PIKEVILLE COLLEGE
COURSE REQUIREMENT FORM
FALL TERM 2008

BIO 151: PRINCIPLES OF BIOLOGY I **Credit Hours**: 4

Official Course Description: The hypothetico-deductive nature of scientific inquiry is introduced and is used as a foundation for the exploration of cellular organization and function. Topics covered include atomic bonding, the structure and importance of water to life, macromolecules essential to life, enzyme kinetics, eukaryotic cell structure, cellular respiration, photosynthesis, cell division, an introduction to Mendelian genetics, and the structure and function of DNA. Although the course focuses on the cellular level and below, the importance of these structures and processes to the organism is continually considered. *Pre- or Corequisite: MTH 111 or placement beyond. Recommended: One year of high school biology or chemistry and co-registration in CHE 113.*

Instructor: Joe Whittaker

Office: ARM 105

Office Phone: 218 - 5467

email: jwhittak@pc.edu

Division Phone: 218 - 5460

MWF 9:00 – 9:50
Lecture Room: ARM 213
MWF 1:00 – 1:50
Lecture Room: ARM 103
Tuesday Lab: 3:00 – 5:50
Wednesday Lab: 3:00 – 5:50
Thursday Lab: 8:00 – 10:50
Lab Room: ARM 113

Office Hours: See attached schedule or by appointment.

Pre-or Corequiste: MTH 111 (or placement beyond)

Required Textbook: Campbell, N. A., and J. B. Reese. 2008. Biology. 8th Edition. Benjamin/Cummings. Menlo Park, CA.

Morgan, J. G., and M. E. B. Carter. 2008. Investigating Biology. 6th Edition. Benjamin/Cummings. New York.

Taylor, M. R. 2008. Student Study Guide for Biology. 7th Edition. Benjamin/Cummings. Menlo Park, CA.

Goals and Objectives: Principles of Biology is designed for students interested in **majoring** in life sciences. We will be discussing key principles and concepts that will serve an important foundation for the life sciences. You will be given an introduction to fundamental scientific laws and principles of the life sciences which will serve as building blocks in future more specialized courses. A sufficient understanding of science allowing you to read, converse, and make responsible decisions about personal and societal issues will be provided. Your ability to comprehend, translate, and express scientific information in symbolic form will be developed. An understanding of the validity and self-correcting

nature of scientific methods will be explained. Writing assignments will expose you to current literature and aid you in the process of critical thinking. You will begin to develop skills in the use of laboratory techniques such as microscopy and basic experimentation. Laboratories are designed to provide you with hands-on study of topics introduced in lecture.

Specific **learning outcomes** for this course include:

(1) use and explain the scientific method to answer questions and design experiments; (2) describe the characteristics of living things explaining the role of atoms, elements, molecules, ions, and compounds within biological systems; (3) describe the components of cells and describe a basic understanding of cellular metabolism including cellular respiration and photosynthesis; (4) explain the central dogma of biology involving the reproduction of cells, inheritance, and the development of new organisms.

The material we will discuss in this course is **cumulative** by its very nature. It is therefore critical for you to have a good understanding of the material early in the semester to provide a basis for you to comprehend the later material.

My goal is to present a course that provides an opportunity for each and every student to master the material and to obtain a grade of "A." Unfortunately I can not learn the material for you. I will do my best to present the material in a way that facilitates learning. I will provide objectives, and have chosen a text which is readable and presents concepts in an understandable manner. I strive to make the course as fair as possible. However, the bottom line is that you must do the rest and learn the material.

Here are some suggestions to help you master the material:

1. Come to class ready to learn and put your energy into getting an idea of what I am talking about. Reading the chapter **ahead of time** begins the learning process earlier and provides a context for, and allows you to synthesize, the material presented in class.
2. Lecture is a time when concepts are explained in a manner that complements and builds on what is in the book. Thus you can take notes to emphasize material presented in the book.
3. I will provide you with objectives and summary points. The **night after the lecture** you should review your notes (while things are still fresh in your mind) and use the text to fill in gaps you may have missed. You should also review to see how the notes and the text match the objective and summary points.
4. As the test approaches ask yourself questions about the objective and summary points (also try the book questions and quiz other students) write out your answers and make detailed study guides.
5. As a study aid, I have placed an excellent CD, The Chemistry of Life on reserve at the library. This CD covers several chemistry topics of use for this class. It is a particularly good tool if you have difficulty "visualizing" the chemistry topics we will be discussing. It is full of animations and has quizzes as well as a final exam. It is well worth the time to go over (and may help with chemistry classes too).

