

**Course:** Biology I

**Room:** 105B

**Instructor:** Mr. King

**Description:**

Throughout the year you will be studying various introductory level concepts and themes that dominate the field of biology (see course outline). This class will consist of mostly hands-on activities, projects, and experiments designed for **you** to have time to explore important concepts. Make the most of your lab time. Creativity and imagination are key components of the course and are highly valued. You are encouraged to work and collaborate with others during your investigations. We may or may not cover all of the topics on the outline. It is only a guide to let you know what direction we are going.

**Textbook:**

Miller, K.R., Levine, J. 1995. *Biology*. Prentice Hall, NJ. The textbook is to be used as a reference for study and for homework assignments. Do not bring your textbook to class unless told otherwise.

**Grading:**

Be sure to turn in all of your homework assignments, labs, and quizzes. There will be the opportunity to earn many points during the marking period. The purpose of this is to allow for mistakes on exams. The tests will be designed to challenge you.

Keep track of your grades by recording them on your course outline. Simply add the number of points you have earned and divide by the total possible. Do not ask for Mr. King to figure out your grade; do it yourself. Quizzes will follow specific chapter assignments and lab activities and will almost always be due on a Friday. Exams will be given at the end of a unit.

If you are absent frequently, you will have to make up the labs on your own time by appointment (study hall or before or after school). No back work (homework, labs) will be accepted, unless you have missed school and have a legal excuse.

You are required to keep a bio-folder, which you must bring to class everyday. A bio-folder is simply a folder where you store graded assignments such as labs, activities, projects, homework, and quizzes, and any notes you take. It has four purposes: a great study guide for a unit exam, a way to track your grade during the marking period, proof you did an assignment if Mr. King makes a mistake, and finally a great way to study for the final exam! Keep your course outline in your bio-folder. Your bio-folder may be checked at the end of each marking period.

You will take a comprehensive final exam in this academic class. In the past, the final exam counted as one half of a marking period. The policy has changed and the weight of your final will be an entire marking period. In other words, the final exam will have a big impact on your grade for the course. If you have any questions refer to your student handbook.

**Grading scale:**

93% -100% = A  
85% - 92% = B  
77% - 84% = C  
68% - 76% = D  
≤67% = E

**Assignment weight:**

Labs/activities	20 points
Quizzes	10 points
Homework questions	20 points
Projects	will vary (20-30)
Exams	100

## Classroom rules:

1. **Safety** is number one. Please follow all safety rules (see safety rules contract). This entails following safety precautions. Absolutely **no horseplay**.
2. The first 5 minutes and last five minutes of class are **my time**. This means everyone is in their roll-taking seats and quiet.
3. Due dates for all assignments will be posted on the dry erase boards. **No late work** will be accepted without an excused absence.
4. You must **clean-up** before you leave.
5. You are encouraged to work with lab partners, and to do so quietly. If you and your lab partner are not staying on track or are disruptive you may be reassigned to another group.
6. If you are disruptive during class you will simply be asked to leave and you will be given a zero for the lab or activity. If you are asked to leave three times you will be referred to the administration.

## School Policies:

1. School policy states that if you are late three times you will be referred to the administration.
2. Use of electronic devices is prohibited (cell phones, I-pods, headphones, digital cameras). I will confiscate any devices and turn them in to the office.
3. Make sure you are dressed appropriately – students will be referred to the administration if in violation of school policy.

