# JEFFERSON COLLEGE

## COURSE SYLLABUS

**BIO101**

**GENERAL BIOLOGY**

5 Credit Hours

Prepared by: Dora Mitchell

Revised by: Patricia McDaniel
August 2013

Minor Revision or Update by: Fran Moore
Per Curriculum Committee Process Change: April 25, 2018

Ms. Linda Abernathy, Division Chair, Math, Science & Business
Ms. Shirley Davenport, Dean, Arts & Science Education

**BIO101 General Biology**

I. CATALOGUE DESCRIPTION

A. Course pre-requisites/co-requisites: Reading proficiency

B. 5 semester credit hours

C. General Biology emphasizes the physical, chemical and functional aspects common to all organisms, and presents a general survey of life forms. Laboratory time is required. General Biology will fulfill the laboratory science requirement for the Associate of Arts degree (F, S, Su)

D. Curricular alignment:

- Fulfills part of Natural Sciences (Biological Sciences) with lab CORE requirements for AA, AAT, AFA, and select AAS degrees; MOTR BIOL 100L Essentials in Biology with Lab equivalent.
- Elective course applies toward AA or AAT degree.

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

| Expected Learning Outcomes | Assessment Measures |
|---|---|
| Comprehend the basics of scientific methodology, and analyze and evaluate the validity of science-based literature | Examination<br>Laboratory exercises |
| Identify and comprehend universal chemical and cellular processes utilized by life forms | Examination<br>Laboratory exercises |
| Identify and comprehend basic components of evolutionary and ecological processes | Examination |
| Comprehend basic biological terminology | Examination |
| Utilize basic biological equipment and materials | Laboratory exercises |
| Analyze and interpret data from biological studies, and present results in graphic form | Laboratory exercises |

III. OUTLINE OF TOPICS

A. Science overview
1. Scientific process and hypothesis formation
2. Experimental design and statistical testing
3. Types of scientific studies
4. Scientific literature

B. Chemical basis for life
   1. Characteristics of life
   2. Basic chemical components including atoms, molecules, and compounds
   3. Atomic structure and function
   4. Chemical bonding
   5. Water chemistry, including pH
   6. Energy and matter
   7. Organic chemistry
   8. Structure and function of macromolecules

C. Cell biology
   1. Cell theory
   2. Structure and function of cells
   3. Prokaryotes and eukaryotes
   4. Membrane transport mechanisms
   5. Enzymes and metabolism
   6. Cellular respiration and digestion
   7. Nutrients

D. Genetics
   1. DNA replication, genes, and chromosomes
   2. Cell cycle, mutations, and cellular reproduction
   3. Trait inheritance, including qualitative and quantitative genetics
   4. Mendelian genetics, including sex determination and sex linkage
   5. Protein synthesis and gene expression
   6. Genetic modification

E. Evolution
   1. Theory of evolution
   2. Evidence supporting evolution theory
   3. Evolutionary history of life forms
   4. Natural selection and mechanisms resulting in evolutionary modification
   5. Speciation and species concepts
   6. Biological classification, and life form diversity

F. Ecology
   1. Population concepts and dynamics
   2. Community and ecosystem ecology
   3. Climate and biomes
   4. Extinction causes and consequences
   5. Natural resource protection

G. Animal structure and function
   1. Basics of tissues, organs, and organ systems
   2. Internal environmental regulation
   3. Organ systems, including nervous, endocrine, respiratory, cardiovascular, muscular, skeletal, and reproductive
   4. Human reproduction

H. Plant biology
   1. Plant structure
   2. Plant reproduction
   3. Plant physiology, including adaptations
   4. Photosynthesis

