Course Syllabus

Course Information

Course Title: Principles of Biology

Subject and Number: BSC 2010

Course Description: In this course students will apply the scientific method to critically examine and explain the natural world. This course will cover molecular biology, cellular biology, genetics, metabolism, and replication. Student learning outcomes: students will demonstrate scientific literacy by articulating and practicing the scientific method; students will evaluate data regarding validity; students will read and interpret a variety of scientific data; students will identify major macromolecules and state their importance to living organisms; students will explain metabolism; students will compare and contrast prokaryotic and eukaryotic structures and processes of cell division and replication; and students will explain gene expression; students will solve problems in transmission genetics. Pre/Corequisite: BSC 2010L, CHM 1045. Special Fee.

Class Number: LOREM IPSUM

Term and Year: LOREM IPSUM

Course Modality: MDC Modalities

Instructor Information

Name: LOREM IPSUM

Department and Campus: LOREM IPSUM

Office location: LOREM IPSUM

Office hours: *(communicate course office hours with students)*

Phone number: 123-456-7890

Email: LOREM IPSUM

Communication Policy: *(Faculty will establish protocols for communication with students)*

Required Textbook, Course Materials, and Technology

Required course materials: *(Textbook(s), library reserves, shark pack, and/or other required readings. Include ISBN Number and author(s))*

List optional/supplemental materials/OER: LOREM IPSUM

Technology & Technical Skill Requirements: *(Technology tools or equipment students need to complete this course are included)*

Grading Policy & Assessment Methods

List all activities, papers, quizzes, tests, etc. including grading scale used for final grade calculation. Relationships between the final grade and the learner's accumulated points or percentages/weights breakdown for each assessment or component of the course grade.

Include policy on late submissions.

For MDC Live and MDC Online courses, include policy regarding exams (e.g., ProctorU, Respondus Lockdown and Monitor, etc.)

If applicable, include guidelines for extra credit.

Incomplete Grades: View the college's procedures for Incomplete Grades

Miami Dade College Policies

Attendance Policy: *(Faculty include precise statements about illnesses/emergencies/ tardiness, missed assignments/make-up.)*

Students Rights and Responsibilities: *Policies addressing academic integrity and plagiarism, code of conduct, grade appeals, religious observations, services for students with special needs, student complaints, and other.*

For more information, visit the Student's Rights and Responsibilities page

Available Support Services & Resources

- Tutoring Labs and Technology – Learning Resources
- Virtual Tutoring through Learning Resources or Smarthinking Online Tutoring
- ACCESS: A Comprehensive Center for Exceptional Student Services
- Advisement
- Password and Login Technical Support
- Technical Support for MDC Live and MDC Online Courses
- SMART Plan

(Faculty select from the above if applicable and include additional course/campus specific resources)

Available Support Services & Resources

- Public Safety - Services
- Hurricane and Other Natural Disasters: In the event of a hurricane or other disaster, the class follows the schedule established by the College for campus-based courses. Please visit the MDC website or call the MDC Hotline (305-237-7500) for situation updates.

Course Description

BSC2010 | Principles of Biology | 3 credits

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Course Competencies

Competency 1:

The student will upon completion of this course, understand the process of science and the nature of biology by:

- Explaining the components of the scientific process as basis for all scientific inquiry.
- Understanding the hierarchical nature of life and its emergent properties.
- Discussing the characteristics of life and how living things interact with one another and with their environment.
- Describing how dynamic balances maintained in living systems through regulatory mechanisms.

Learning Outcomes

- Critical thinking
- Environmental Responsibility

Competency 2:

The student will upon successful completion of this course, understand the basic chemistry of life by:

- Identifying the components of matter and understanding basic atomic structure.
- Differentiating the basic types of chemical bonds that form molecules and compounds.
- Describing intermolecular interactions and how bonds are made and broken in chemical reactions.
- Describing the properties of water and how they play a role in the evolution and continuity of life on Earth.
- Identifying the functional groups of organic molecules and the relationship between monomers and polymers.
- Comparing the structure and function of carbohydrates, lipids, proteins, and nucleic acids in living systems.

Learning Outcomes

- Critical thinking

Competency 3:

The student will upon successful completion of this course, be able to understand cell structure and function by:

- Differentiating the basic cell types and their evolutionary relationships.
- Explaining the structure and functions of subcellular organelles.
- Understanding the structure and function of biological membranes.
- Explaining cellular inter- and intracellular communication pathways.
- Explaining cellular reproduction, the cell cycle and how it is regulated at the molecular level.
- Contrasting asexual and sexual reproduction.

Learning Outcomes

- Critical thinking

Competency 4:

The student will upon successful completion of this course, understand energy transformations within a cell by:

- Understanding how the laws of thermodynamics apply to energy transformations within cells.
- Explaining the structure, function and regulation of enzymes in cellular metabolism.
- Describing the structure and function of ATP and its role in exergonic and endergonic reactions.
- Analyzing the stages of cellular respiration, anaerobic processes, and photosynthesis and their evolutionary significance in the continuation of life on Earth.

Learning Outcomes

- Critical thinking

Competency 5:

The student will upon successful completion of this course, be able to explain how DNA directs cellular structure and function by:

- Explaining DNA structure, replication and the nature of the genetic code. Describing the nature and consequences of point and chromosomal mutations.
- Understanding transcription and translation as means for gene expression.
- Contrasting regulation of gene expression in prokaryotes and eukaryotes and their evolutionary significance.
- Describing the principles and techniques of gene manipulation and molecular genetics.

Learning Outcomes

- Critical thinking

Competency 6:

The student will upon successful completion of this course, be able to understand the principles of classical and modern genetic analyses by:

- Understanding the nature of heredity and the structure and behavior of chromosomes.
- Explaining and contrasting the principles of Mendelian and non-Mendelian genetics.
- Understanding the genetic basis of diseases.
- Describing techniques utilized in genetic testing and molecular biology.

Learning Outcomes

- Critical thinking