## Course Outline: Biology I

### Unit I: Introduction to Biology

#### Nature of Science

**Lab:** How chemicals affect seed growth.

**Activity:** tabloid science?

Textbook: Chapter 1

#### Safety in the Laboratory

**Activity:** Safety contract

Textbook: Chapter 1

#### Metric system

**Lab:** Using SI

Textbook: Chapter 1

Quiz

#### Laboratory equipment

**Activity:** Laboratory equipment

**Activity:** Use of the compound microscope

**Activity:** Better techniques of the compound microscope

**Activity:** Measurement of the microscopic field

Textbook: Chapter 2

Quiz

#### Bioethics

**Activity:** Bioethics debate project

Unit exam

### Unit II: Background Chemistry

#### The chemical basis of life

**Activity:** Bohr model and bonding

Textbook: Chapter 3

Quiz

pH, acids and bases

**Lab:** pH

**Lab:** pH and proteins

Textbook: Chapter 4

Organic chemistry

**Activity:** Carbohydrates

**Activity:** Lipids

**Activity:** Proteins

**Lab:** Identifying organic compounds

Textbook: Chapter 4

Quiz

Unit exam

Unit III: The Cell

Cell structure and function

**Activity:** Why are cells so small?

**Project:** cell poster

**Activity:** Virtual cell

Textbook: Chapter 5

Cell diversity

**Lab:** Eukaryotes vs. Prokaryotes

Cell membrane

**Lab:** Diffusion

**Lab:** Osmosis

Textbook: Chapter 5

Quiz

Cell energy: photosynthesis/cellular respiration

**Activity:** history of the discovery of photosynthesis

**Activity:** yeast respiration

**Lab:** respiration/photosynthesis experiment, Vernier Probes

Textbook: Chapter 6

Quiz

Unit exam

Unit IV: DNA/RNA, The molecule of life

Chromosomes

**Lab:** Karyotypes

**Lab:** Chromosome spreads

**Lab:** Dipping for DNA

Textbook: Chapter 7

Quiz

Cell division

**Lab:** Mitosis

**Activity:** Time for mitosis

Textbook: Chapter 8

Quiz

DNA: replication, transcription, and translation

**Activity:** DNA/RNA

**Activity:** Candy DNA

**Activity:** Protein synthesis

**Activity:** Proteins and words

Textbook: chapter 7

Quiz

**Project:** Biography of a woman or minority biologist

## Unit V: Genetics

### Heredity

**Activity:** Problems: monohybrid crosses

**Activity:** Problems: dihybrid crosses

**Activity:** Meiosis

**Activity:** Human traits

**Activity:** Personal traits

**Lab:** Corn genetics

Textbook: Chapter 9

Quiz

### Gene interactions

**Activity:** Problems: multiple alleles

**Activity:** Problems: sex linkage

**Lab:** Blood type

**Lab:** Alkaptonuria

**Activity:** Problems: incomplete dominance/codominance

**Activity:** Name that Gene, National Institute of Health

**Activity:** Genetics Project

Textbook: Chapter 10&11

### Pedigrees

**Activity:** Human pedigrees

**Activity:** Pedigree studies

Textbook: Chapter 11

Quiz

### Biotechnology

**Activity:** Murder and genetics

**Lab:** Gel electrophoresis: DNA fingerprinting

Textbook: Chapter 12

Unit Exam

## Unit VI: Natural Selection and Biodiversity

### Biodiversity

**Lab:** Dinosaurs

Textbook: Chapter 13

Quiz

### Natural Selection

**Lab:** Bird Beak

**Activity:** Rat Island

**Activity:** Physical anthropology

**Activity:** Fossil evidence

**Lab:** Moths

Textbook: Chapter 14

Quiz

### Classification

**Lab:** Skins and Skulls

**Activity:** Classification

**Activity:** Biopoem

Textbook: Chapter 15

Quiz

**Lab:** Wildflowers

**Activity:** Leaf forms

**Lab:** Trees

Textbook: Chapter 22, 23

**Lab:** Animal kingdom

Textbook: Chapter 26, 27, 28, 29, 31, 32, 33

**Lab:** Fish

**Lab:** Macroinvertebrates

Textbook: Chapter 28

Quiz

Unit Exam

#### Unit VII: Microbiology

Bacteria and viruses

**Lab:** The sizzler

**Lab:** Bacterial warfare

**Lab:** Bugs among us

**Lab:** Bacteria traits

**Lab:** Antibiotics

**Activity:** HIV

**Lab:** Common cold

**Lab:** Virus replication

Textbook: Chapter 17

Quiz

Unit Exam

#### Unit VIII: Ecology

Predator/Prey

**Activity:** Lynx and hare

Textbook: Chapter 48

Invasive species

**Activity:** The problem with aliens

Endangered species

**Activity:** Endangered species fact sheet

Ecosystem

**Activity:** Energy sources

**Activity:** Ecosystem poster

**Activity:** Ecosystem fact sheet

Textbook: Chapter 47

Public Lands:

**Activity:** Public lands

Secondary Data: computer lab

**Lab:** USGS

GIS/GPS

**Lab:** PSU geography speaker

Agriculture

Tour of Best Management Practices Farm

Watershed Study

**Study:** Reeds Gap State Park

Textbook: 49

Unit report

Global Warming

**Activity:** Website review

Unit IX: Body Systems

Animal Dissection

**Lab:** fetal pig