK ANY CHEMICAL, SOLID OR LIQUID, INTO THE STOCK BOTTLES** from which they were obtained. The excess chemical may now be contaminated. Ask your Instructor what to do with the excess chemicals. **REPLACE STOPPERS**, lids, covers, etc. on

the proper containers immediately after using the containers. **NEVER REMOVE** chemicals from the laboratory. Clean up chemical spills immediately. Check with your Instructor for the proper procedure.

- **IF A FIRE ALARM SOUNDS** while you are working in the laboratory, turn off any Bunsen burner, hot-plate stirrer or other electrical appliance; remove any reaction from any heat source; and leave the building by the nearest exit.
- An Instructor must always be present while students are working in the laboratory. **YOU ARE NOT PERMITTED TO DO UNAUTHORIZED EXPERIMENTS.**
- Always leave your work area clean at the end of each lab. **WASH YOUR HANDS BEFORE YOU LEAVE LAB.** It is a good idea to wash your hands whenever they have been in contact with any chemical, not just at the end of the lab period.
- **NOTIFY YOUR INSTRUCTOR IMMEDIATELY** in case of any accident or spill. Give cracked or chipped glassware to your Instructor and obtain replacements from the supply bench. Broken glassware **MUST BE PLACED IN THE "BROKEN GLASS" BOX ONLY.** For treatment of any accident you must go to Presbyterian University Hospital. Transportation will be provided if needed - speak with your Instructor. You and your Lab Instructor together must file an Accident Report within 24 hours. Except in very unusual circumstances, all medical claims are the responsibility of the student. **INSURANCE COVERAGE** by either a student plan or family plan is strongly recommended.
- **Put on gloves before helping another student if a blood injury occurs.**

You must at all times display appropriate behavior in the lab. "Politeness protocol" will be followed in the lab between instructor and student and among all the students. Diversity among individuals regarding race, age, gender, sexual orientation, religion, ethnicity, class, and ability will be respected and will follow the guidelines established by the University and Department of Biological Sciences.

If you agree with the above policies, sign this form and give it to your instructor.

Student's Name _____ Date _____

Instructor's Name _____ Date _____

Syllabus folder: Topics/Dates/Assignments for Biological Sciences 0050 – Spring (03-2)

Week of January 6-10: Lab exercise #1: Measurement

Introduction to the course on *Blackboard*. Instructions will be given to you
Lab #1 - *Measurement* lab exercise will be given to you.

What's due next week: Administration: (Download items from the *Course Documents* folder in *Blackboard*.)

1. Read the Course Description that you were introduced to in lab.
2. Bring in a signed safety sheet found on the last page of the Course Description.

Scientific content:

3. Pre-lab for *Cell I* (also download and read *Cell I*)-found under *Course Documents*
4. Do *Measurement Practice Problems* (self-graded, no points assessed - download from *Blackboard* - one copy has answers and one copy does not) You need to know how to do these problems for the first practical.)

Week of January 13-17: Lab exercise #2: Cell I – Cell Structure & Function

Lab covers microscopy and cell structure and function. This is an observation lab. Bring all the assignments listed under Lab Exercise #1. Make sure you have downloaded and read *Cell I*. Make sure you bring your Atlas (*A Guide to Biology Lab*) by Rust to this lab.

What's due in 2 weeks:

- *Pre-lab for *Cell II Membranes* (You will need to read "*How to write an experimental protocol*" under *Science Writing* to do this pre-lab. Also, download and read all of *Cell II*)
- *Read all information found in the *Science Writing* folder.

Week of January 20-24: Review of Science Writing and Excel

Because of the Monday holiday, (University is closed on Monday) we will not have a traditional lab class period. Wednesday (9AM & 1PM), Thursday (1PM), and Friday (9AM) instructors will be in G7 during the entire lab period time. Although you are not required to come, I encourage you to attend because you will use these skills throughout the semester.

