BIO 105  Introduction to Biology  3 credits + lab

I. Bulletin Description:

An introductory course designed to give the student a broad experience in the biological sciences for both science majors and non-majors. The following concepts will be covered: scientific method, basic biochemistry, biomolecules, cell structure and function, mitosis, meiosis, cellular metabolism, basic genetics, evolution, biodiversity, and a survey of the five Kingdoms of life. This course together with BIO 105A, meets the General Education science requirements, and is also recommended to prepare science majors for upper level biology courses.

II. Prerequisites, Pre/Co-requisites, Co-requisites, Recommended:

BIO 105 has a co-requisite laboratory class-BIO 105A that enhances the information and concepts discussed in this course.

It is highly recommended that students have tested out of ENG 096, ENG 098, and MTH 095 through their COPASS assessment session. The rationale for this recommendation is based from the instructor’s classroom experience with students that have challenges with reading comprehension, basic writing skills and math. The unprepared student struggles with understanding the science texts, terminology and concepts.

III. Rationale for Course Level:

The study of biology connects us to the world we are living in and reminds us of our interconnectedness with all other life forms. It develops awareness of the significance of fauna and flora and diverse ecosystems. It provides opportunities to learn about the processes of all living things. What students learn is directly relevant to our species and environment.

IV. Suggested Textbooks:


V. Other Requirements and/or Materials for the Course:

Protective eye goggles and carbonless lab journal
VI. **Student Learning Course Objectives:**
After successful completion of this course, the student will be able to:

**Lecture:**

- Summarize how living organisms interact with one another and their environment including how energy flows through an ecosystem and between matter cycles and organisms.

- Recognize that all organisms are composed of one or more cells that are made of molecules, come from preexisting cells, and perform life functions including the fundamental chemistry of living cells, and the flow of energy and matter in cellular function. Connect this organ and organ system function in plants and animals.

- Describe how genetic information coded in DNA is passed from parents to offspring by sexual and asexual reproduction, and describe the significance of “The Central Dogma”

- Recognize that biological diversity is a result of evolutionary processes by relating principles of evolution to biological diversity, and classification of organisms into a hierarchy of groups based on similarities that reflect their evolutionary relationships.

- Compare and contrast Indigenous understanding of the natural world to traditional Western biology approaches.

**Lab course:**

- to carry out basic biological laboratory activities safely and reliably
- to collect, organize, analyze, interpret and present quantitative and qualitative biological data utilizing the scientific method
- to effectively work with others in the laboratory

**Institutional Learning Goals:**

Students will demonstrate:

1. Demonstrate competency in reading, writing, oral communication, and numerical literacy
2. Be able to evaluate information
3. Consider multiple perspectives from the diversity of human experience
## Suggested Course Outline:

