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**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

1. 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 |
| 1. 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 |
| 1. Describe the basic chemical and physical properties of water that make it essential for life | Quizzes throughout term  Mid-term and final exam |
| 1. **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 |
| 1. **Discuss the relationship of chemical processes to cellular processes of living things** | Quizzes throughout term  Mid-term and final exam |
| 1. 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 |
| 1. **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 |
| 1. **Describe the process of energy transfer through biological systems** | Quizzes throughout term  Mid-term and final exam |
| 1. **Describe the general structure, function and reproduction of eukaryotic cells, prokaryotic cells and viruses** | Quizzes throughout term  Mid-term and final exam |
| 1. **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 |
| 1. **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 |
| 1. **Describe the basic principles of development** | Quizzes throughout term  Mid-term and final exam |
| 1. **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 |
| 1. **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 |
| 1. **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 |
| 1. **Apply current research literature, information related to biological issues in the mass media** | Lab reports, Quizzes throughout term  Mid-term and final exam |
| 1. **Integrate and relate knowledge to real life situations** | Quizzes throughout term  Mid-term and final exam |
| 1. **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   * Atoms elements and chemical * Bonds * Major biological molecules Lipids, protein, nucleic acids, carbohydrates * Importance of water in biological systems |
| 6, 7, 8, & 9 | The Cell   * Cellular structure and function * Cellular membrane and organelles * Cellular respiration * Photosynthesis * Cellular Reproduction cell cycle, mitosis, meiosis binary fission, viral reproduction |
| 10, 11, 12, &13 | Genetic Basis of Life   * Mendelian Genetics * Chromosomal Patterns of Inheritance * DNA Structure and Function * Gene Activity and Mutations, role in evolution, cancer * Biotechnology and Genomics |
| 14& 15 | Cells to tissues   * Cells form tissues and organs * Organismal Development |
| 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**](http://catalog.ncstatecollege.edu/mime/download.pdf?catoid=5&ftype=2&foid=3) **located at**

[**http://catalog.ncstatecollege.edu/mime/download.pdf?catoid=5&ftype=2&foid=3**](http://catalog.ncstatecollege.edu/mime/download.pdf?catoid=5&ftype=2&foid=3)