Attendance Policy: Attendance in lectures is not required. However, if absences become excessive (without valid excuses) points will be deducted from your final grade, or in extreme cases a grade of "Q" or "F" will be assigned. I strongly recommend you attend class. There is a **strong positive correlation** between lecture attendance and final course grade. While attendance will not formally count for points in the course, students who attend class regularly will be given extra consideration in the case of a borderline final grade. If you miss a lecture you are responsible for getting the material you missed. If you know ahead of time (athletic activities, non-emergency doctor's appointment, etc.) that you will be missing an assignment, you must contact the instructor at least **24 hours** in advance concerning your absence in order to make arrangements to make-up any missed assignments. You must make-up any missed assignments either before your absence or before the next class meeting. Any work missed because of a valid emergency absence (must be accompanied by a written excuse, (e.g., physicians note, etc.)) must be made-up as soon as possible after your return.

Laboratory attendance will count for ~10% of your final laboratory grade. Unexcused laboratory absences will result in loss of points. Missing **four** or more labs, without a valid, college recognized excuse, will **result in a grade of F in the course**. You **must attend your assigned lab period**. If you must miss a lab we may make **prior** arrangements to attend the other section. Students will not be permitted to just show up to the alternate section. This will be **strictly enforced during laboratory exam weeks**.

Laboratory Safety. You will be given and must complete a laboratory safety form to participate in labs. Additionally, you are going to be required to provide personal protective equipment (PPE) for labs. This includes **approved goggles and gloves**. These PPE may not be required for every laboratory period, but you are responsible for having them with you to participate in labs that require them. Not being able to participate in lab because of a failure to bring PPE is considered an unexcused absence.

Goggles: The following is required for laboratory settings.

1. Must be indirect vent and provide splash protection.
2. Must not have fabric or foam around edges that can absorb liquids and hold it next to the wearer's skin.
3. Must meet the ANSI Z87.1-2003 safety impact standard.
4. Strong recommendation to purchase from Pikeville College's bookstore or the Biology Club.
5. No admittance to the lab without approved goggles (if the specific lab requires goggles).

Gloves: The following is required for laboratory settings.

1. Must be appropriate for the current exposure to the hazardous chemical.
2. For splash or intermittent contact protection, a disposable Nitrile glove 9.5" long and 4 mil thick is recommended for most situations. Students will have to purchase disposable gloves.
3. Strong recommendation to purchase from Pikeville College's bookstore or the Biology Club.
4. No admittance to the lab without approved gloves (if the specific lab requires gloves).

In the event you must miss a lecture or lab exam you must contact me <u>BEFORE</u> the exam. If you miss a test or other assignment due to an emergency (illness, etc.), you must have a valid written excuse

(physician's note, etc.). Any exam missed without notifying me or without a valid excuse **will be assigned a grade of "0" on the exam**. A word of warning: make-up exams will not be identical in content or format to original exams (often in essay format and therefore may seem more difficult than the original examination). Typically make-up exams are given during finals week. Lab exams are practical in nature and as such missed lab exams **CAN NOT** be made up.

Grading Policy and Scale:

Grades will be based on the following:

1. Three lecture exams (~130 points each)
2. Cumulative lecture final exam (~225 points)
3. Two laboratory exams (~120 points each)
4. Laboratory Quizzes (10 points each)
5. Lab notebook (including diagrams) (20 points)
6. Lab attendance (25 points)
7. Writing assignments (30 points total)
8. Additional homework assignments/quizzes

Your grade will be based on your percentage* of the total points as follows:

Percentage	Grade
$\geq$ 90	A
80-89	B
70-79	C
60-69	D
$\leq$ 59	F

* Your percentage = Your total points / Total number of points possible

Lecture exams will be of variable format. This may include a combination of, but is not limited to, multiple choice, true/false, matching, short answer, and brief essays. Lecture exams from the previous year will be on reserve at the library. Use these old exams as "study guides" with the understanding I will not be asking the same questions in the same way. Do not fall into the trap of studying the old exams and expecting to see the same questions. The final lecture exam will be cumulative. Lab exams will typically be composed of both practical (objective) and written questions.

