



North Central State College  
MASTER SYLLABUS  
2020-2021

- A. Academic Division: Health Sciences
- B. Discipline: Biology
- C. Course Number and Title: BIOL1230 Biology I
- D. Course Coordinator: Justin Tickhill  
Assistant Dean: Melinda Roepke, MSN, RN
- Instructor Information:
- Name: [Click here to enter text.](#)
  - Office Location: [Click here to enter text.](#)
  - Office Hours: [Click here to enter text.](#)
  - Phone Number: [Click here to enter text.](#)
  - E-Mail Address: [Click here to enter text.](#)
- E. Credit Hours: 4  
Lecture: 3 hours  
Lab: 3 hours
- F. Prerequisites: ENGL0040 & MATH0084 (minimum grade of C- required for all) or qualifying placement test scores
- G. Syllabus Effective Date: Fall, 2020
- H. Textbook(s) Title:
- Campbell Biology with Mastering Biology*
- Author(s): Reece, Urry, et al.
  - Copyright Year: 2017
  - Edition: 11th
  - ISBN: 9780134093413
- I. Workbook(s) and/or Lab Manual:
- Investigating Biology Laboratory Manual*
- Author(s): Morgan and Carter
  - Copyright Year: 2017
  - Edition: 9th
  - ISBN: 9780134473468
- J. Course Description: This course is an introduction to biology for bioscience majors and students planning to transfer to four year institutions. The course will introduce fundamental concepts of biology including the scientific method, structure and chemical properties of cells. The course will introduce students to biochemical pathways, bioenergetics, and basic concepts of genetics, heredity and homeostasis. Historical contributions and application of biological principles to biotechnology will be discussed. Students will meet three lecture hours and three lab hours per week

K. College-Wide Learning Outcomes

College-Wide Learning Outcomes	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Describe the scientific method; characterize its strengths and limitations. Illustrate the scientific method in the analysis of major biological discoveries	Quizzes throughout term Mid-term and final exam
2. Describe basic structure of the atom, and the bonds formed by atoms and the proportion of elements found in living things. Describe the properties of carbon and the basic ways organic molecules are constructed	Homework assignments, Quizzes throughout term Mid-term and final exam
3. Describe the basic chemical and physical properties of water that make it essential for life	Quizzes throughout term Mid-term and final exam
4. Be able to name and describe the principle properties of lipids, proteins, carbohydrates, and nucleic acids and the importance in biological systems.	Quizzes throughout term Mid-term and final exam
5. Discuss the relationship of chemical processes to cellular processes of living things	Quizzes throughout term Mid-term and final exam
6. Discuss energy harvesting reactions for production of organic molecules in photosynthesis, including membrane organization of energy harvesting complexes.	Quizzes throughout term Mid-term and final exam
7. Demonstrate how living things harvest energy by enzymatic breakage of chemical bonds of organic molecules, and the main biochemical pathways in cellular respiration and fermentation.	Quizzes throughout term Mid-term and final exam
8. Describe the process of energy transfer through biological systems	Quizzes throughout term Mid-term and final exam
9. Describe the general structure, function and reproduction of eukaryotic cells, prokaryotic cells and viruses	Quizzes throughout term Mid-term and final exam
10. Describe the steps of the cell cycle and stages of mitosis and meiosis and the significance of meiosis in sexual reproduction	Quizzes throughout term Mid-term and final exam
11. Illustrate the role of DNA in heredity how DNA is organized and expressed in cells, and basic concepts in genetics including phenotypic expression, and the role of gene regulation and mutation on gene products and on phenotype	Quizzes throughout term Mid-term and final exam
12. Describe the basic principles of development	Quizzes throughout term Mid-term and final exam
13. Relate how cells have evolved mechanisms for communicating, coordinating, and regulating activities. Compare mechanisms within and across species, Apply knowledge of regulatory mechanisms to explain aberrant cell behavior and diseases	Quizzes throughout term Mid-term and final exam
14. Discuss the historical development in biology including contribution of significant figures, and evolution of theories in biology	Quizzes throughout term Mid-term and final exam

Outcomes	Assessments – How it is met & When it is met
15. Document the solution to scientific problems through the collection, organization, analysis and interpretation of qualitative and quantitative data. Incorporate findings into broader context of biological knowledge	Lab reports, Quizzes throughout term Mid-term and final exam
16. Apply current research literature, information related to biological issues in the mass media	Lab reports, Quizzes throughout term Mid-term and final exam
17. Integrate and relate knowledge to real life situations	Quizzes throughout term Mid-term and final exam
18. Illustrate use of Recombinant DNA technologies and genomics	Quizzes throughout term Mid-term and final exam

M. Topical Timeline (Subject to Change):

WEEK	CONTENT
1 & 2	Process of Science Biological organization Scientific Method Strengths and limitations Properties of living things
3, 4, & 5	Principle Biological Molecules and their properties <ul style="list-style-type: none"> <li>• Atoms elements and chemical</li> <li>• Bonds</li> <li>• Major biological molecules Lipids, protein, nucleic acids, carbohydrates</li> <li>• Importance of water in biological systems</li> </ul>
6, 7, 8, & 9	The Cell <ul style="list-style-type: none"> <li>• Cellular structure and function</li> <li>• Cellular membrane and organelles</li> <li>• Cellular respiration</li> <li>• Photosynthesis</li> <li>• Cellular Reproduction cell cycle, mitosis, meiosis binary fission, viral reproduction</li> </ul>
10, 11, 12, & 13	Genetic Basis of Life <ul style="list-style-type: none"> <li>• Mendelian Genetics</li> <li>• Chromosomal Patterns of Inheritance</li> <li>• DNA Structure and Function</li> <li>• Gene Activity and Mutations, role in evolution, cancer</li> <li>• Biotechnology and Genomics</li> </ul>
14 & 15	Cells to tissues <ul style="list-style-type: none"> <li>• Cells form tissues and organs</li> <li>• Organismal Development</li> </ul>
16	Final Exam

Lab - Weeks will correspond to Lecture Material Presentation Time Schedule

1. Scientific Method
2. Chemical composition of cells
3. Enzyme Function
4. Cells/Microscopy
5. Diffusion/Osmosis
6. Cell Respiration and fermentation
7. Photosynthesis
8. Mitosis/Meiosis
9. Mendelian Genetics

10. Population genetics
11. Molecular Biology/PCR
12. Bioinformatics
13. Biotechnology
14. Development

Note: A homework component after each lab, students are expected to design a “next step” experiment to reinforce the concepts using scientific method.

N. Course Assignments:

1. Homework Assignments
2. Quizzes
3. Mid-term Exam
4. Final Exam

O. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00-59	F	0.00	Failure

P. Grading and Testing Guidelines:

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Q. Examination Policy:

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R. Class Attendance and Homework Make-Up Policy:

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S. Classroom Expectations:

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T. College Procedures/Policies:

**Important information regarding College Procedures and Policies can be found on the [syllabus supplement](#) located at**

**<http://catalog.ncstatecollege.edu/mime/download.pdf?catoid=5&ftype=2&foid=3>**