Week of January 27-31: Lab exercise #3: Cell II – Organic Molecules

This lab covers organic molecules as they relate to cell structure and function. This is the second part of the *Cell* lab and it is an experimental lab. You will be expected to evaluate data qualitatively. Bring all the assignments listed under *Cell I* and download and read Lab #4. Bring your Atlas.

What's due next week:

- *Pre-lab for Lab #4 – *Diffusion and Osmosis*

Week of February 3-7: Lab exercise #4: Cell III – Diffusion & Osmosis (Not on Practical I)

You will be expected to evaluate data quantitatively by using Excel graphing for homework and by writing a description of your data. Bring all assignments listed under *Cell II*. **The Lab #4 – *Diffusion & Osmosis* exercise material will not be on the first lab practical because you will not have received feedback from your assignment.**

What's due next week:

1. Writing assignment - write a *Results* section for Lab #4 – *Diffusion & Osmosis*

Week of February 10-14: Lab exercise #5: Cells/Tissues/Organs-Plant Anatomy (On Practical I)

You will do an observational lab studying plant tissues and vegetative organs. Bring your Atlas.

What's due in two weeks:

1. Pre-lab for *Enzymes I* (experimental protocol) - also read whole document

Week of February 17-21: Practical #1 during regularly scheduled lab times

The first practical will cover all exercises from Exercise 1, "*Measurement*" through Exercise 5, "*Plant Anatomy*." **NOTE: EXERCISE #4: *DIFFUSION & OSMOSIS* WILL NOT BE ON THE FIRST PRACTICAL.** You may also be asked to answer questions referring to topics from *Science Writing*. Refer to your *Course Description* if you have questions about "*What is a practical exam?*"

Note: Only questions regarding the Exercise #4 assignment will be addressed in Office Hours this week.

Week of February 24-28 : Lab exercise #6: Enzymes I

This lab is the first of a two week experimental lab. The second week each group will be assigned their own variable to study. It is important the first week that you understand all the procedures and theory in order to do the *Enzymes II* lab.

What's due next week:

1. Pre-lab for *Enzymes II* (experimental protocol) - also read whole document
2. In two weeks, each group will do a brief presentation on their variable and the data collected during lab.

Week of March 3-7: No class – Spring Break

Week of March 10-14: Lab exercise #7: Enzymes II

You will collect data and write a Results/Discussion section after this lab.

What's due in two weeks:

1. Do a *Results/Discussion* assignment for the Enzymes II lab.

What's due next week:

2. Pre-lab *Respiration*- download and read entire lab.

Week of March 17-21: Lab exercise #8: Respiration

You will do an experimental lab studying aerobic and anaerobic respiration.

What's due next week:

1. Pre-lab *Photosynthesis* - download and read entire lab.

Week of March 24-28: Lab exercise #9: Photosynthesis

You will do an experimental lab studying photosynthesis. Bring in your *Enzymes II* Results/Discussion assignment.

What's due next week:

1. Pre-lab *Animal Anatomy & Physiology I* - (download and read entire lab.)

Week of March 31 – April 4: Lab exercise #10: Animal Anatomy & Physiology I

You will do an observational lab studying the structure and function of animal tissues and organs. Bring your Atlas.

What's due next week:

- *Pre-lab *Animal Anatomy & Physiology II* - (download and read entire lab.)

Week of April 7-11: Lab exercise #11: Animal Anatomy & Physiology II

You will continue the observational lab that covers the structure and function of animal tissues and organs. Bring in all assignments listed under *Animal Anatomy & Physiology I*. Bring your Atlas.

Week of April 14-18: Practical #2 during regularly scheduled lab times

The second practical will cover all exercises from Exercise 4, "*Membranes*" through Exercise 12, "*Anatomy and Physiology II*." You may also be asked to answer questions referring to topics from *Science Writing*.

Note: There will be no office hours this week.