IV. METHODS OF INSTRUCTION

A. Lectures

B. PowerPoint presentations

C. Videos and video clips

D. Class discussion

E. Laboratory exercises

V. REQUIRED TEXTBOOKS

A. Belk, C. M., & Maier, V. B. *Biology: science for life, with physiology* (current edition). Boston: Pearson.

B. *Biology 101 lab manual*. Jefferson College, Hillsboro, MO

VI. REQUIRED MATERIALS

No materials required

VII. SUPPLEMENTAL REFERENCES

No supplemental references required

VIII. METHODS OF EVALUATION

A. Examinations

B. Laboratory exercises

C. Grading Scale
   90-100% = A
   80-89% = B
   70-79% = C
   60-69% = D
   Below 60% = F

## IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-481-3169).

## X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, http://www.jeffco.edu).

## XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

## XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.

# General Education Curriculum and Assessment Alignment Map

## BIO101 General Biology  MOTR BIOL100L Essentails in Biology with Lab

| JEFFERSON COLLEGE ACADEMIC SKILL COMPETENCY TABLE | | | | |
|---|---|---|---|---|
| Embedded across the General Education program curriculum as well as in more advanced coursework, students learn the following academic skills, characteristics, and practices that reflect the competencies of educated persons needed for continuous learning in complex, diverse, and changing environments; full civic engagement; and fulfillment of personal life goals. Such competencies help students continue to learn and acquire new skills to deal with constantly evolving environments. These competencies are developed and applied over the full General Education program curriculum, not in any single course. | | | | |
| **Institutional Goal (adopted by Assessment Committee Oct 21, 2018)** linked to MOTR CORE 42 Academic Skill Basic Competencies https://dhe.mo.gov/core42.php The framework for Missouri's CORE 42 is designed for students to obtain the basic competencies of Valuing, Managing Information, Communicating, and Higher-Order Thinking through the completion of at least 42-semester hours distributed across the broad Knowledge Areas of Communications, Humanities & Fine Arts, Natural & Mathematical Sciences, and Social & Behavioral Sciences. The basic competencies are achieved through completion of the CORE 42 in its entirety. | **Jefferson College General Education Academic Skill Competencies (adopted by Curriculum Committee January 13, 2016)** | **Course Expected Learning Outcomes and Corresponding Assessment Measures aligned to General Education Academic Skill Competencies**<br>• these are the existing Course Expected Learning Outcomes and Corresponding Assessment Measures from the Official Course Syllabus<br>• not all Course Expected Learning Outcomes and Corresponding Assessment Measures are expected to align to General Education Academic Skills<br>• no single course is expected to align to every General Education Academic Skill Competency but each course is expected to align to a minimum of three as indicated in the Final Mapping alignment document approved at Dec 13 Assessment Committee https://drive.google.com/open?id=1bDT9xvM3h7D7-ZSKzpI8K5L8PGfvbg1i | | **Jefferson College General Education Program Assessment** |
| | | **Course Expected Learning Outcome** | **Course Assessment** | |
| Higher Order Thinking<br>Higher Order Thinking is the ability to distinguish among opinions, facts, and inferences; to identify underlying or implicit assumptions; to make informed judgments; to solve problems by applying evaluative standards; and demonstrate the ability to reflect upon and refine those problem-solving skills. This involves creative thinking, critical thinking, and quantitative literacy. | Critical Thinking<br>- Apply logic, scientific methodology, and quantitative reasoning to develop, express, and defend solutions and conclusions across the curriculum | **Comprehend the basics of scientific methodology, and analyze and evaluate the validity of science-based literature.** | **Assessment Measure (Official Course Syllabus Section II): Laboratory exercises**<br><br>**Method of Evaluation (Official Course Syllabus Section VIII): Laboratory exercises** | General Education Academic Skill Competency Development (ASCD) assessment project (evaluation of student artifacts using the following rubric(s) and student opinion survey)<br>• **Inquiry and Analysis (https://drive.google.com/open?id=0B5vQj2-5JyzWYkFiNGY2UU1hYkE)** |
| Managing Information<br>Managing Information is the ability to locate, organize, store, retrieve, evaluate, synthesize, and annotate information from print, electronic, and other sources in preparation for solving problems and making informed decisions. Through the effective management of information, students should be able to design, evaluate, and implement a strategy to answer an open-ended question or achieve a desired goal. | Information Literacy<br>- Identify, access, and critically evaluate relevant information sources for use in creating new knowledge, solving problems, and participating ethically in communities of learning. | **Comprehend the basics of scientific methodology, and analyze and evaluate the validity of science-based literature** | **Assessment Measure (Official Course Syllabus Section II): Laboratory exercises**<br><br>**Method of Evaluation (Official Course Syllabus Section VIII): Laboratory exercises** | General Education Academic Skill Competency Development (ASCD) assessment project (evaluation of student artifacts using the following rubric(s) and student opinion survey)<br>• **Information Literacy VALUE Rubric from AAC&U** |

## General Education Curriculum and Assessment Alignment Map

**BIO101 General Biology** **MOTR BIOL100L Essentails in Biology with Lab**

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|---|---|---|---|---|
| | | | | **(https://drive.google.com/open?id=0B5vQj2-5JyzWYk9OY3JZQ0Rubmc)** |
| NOT aligned to an Institutional or MDHE goal | Technology Literacy<br>- Select and utilize appropriate technology to achieve academic and professional objectives. | **Identify and comprehend universal chemical and cellular processes utilized by life forms** | **Assessment Measure (Official Course Syllabus Section II): Laboratory exercises**<br><br>**Method of Evaluation (Official Course Syllabus Section VIII): Laboratory exercises** | General Education Academic Skill Competency Development (ASCD) assessment project (evaluation of student artifacts using the following rubric(s) and student opinion survey)<br><br>● Yet to be created rubric |

Faculty responsible for alignment: **Marialana Speidel**

Date of GEPC review: Spring 2019