

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**

COURSE OUTLINE

BIOL 101 - Introduction to Biology

Prepared By: W. David Barnes

**SCHOOL OF SCIENCE, HEALTH & PROFESSIONAL STUDIES
SCIENCE DEPARTMENT
May 2015**

BIOL 101 - Introduction to Biology

- A. **TITLE:** Introduction to Biology
- B. **COURSE NUMBER:** BIOL 101
SHORT TITLE: Intro to Bio
- C. **CREDIT HOURS:** 4
- D. **WRITING INTENSIVE COURSE (OPTIONAL):** N/A
- E. **COURSE LENGTH:** 15 weeks
- F. **SEMESTER(S) OFFERED:** Fall, Spring
- G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**

One 50 minute computer tutorial section, two 50 minute lectures per week and one 110 minute laboratory session per week.

- H. **CATALOG DESCRIPTION:**
A study of the major concepts in the life sciences presented for the non-major. Subjects covered include an overview of the basic concepts of plants and animals, including human biology, with attention given to cellular processes and the relationship between form and function.

- I. **PRE-REQUISITES/CO-COURSES:** None

- J. **GOALS:**

By the end of this course, the student will be able to:

Course Objective	Student Learning Outcomes
1. Define biology and life, organizing living things by the current taxonomic system; Understand the scientific method and be able to identify proper experimental design, controls and variables; Describe the composition, function, form and mode of synthesis of the four types of macromolecules.	2.Critical Thinking 3.Professional Competence

<p>2. Understand the cell theory, distinguish between prokaryotic and eukaryotic cells and identify and describe the function of sub cellular components; Describe the composition and function of the plasma membrane and analyze the different mechanisms of transport across the plasma membrane; Describe the structure, function, role and control of enzymes in cellular metabolism; Identify the starting products, end products, energy carriers and location of different metabolic pathways, including the Krebs cycle, electron transport chain, glycolysis and fermentation. Understand the role of enzymes in mediating metabolic reactions. Compare and contrast aerobic and anaerobic metabolism; Compare and contrast light-dependent and light-independent reactions. Describe the role and function of the chloroplast and its component parts in photosynthesis. Identify the overall reaction of photosynthesis.</p>	<p>2.Critical Thinking 3.Professional Competence</p>
<p>3. Describe the structure, function, synthesis of DNA and the steps involved in protein synthesis, including transcription and translation; Understand the mode of inheritance and apply knowledge to solve problems related to heritability of alleles. Describe how errors in meiosis can lead to chromosomal abnormalities; Explain the cell cycle, chromosome structure, binary fission and cytokinesis, diploid and haploid cells. Name and describe the events of mitosis and meiosis, connecting these events to growth, repair, sexual and asexual reproduction.</p>	<p>2.Critical Thinking 3.Professional Competence</p>
<p>4. Describe the evidence for evolution and natural selection.</p>	<p>2.Critical Thinking</p>
<p>5. Show the relationship between cells, tissues, organs and organ systems. Compare and contrast the characteristics and functions of the four major tissue types.</p>	<p>2.Critical Thinking 3.Professional Competence</p>
<p>6. Apply the scientific method in the conduct of laboratory exercises; develop proficiency with laboratory equipment, techniques, and methodology; apply biological data and draw meaningful conclusions (lab).</p>	<p>1. Communication 2. Crit. Thinking 3. Prof. Competence</p>

K. TEXTS:

Textbook: Singh-Cundy, Anu & Cain, Michael L. *Discover Biology*, Fifth Edition, Norton Publishing, 2012

Study Guide: Singh-Cundy, Anu & Cain, Michael L. *Discover Biology Study Guide*, Fifth Edition, Norton Publishing, 2012

Lab Manual: Curro, Myler and Stewart, *Introduction to Biology Laboratory Experiments*, 10th Edition, SUNY Canton Press, 1999

Smith and Schenk, *Dissection Guide and Atlas to the Fetal Pig*, 2nd Edition, Morton Publishing Company, 2003

L. REFERENCES: None

M. **EQUIPMENT:** NONE

N. **GRADING METHOD:** A-F

O. **MEASUREMENT CRITERIA/METHODS:**

Exams

Lab Practicum Exams

Final Exam

Weekly online quizzes

Angel participation

P. **DETAILED TOPICAL OUTLINE:**

Week	Lec #	Lecture	Chapter	
1	OL 1	Online: Introduction to Angel and Course		
1	1	Introduction to Course		
1	2	Science in the Real World	1	
2	OL 2	Online: Atoms, Molecules, & Cells		
2	3	Chemistry of Life	2	
2	4	Biological Molecules/	3	
3	OL 3	Online: Cell & Plasma Membrane		
3	5	Cell & Plasma Membrane	4-5	
3	6	Exam Unit 1	1-5	
4	OL 4	Online: Introduction to Energy		
4	7	Introduction to Energy	6	
4	8	Body with Energy	7	
5	OL 5	Online: Photosynthesis		
5	9	Photosynthesis	8	
5	10	Photosynthesis	8	
6	OL 6	Online: Review		
6	11	Review Activities		
6	12	Exam 2 Unit 2	6-8	
Mid Term	7	OL 7	Online: Genetics	
	7	13	Mitosis	9
	7	14	Meiosis	10
8	OL 8	Online: Inheritance		
8	15	Mendel	11	
8	16	Genetics/Inheritance	12	
9	OL 9	Online: DNA		
9	17	DNA Structure	13	
9	18	Exam 3 Unit 3	9-13	
10	OL 10	Online: Proteins/Biotechnology	14-15	
10	19	How Proteins are Made	14	
10	20	Biotechnology	15	
11	OL 11	Online: Introduction to Evolution	16-17	
11	21	Evolution/Micro	16	

11	22	Evolution/Macro	17
12	OL 12	Online: Macroevolution	18
12	23	Macroevolution	18
12	24	Exam 4 Unit 4	14-18
13	OL 13	Online: Human Anatomy	
13	25	Body and Systems	25
13	26	Transport and Exchange	28
14	OL 14	Online: Reproduction	29
14	27	Reproduction	29
14	28	Exam 5 Unit 6	25,28,29
15		Finals Week	

P. DETAILED LAB OUTLINE:

1	Safety and Microscope - the parts and use of the microscope	4-12
2	Plant Cells: Study of plants cells using the microscope and models.	13-20
3	Animal Cells- the study of animal cells using the microscope and models.	21-28
4	Practicum I: Exam covering material in labs 1-3. Energy Requirement & BMR	Insert
5	Photosynthesis: Study of photosynthesis and the isolation of photosynthetic pigments using paper chromatography.	46-52
6	Enzymes- study of enzyme structure and function using starch digestion by amylase as an example.	41-45
7	Osmosis and Diffusion- study of the processes of diffusion and osmosis using artificial membranes and living cells	29-34
8	Inheritance- study of inheritance, including performing monohybrid crosses and use of blood typing to illustrate concepts of inheritance.	53-60
9	Practicum II: covers material from labs 4, 6-9. Heart Physiology - study of heart physiology, including circulation of blood through the heart, the intrinsic conduction system, heart rate, pulse rate, blood pressure and the effect of exercise	68-73
10	DNA Extraction- DNA will be extracted from wheat germ and/or cheek cells Mitosis- study of mitosis, including microscopic examination of dividing plant and animal cells.	78-82 61-67
11	Fetal Pig Dissection I	74-77
12	Fetal Pig Dissection II	74-77
13	Fetal Pig Dissection III	74-77
14	Practicum III- exam covering material in labs 10, 11, 14	
15	Finals Week	