Late Assignments:

- Assignments are considered to be late if turned in after class starts. The first late assignment will have one (1) point deducted per day (including Saturdays and Sundays.) The second late assignment will have five (5) points deducted per day, and the third late assignment will not be accepted. No assignment more than one week late will be accepted.
- If you do not turn your assignment in during class, you are responsible for making sure your Instructor receives the assignment. Late assignments should be put in the 'Late Assignment Box' that is located outside of G-13 Clapp Hall. **It is your responsibility to follow up and determine if your Instructor received the assignment. We are not responsible for assignments that are not handed in during your scheduled lab time.**
- Pre-lab assignments **will not be accepted** if not turned in at the time of your lab. You will have a minimum of one (1) point deducted if you are late to class and turn in the pre-lab assignment late.

Point Totals:

<u>Assignment</u>	<u>Possible Points</u>	<u>Your Points</u>
Pre-lab <i>Cell I</i>	4	
Pre-lab <i>Cell I – Organic Molecules</i>	4	
Pre-lab <i>Cell III – Diffusion & Osmosis</i>	4	
Practical I	90	
Pre-lab <i>Enzymes I</i>	4	
Results – <i>Membranes</i>	20	
Pre-lab <i>Enzymes II</i>	4	
Group presentation – <i>Enzymes II</i>	5	
Results/Discussion – <i>Enzymes II</i>	20	
Pre-lab <i>Respiration</i>	4	
Pre-lab <i>Photosynthesis</i>	4	
Pre-lab <i>Animal A&P I</i>	4	
Pre-lab <i>Animal A&P II</i>	4	
Group presentation	10	
Practical II	90	
Total Participation Points	20	
Total	291	

Guidelines for Group Presentations:

- Each group will be responsible for one group presentation that will be worth ten (10) points. Your instructor will assign each group a presentation for **one** lab (Cell II, Membranes, Enzymes I, Enzymes II, Respiration, and Photosynthesis.) In addition, **all groups** will do a five (5) point presentation on the results they obtain for Enzymes II. The following requirements must be followed for full credit. (Separate instructions follow for the group assigned to present Enzymes II.)
- Your group will be responsible for the introduction and summary of the lab. The introduction should include a short background on the subject plus all of the components shown in the experimental protocol. The summary should include a discussion of the results.

Introduction:

Purpose
Hypotheses (Alternative and/or null hypotheses)
Predictions (multiple predictions)
Rationale (for each prediction)

Summary:

Results (with tables and figures, if possible.)
Discussion (explanation of the results)

Enzymes II:

- If your group is assigned Enzymes II, you should understand that all groups (including yours) will be doing an experiment on different variables. Each group will write a different experimental protocol. Therefore, your group should give an introduction that includes an overview of all of the experiments in Enzymes II (*i.e.* pH, temperature, enzyme concentration, substrate concentration, and inhibitor concentration.)
- The overview for Enzymes II should include:
- **Background** of each independent variable (from the lab exercise in your own words)
- **Purpose** of investigating each independent variable
- **Alternative hypothesis** and/or **null hypothesis** for each independent variable
- **** You do not have to include a predication or rationale for each independent variable.**

For all presentations:

- Each student must do their own experimental protocol. Only on the day that your group is presenting may the protocols be identical.
- Each group member must contact the other group members to decide on the approach of the group presentation. The presentation should be no longer than 10-15 minutes in length, **total**.
- Remember, your group must also include a short background. Information may be taken from the lab exercise, but it may **not** be plagiarized.
- Both clear and prepared transparencies are available, and should be used. Ask your instructor for details.

Note: Prepared transparencies should not leave the lab rooms at any time; there will be paper copies for you to use for your preparation.

II. Enzymes II Summary, all groups

- All groups will present a summary of the results they obtained for their independent variable. Transparencies of the tables will be provided. All groups should indicate absorbance results; if possible, rates of reaction should be calculated.