<table>
<thead>
<tr>
<th>Week</th>
<th>Readings</th>
<th>Subject</th>
<th>Assignments &amp; Exams</th>
<th>L O</th>
<th>Lab Exercise</th>
<th>Lab Assignment</th>
<th>L O</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Chap 1</td>
<td>Intro to biology &amp; Life-“Bimaatisiwin”</td>
<td>Reflection paper on discussion</td>
<td>Lab Safety, Rules &amp; Making Sci Measurements</td>
<td>Lab Safety Quiz Measurement worksheet</td>
<td>Lab Assignment</td>
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<tr>
<td>2</td>
<td>Chap 2</td>
<td>The Chemical Basis of Life-</td>
<td>Reading quiz</td>
<td>pH of Various Sol’ns: The Microscope</td>
<td>Bring 5 samples Prediction tables</td>
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<tr>
<td>3</td>
<td>Chap 3</td>
<td>The Organic Molecules</td>
<td>Concept quiz</td>
<td>Food Chemistry: The 3 Sisters</td>
<td>Bring 2 foods Experimental diagram</td>
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<td>4</td>
<td>Chap 4 &amp; 5</td>
<td>The Cell</td>
<td>Reading quiz</td>
<td>Osmosis &amp; Diffusion (Diabetes)</td>
<td>Pre-lab quiz Food Lab mini Report</td>
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<td>5</td>
<td>Chap 6 Chap 7</td>
<td>Energy for Life Energy for Cells</td>
<td>Exam I</td>
<td>Cellular Respiration</td>
<td>Pre-quiz</td>
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<td>6</td>
<td>Chap 8 Chap 9</td>
<td>Cellular Reproduction Sexual Reproduction</td>
<td>Concept quiz</td>
<td>Native Identity Mitosis/Meiosis</td>
<td>Reflection paper on Native Identity</td>
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<td>7</td>
<td>Chap 11 Chap 12</td>
<td>DNA Bio &amp; Tech Gene Reg &amp; Cancer “We are all related”</td>
<td>Reading quiz</td>
<td>Scientific Writing/The science report</td>
<td>Writing workshop Graphing intro</td>
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<td>8</td>
<td>Chap 14, 15 &amp; 16</td>
<td>Evolution- micro &amp; macro</td>
<td>Concept quiz</td>
<td>Lab Practicum Investigating Monera (bacteria)</td>
<td>Inoculating bacterial plates with your sample</td>
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<td>9</td>
<td>Chap 17 &amp; 18</td>
<td>Diversity of Life</td>
<td>Reading quiz</td>
<td>Investigating Fungi, Algae, and Lichens</td>
<td>Microscope quiz</td>
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<td>10</td>
<td>Chap 19</td>
<td>Water &amp; land animals</td>
<td>Exam II</td>
<td>Gram staining (bacteria)</td>
<td>Lab Report</td>
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<td>11</td>
<td>Chap 20 Chap 21</td>
<td>Plant Anat. &amp; Growth Plant Responses &amp; Sex</td>
<td>Concept quiz</td>
<td>Investigating Plant photosynthesis</td>
<td>Discussion paper on photosynthesis due</td>
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<td>12</td>
<td>Chap 22 Chap 29</td>
<td>Animal systems Animal Reproduction</td>
<td>Reading quiz</td>
<td>Enzyme lab</td>
<td>Experimental design due</td>
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<td>13</td>
<td>Chap 25</td>
<td>Human nutrition</td>
<td>Analysis of favorite meals</td>
<td>Native foods &amp; traditional diets</td>
<td>Workshop</td>
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<td>14</td>
<td>Chap 26 &amp; 28</td>
<td>Control &amp; defense</td>
<td>Concept quiz</td>
<td>Non-toxic Cleaning supplies</td>
<td>Chemical Profile</td>
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<td>15</td>
<td>Chap 30 &amp; 31</td>
<td>Ecology, Populations Communities</td>
<td>Practice exam Oral reports</td>
<td>XXXX</td>
<td>Oral reports</td>
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<td>16</td>
<td>Finals week</td>
<td>Final</td>
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VIII. Suggested Course Evaluation:

Lecture & Lab:
Assignments, quizzes & exams will document the student’s understanding of course topics. Lab journals will be maintained by each student to monitor the student’s growth in research capabilities, and critical analysis efforts. A Plant & Medicine Cultural Research Project that requires investigation of a plant(s) usage and integrates botanical and indigenous science aspects.

Lecture:
1] Mid-term exam (15%);
2] assignments/ quizzes (40%)
3] Participation points (10%)
4] cumulative final lecture (15 %)
5] Biology/ cultural trivia questions/ answer sets (20%)

Lab:
1] Participation points (10%)
2] quality of lab journals (10%)
3] Lab assignments/ quizzes (40%)
4] exams (20%)
5] Lab Reports (20%)

IX. Bibliography:


Rutledge, Michael. (?). *Fostering Active Learning and a Diversified Instructional Environment in the Introductory Biology Course*. McGraw-Hill Instructor's Resources.


Syllabus Prepared By:

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