Your lab books will be initialed by your lab instructor twice during a lab. Prior to lab you must write out the lab objectives. You will not be allowed to participate in lab until the objectives in your lab book are initialed by your instructor. Prior to leaving lab, you will have your written results and conclusions initialed as well. The laboratory notebook will be turned in and graded following each lab exam. I will be grading notebooks on organization, clarity, and effectiveness as a study aid. I expect you to make your own diagrams and observations notes from experiments in lab. I will not be grading you based on artistic ability.

> ****** You **MUST** pass the lab (based on the points earned of the total points available in the laboratory) with at least a 60% in order to pass the entire course. A laboratory grade lower than 60% will result in an overall failing grade for the entire course!

You will be asked to turn in 6 article reviews. The first three should come from popular literature (newspapers, popular magazines {e.g., Newsweek, Time, National Geographic, Smithsonian}, etc. [NOT primary literature]). These first three should pertain to current biological issues. The next three should come from primary literature (scientific, peer-reviewed journals). You may need to get these through interlibrary loans so plan ahead. You may get copies of the article from the internet but websites themselves are **not** appropriate sources. Each article review should consist of one or two paragraphs describing what the article is about and a concluding paragraph explaining the significance and relevance of the article (your review should not exceed 2 pages). Your written article reviews must be accompanied by a copy of the article. I will require **two copies** of your written review. Reviews must be **typed** and **stapled** to the article for you to be eligible for full credit. All articles must have been published **after 1 May 2008**.

Assignments are due at the **beginning** of the class period unless otherwise specified. Late assignments will be penalized 10% per day (starting with – 10% after the assignments are collected in class).

If you withdraw from this course after the last day to receive a "W", I will have to assign a grade of "WP" (withdraw passing) or "WF" (withdraw failing). Do not expect to automatically get a grade of "WP." I will look at your percentage of the available points **at the time you drop** the course and make a determination of whether you are passing or failing the course. **All** assignments and exams prior to your dropping the course will be included in this calculation.

Tutoring: Free tutoring is available for any class through the Tutoring Center in Allara Library, Room 001. Tutoring is also available free of charge through the ACE Program, but you must apply for acceptance to the ACE Program. The ACE Program is located on the first floor of Armington. For free assistance with writing assignments there is the Writing Center in Allara Library, Room 013.

Academic Dishonesty: Pikeville College views academic dishonesty as cheating, plagiarism, fabricating, or facilitating academic dishonesty. **I will not tolerate any instance of academic dishonesty**. Science depends on the integrity of those contributing to it. As such, instances of plagiarism or academic dishonesty will result in either: the student receiving a failing grade for the activity or receiving a failing grade for the course, according to the perceived intent and extent of the instance(s) of academic dishonesty. This policy will be **rigidly** enforced. Copying portions of your article reviews word-for-word from the source article or copying from a friend or the internet is

plagiarism. Please see the Pikeville College Course Catalog or ask me if you have questions about academic dishonesty. It is your responsibility to understand what constitutes academic dishonesty.

Vandalism, intentional destruction and theft of Pikeville College property (including specimens, models, slides, or facilities) and/or endangering other people through negligent or irresponsible behavior will result in your immediate dismissal with a grade of "F" for this course and may result in legal action by Pikeville College.

Tentative Schedule for BIO 151

DATE	TOPIC	CHAPTER
20 August	Introduction – Exploring Life	1
22	Chemistry of Life	2
25	Chemistry of Life	2
27	Water and the Fitness of the Environment	3
29	Carbon and Molecular Diversity of Life; Macromolecules	4 & 5
1	**LABOR DAY**	
3 September	Carbon and Macromolecules **(Article 1)**	5
5	An Introduction to Metabolism	8
8	A Tour of the Cell	6
10	Cell	6
12	Membrane structure and function	7
17	**EXAM 1**	
19	Cell Respiration: Harvesting Chemical Energy	9
22	Cell Respiration: Harvesting Chemical Energy	9
24	Photosynthesis **(Article 2)**	10
26	Photosynthesis **(Last day to drop with grade of W)**	10
29	Cell Communication	11
1 October	The Cell Cycle (Mitosis)	12
3	The Cell Cycle (Mitosis)	12
6	Meiosis and Sexual Life Cycles	13
8	**EXAM 2**	
10	Meiosis and Sexual Life Cycles	13
13	Mendel and the Gene Idea	14
15	Mendel and the Gene Idea **(Article 3)**	14
17	**FALL HOLIDAY**	
20	The Chromosomal Basis of Inheritance	15
22	The Chromosomal Basis of Inheritance	15
24	The Molecular Basis of Inheritance	16
27	DNA Structure	16
29	DNA Structure **(Article 4)**	16
31	DNA Replication	16
3 November	DNA Replication	16
5	DNA Replication	16
7	**EXAM 3**	

