SCHOOL OF STEM SYLLABUS

TERM:

INSTRUCTOR:

COURSE CODE: BIO-115

OFFICE HOURS:

COURSE TITLE: Principles of Biology I

OFFICE LOCATION:

DAY(S) AND TIME(S):

EMAIL:

LOCATION:

PHONE:

COURSE PREREQUISITE: ENG-101 AND MAT-100 OR MAT-114

CREDITS: 4

COURSE DESCRIPTION:
Principles of Biology 1 is a lecture and lab course that address some fundamental concepts and applications of biology. In this course students will learn the chemical context of life and the structure and function of large molecules like DNA. Students will also learn the cell structure, function and how processes such as photosynthesis, metabolism and cell cycle take place inside the cell. This course will also give students a clear understanding of some molecular and genetic concepts such as Mendelian inheritance and transcription & translation inside a cell.

STUDENT LEARNING OUTCOMES:

Upon completion of this course, the following objectives will be achieved:

1. Differentiate the living from living, the eukaryotic vs prokaryotic cells. Define homeostats, ecosystem and the components of scientific methods.
2. Distinguish between atoms and molecules; elements and compound; protons, neutrons, electrons, and define compounds and acid/ base.
3. Differentiate between the molecules of life as carbohydrates, saturated and unsaturated fatty acids, proteins, nucleic acids and distinguish the different levels of structures and their diverse functions.
4. Describe the structure of cells as the fundamental unit of life, organelles structure and function, animal versus plant cells, the microscope application with the cell.
5. Recognize the cell membrane and its regulations of different mechanisms such as, osmosis, diffusion and active transport.
6. Differentiate metabolic process such as anabolic, catabolic reactions and recognize the roll of enzymes in those reaction and the different forms of energy used. Describe photosynthesis in plant cells.

STEM STUDENT HUB
Information & Resources tailored towards students taking any STEM courses
STEM Magnified | STEM Syllabi | Clubs & Organizations | Scholarships & Organization | Internships & Work | Upcoming/ Past Events | Current STEM News | Career Coach Research Guides And More!

7. Describe the cell cycle mechanisms mitosis, meiosis and their important for living cells and their regulations and important.
8. Recognize the concepts of Mendel inherited experiment. Define homozygous, heterozygous, genotype and phenotype, the chromosomal basis of inheritance. Discuss the ethical issues that surround the release of bioengineered organisms.
9. Recognize DNA/ RNA structure and describe the DNA replication mechanisms, transcription and translation from DNA-RNA-proteins and mutations.

TEXTBOOK AND SUPPLEMENTAL MATERIALS:

Reece, Jane B, Campbell, Neil A, Cain, Michael L. Campbell Biology 11th Edition. Pearson. ISBN-13: 9780134093413

Judith G Morgan & M. Eloise Carter. Investigating Biology- Laboratory Manual 9th Edition. Pearson. ISBN13: 9780134473468

GRADING POLICY:

Two Lecture Exams	20 points
Two Lab Exams	20 points
Lab Reports	10 points
Assignment	10 points
Midterm Exam	15 points
Final Comprehensive Exam	25 points

Lab Format: Unless indicated otherwise, each laboratory exercise is set up for team of four-five students. Each student on the team is to participate in every aspect of the lab exercise. After each exercise, a formal lab report is handed in for grading. The lab reports are written (word processed) individually, not as a team, and handed in during the next lab session. You are required, by department policy, to follow all safety procedures. Each lab team is responsible for cleaning up their work area after every lab.

Make up exams will be given only in extenuating circumstances. It is your responsibility to let me know that you missed an exam. All make up exams are more difficult than the original.

SAMPLE COURSE SCHEDULE:

Week	Lecture Topic	Lab Topic	L O
1st	Introduction to the course. Evolution, The Themes of Biology & Scientific Inquiry.	Lab Safety Orientation Scientific Investigation ASI: Scientific Method Assignments	1
2nd	The Chemical Context of Life Water and Life.	Microscopes& Acid base ASI: Chemical Bonds	2
3rd	Carbon and the Molecular Diversity of Life. The Structure and Function of Large Biological Molecules.	*Micropipting activity* *Macromolecules handout* *ASI:Structure of Biological Molecules*	2
4th	A Tour of the Cell. Chapter 4	Cells organelles structure ASI:Different cells	**3**
5th	Membrane Structure and Function. Chapter 7	Diffusion & Osmosis ASI:Plasma Membrane	3
6th	Introduction to Metabolism.	Lab Exam I	4
7th	Cellular Respiration Photosynthesis.	*Enzymes*	*5*
8th	Midterm Exam		1-5
9th	The Cell Cycle.	*Mitosis Lab* *ASI: Cell Cycle*	6
10th	Meiosis and Sexual Life Cycles.	Meiosis lab	7

		ASI:Meiosis and genetic Variability	
11th	Mendel and the Gene Idea.	Mendelian Genetics Blood type	7
12th	The Chromosomal and Molecular Basis of inheritance.	Gel Electrophoresis with dye. ASI: Sex Linked	8
13th	The Molecular Basis of Inheritance	DNA extraction & Electrophoresis ASI: DNA replication	9
14th	From Gene to Protein	Lab Exam II ASI: Steps of transcription	9
15th	**Final Exam**		

HCCC POLICIES, STATEMENTS, AND SERVICES:
https://www.hccc.edu/administration/academic-affairs/syllabus-addendum.html