**2018-2019**
**Course Outcomes Guide (COG)**
**Bio113 / Bio114**

**Course Title:** Principles of Biology I Bio113
Principles of Biology II Bio14

**Date:** May 2019

**Course Team:** Rosemary Nickerson

**Expected Learning Outcomes:**

1. Students will demonstrate scientific literacy by effectively locating, evaluating, and communicating scientific information in oral, written, and/or visual formats.
2. Students will demonstrate familiarity with fundamental experimental design, laboratory technique, and data analysis.
3. Students will apply critical thinking skills to solve scientific problems.
4. Students will demonstrate a fundamental understanding of biological concepts including: the scientific method of inquiry, biological chemistry, bioenergetics, cellular and molecular biology, and genetics.

**Assessment (**How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

- 3 multiple choice / short answer exams (100 pts each)
- 1 cumulative Common Final Exam (100 pts)
- 12-18 lecture homework assignments (P/F, 10 pts each)
- 12-18 online lecture quizzes (high ten, worth 10 points each)
- 10-12 lab quizzes/assignments (20 pts each) ( 2 selected assignments attached, Appendix A)

**Validation (**What methods have you used or will you use to validate your assessment?)

Online homework assignments and quizzes are assessed automatically by educational software designed by the publisher of the course textbook. Each assessment item is linked to a specific learning objective and ranked by difficulty level 1-5.

All assignments that include essay questions are not automatically graded are assessed using a common rubric.

The Common Final Exam has been developed in house by the course instructors and has been validated by pre and post instruction exams. The scores on the Common Final exam correlate well with course grades.

**Results:**

**Bio113 2018-2019**

| | Fall 2018* *all sections (Bio113-03 & 04) | Spring 2019* *hybrid (Bio113-40) |
|---|---|---|
| # active students | 38 | 18 |
| % Withdrawals | 0 | 1 |
| % Walk-away F | 0 | 2 |
| % Success (A, B, C) (%) | 92 | 66% |
| Average Lab Grade (%) | 88.3 | 76.8 |
| Average Common Final Exam score (%) | 70.8 | 64 |
| Average Gen Ed. Assessment (%) | 78.9 | 67.5 |
| Average Course Grade (%) | 80.9 | 74 |

**Bio114 2018-2019**

| | Fall 2018* *hybrid (Bio114-21) | Spring 2019* *all sections (Bio114-01, M02, M03) |
|---|---|---|
| # active students | 16 | 46 |
| % Withdrawals | 0 | 1 |
| % Walk-away F | 1 | 0 |
| % Success (A, B, C) (%) | 87.5 | 91.3 |
| Average Lab Grade (%) | 72.6 | 85.9 |
| Average Common Final Exam score (%) | 83 | 82.3 |
| Average Gen Ed. Assessment (%) | 87.0 | 83.6 |
| Average Course Grade (%) | 77.8 | 86.8 |

**Grade Distributions**

| **Grade (%)** | **Bio113 FA18** | **Bio113 SP19 (hybrid)** | **Bio114 FA18 (hybrid)** | **Bio114 SP19** |
|---|---|---|---|---|
| **A** | 21 | 17.7 | 25 | 45.6 |
| **B** | 39.5 | 29.4 | 31.3 | 43.4 |
| **C** | 26.3 | 23.5 | 31.3 | 2.2 |
| **D** | 7.8 | 17.6 | 6.3 | 6.5 |
| **F** | 5.2 | 17.6 | 6.3 | 2.2 |

The Grade distribution for both semesters of Bio113 shows that most students receive a final course grade of C or better. This is expected in a foundation course designed for and taken by STEM majors. It is note worthy that the percentage of students who are not successful (with a grade of D or less) is higher in hybrid course sections.

The grade distribution for both semesters of Bio114 shows that most students receive a final course grade of C or better. Students who have taken two semesters of face-to-face class instruction are more successful than students enrolled in one or more hybrid sections during the course sequence.

**Item Analysis of Common Final Exam Scores**

Item Analysis of the Bio113 Common Final Exam shows several questions were answered incorrectly by a majority of students (> 65%). These are items: 12, 42, 60, 89.

Item Analysis of the Bio114 Common Final Exam shows only one question that was answered incorrectly by a majority of students (> 65%). This item will be replaced on next year's final exam.

**Follow-up (**How have you used or how will you use the data to improve student learning?)

The Common Final Exam item analysis will be compared among Bio113 instructors with the goal to identify similar deficiencies across individual sections. This analysis will lead to improved instruction in those areas, or to replace/reword specific 'problem' questions.

**Budget Justification** (What resources are necessary to improve student learning?)

Successful delivery of the course content relies on the continued supply of lab reagents and lab equipment required to perform laboratory investigations. The purchase and preparation of these materials depends on the Science Laboratory Coordinator.

Students rely heavily on Student Learning Center and Testing Center services for:
- access to course materials, physical and online
- printing of course handouts and notes
- private tutoring
- group study
- learning assessment