10	From Gene to Protein	17
12	From Gene to Protein	17
14	From Gene to Protein	17
17	Transcriptional regulation and mRNA processing	17
19	Transcriptional regulation and mRNA processing **(Article 5)**	17
21	Transcriptional regulation and mRNA processing	17
24	Translation	17
26	**THANKSGIVING BREAK**	
28	**THANKSGIVING BREAK**	
1 December	Translation	17
3	Microbial Models: the Genetics of Bacteria and Viruses **(Article 6)**	18
5	Catch up and review	
	FINAL EXAM: SECTION A-C: WEDNESDAY 10 DECEMBER, 9:00 AM **SECTION D-F: FRIDAY 12 DECEMBER, 1:00 PM**	

Tentative Lab Schedule for BIO 151. Section A, Tues. Section B, Wed. Section C, Thurs.

WEEK OF	TOPIC	Lab #
25 August	Introduction and Scientific Investigation	1
1 September	Enzymes	4
8	Microscopes and Cells **(QUIZ)**	2
15	Diffusion and Osmosis	3
22	Cellular Respiration and Fermentation **(QUIZ)**	5
29	Photosynthesis	6
6 October	**LAB PRACTICAL I (MIDTERM)**	
13	**NO LABS – FALL HOLIDAY**	
20	Mitosis and Meiosis	7
27	Heritability & Introduction to Electrophoresis	Handout
3 November	Mendelian Genetics: *Drosophila* **(QUIZ)**	9
10	Molecular Biology & DNA Electrophoresis	10 & Handout
17	Population Genetics I **(QUIZ)**	11
24	**THANKSGIVING WEEK -- NO LABS**	
1 December	**LAB PRACTICAL II (FINAL)**	

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Disclaimer: The schedules and policies associated with this course may be subject to revision or change as a consequence of changing circumstances or events. Reasonable notification will be provided to students prior to any major changes in course policies or procedure.

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American Disabilities Act (ADA) Policy:

Pikeville College works to ensure that students with disabilities receive appropriate accommodations in accordance with the requirements of the American Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973. Students with disabilities requiring accommodations should contact the Disabilities Resources Office located in the Student Services Counselor's Office. Accommodations are made on an individual basis according to documented need. Additional information can be found in the College Catalog and the Student Handbook.

Contact Information:

Kathy Petot
Disabilities Resource Office/Student Counselor's Office
kpetot@pc.edu
Administrative Building (Lower Level)
(606) 218-5232

Individuals who have any disability, either permanent or temporary, which might affect their ability to perform in this class are encouraged to inform me (the instructor) at the start of the semester. Methods, materials, or testing may be modified as required to provide for equitable participation of students with documented needs.

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Course Requirement Sheet Acknowledgment Form

I _____ have received a copy of the Requirement Sheet for BIO 151,
(Printed Name)
Principles of Biology I, and understand all the policies and procedures outlined therein.

_____ _____
(Signature) (Date)

Please fill out the optional information requested below:

Major: _____

Contact Phone Number: _____

E-mail Address: _____

Medical information that the instructor should be aware of:

Hometown:

Career interests or goals:

Reasons for taking this course:

Previous biology background (high school and college):

USE OF PHOTOGRAPHIC LIKENESS RELEASE

For good and valuable consideration, I authorize Dr. Joseph Whittaker to record photographs of me and use, reproduce, modify, distribute, and exhibit such photographs, in whole or in part, without restrictions or limitation for marketing and instructional purposes.

I release Dr. Whittaker, Pikeville College, its successors and assigns, agents, and all persons for whom it is acting from any liability by virtue of any blurring, distortion, alteration, optical illusion, or use in composite form, whether intentional or otherwise, that may occur or be produced in the photographic process and waive any right that I may have to inspect or approve the finished recordings.

_____

Printed Name

_____

Signature Date