

	<u>Date</u>	<u>Initials</u>
Division/School Approval:	1/16/2020	TMC
Curriculum Committee Approval:	2/14/2020	TSG
Senate Approval:	2/28/20	VO

SUNY SCHENECTADY Course Outline

ACADEMIC DIVISION/SCHOOL: Math, Science, Technology, and Health

PREPARED BY: Syeda Munaim

COURSE CODE: BIO 141 **COURSE TITLE:** Biology I

LECTURE HOURS/WEEK: 3 **LAB HOURS/WEEK:** 3 **CREDIT HOURS:** 4

PREREQUISITE(S): None

PREREQUISITE or CONCURRENT COURSE: None

COREQUISITE: None

COURSE DESCRIPTION:

This is the first semester of a two semester sequence designed for science majors which explores the central concepts of modern biology. This course focuses on the concepts of cell structure and physiology, genetics, transport mechanisms, bioenergetics, DNA structure and function, and processes such as cell reproduction, photosynthesis, and cellular respiration. The laboratory portion of the course consists of topics correlating with the lecture. NOTE: High school biology and chemistry or the equivalent taken within the last five years are required for this course.

	SUNY SCHENECTADY S-CORE COURSE	SUNY GENERAL EDUCATION COURSE
APPROVED CATEGORY 1	Scientific Literacy	Natural Science
APPROVED CATEGORY 2	Choose an item.	Choose an item.
RECOMMENDED CATEGORY 1	Choose an item.	Choose an item.
RECOMMENDED CATEGORY 2	Choose an item.	Choose an item.

STUDENT LEARNING OUTCOMES:

Students who have successfully completed this course will have:

- described structure and function of cells including major cellular processes;
- implemented direct observation techniques of plant, animal, and microbial specimens;
- conducted a scientific investigation having applied the scientific method and authored a laboratory report;
- demonstrated knowledge of microscope, cellular, and molecular experimental techniques; and
- described and identified the structure, significance, and role of DNA.

REPRESENTATIVE TEXT(S):

TITLE	AUTHOR(S)	PUBLISHER
OpenStax Biology 2 nd edition, Biology 2e		OpenStax CNX
Symbiosis/Investigating Biology	Munaim, S.I.	Pearson, Boston, MA
SPECIAL NOTES:		

COURSE MATERIALS:

Textbook web site, journal articles, online work

NOTE: Grading and assessment criteria may appropriately differ. Grades focus on what individual students have learned while assessments focus on entire cohorts of students. Each instructor will determine his/her grading criteria for the course and state on the course syllabus.

EVALUATION METHODS:

Exams, laboratory practicals, laboratory reports in a journal format, written assignments, online work

REQUIRED ASSESSMENT METHODS:

Assessment results from these methods will be used for course-level assessment and, where applicable, for SUNY Schenectady S-Core principles and SUNY General Education Knowledge and Skills areas. This information will be incorporated in program reviews.

STUDENT LEARNING OUTCOME	METHOD(S)
Described structure and function of cells including major cellular processes	Examination
Implemented direct observation techniques of plant, animal, and microbial specimens	Laboratory practical
Conducted a scientific investigation having applied the scientific method and authored a laboratory report	Laboratory report
Demonstrated knowledge of microscope, cellular, and molecular experimental techniques	Laboratory practical
Described and identified the structure, significance, and role of DNA	Examination

COURSE CONTENT OUTLINE:**NOTE:** College policy requires a final exam or final week activity.

WEEK(S)/HOUR(S)	TOPIC
1	Exploring Life The Chemical Context of Life Inorganic Chemistry (Properties of Water)
2	Organic Chemistry (Carbon and Functional Groups) Structure and Function of Macromolecules
3	Structure and Function of Cells
4	Structure and Function of Cells Continued Membrane Structure and Function
5	Metabolism
6	Cellular Respiration
7	Photosynthesis
8	The Cell Cycle, Mitosis, and Other Asexual Reproductive Mechanisms
9	Meiosis and Sexual Life Cycles
10	Mendelian Genetics
11	Mendelian Genetics/Human Inheritance
12	Non-Mendelian Genetics/Human Inheritance
13	From Gene to Protein: An Overview
14	Genomics DNA Replication
15	Proteomics Transcription and Translation
16	Comprehensive Final Exam

LAB CONTENT OUTLINE:

LAB WEEK	TOPIC
1	Scientific Methods Scientific Writing; Writing Lab Reports Microscopes and Cells
2	Introduction to Chemistry and Macromolecules
3	Enzymes
4	Diffusion and Osmosis
5	Pigment Analysis and Spectrophotometry
6	Prokaryotes and Eukaryotes
7	Practical Exam
8	Mitosis and Meiosis Mendelian Genetics
9	Bacterial Transformation
10	Plasmid Isolation
11	Restriction Enzymes
12	Gel Electrophoresis and Analysis
13	Review
14	Final Practical Exam