

## Request for Courses in the Core Curriculum

Originating Department or College: Department of Biology and Chemistry, College of Arts and Sciences

Person Making Request: Fernando Quintana

Telephone: (956) 326-2589

E-mail: fquintana@tamiu.edu

Course Number and Title: BIOL 2102 – Anatomy and Physiology 2 - Lab

Please attach in separate documents:

Completed Catalog Add/Change Form

Syllabus

List the student learning outcomes for the course (Statements of what students will know and/or be able to do as a result of taking this course. See appended hints for constructing these statements.)

**Student Learning Outcomes:** After completing of the course the students will be able to:

1. Apply critical thinking to examine primary literature concerning molecular biology in order to effectively defend a conclusion.
2. Use the scientific method to design an experiment and analyze a data set to determine a conclusion.
3. Demonstrate effective technical communication skills.
4. Collaborate effectively on a research project and on a presentation of scientific results.

### I. Endocrine System

1. Distinguish between the nervous system and the endocrine system
2. Distinguish between paracrine and endocrine cellular communication
3. Classify hormones according with their chemical properties.
4. Describe the patterns of hormonal interaction.
5. Describe the mechanisms of hormonal action
6. Describe the anatomy and functions of the hypothalamus and pituitary gland
7. Describe the anatomy and function of the thyroid and parathyroid glands
8. Describe the anatomy and function of the adrenal gland
9. List the hormones of the intestines, kidneys, heart, thymus, gonads, and adipose tissue, and describe their function.

### II. Cardiovascular System

1. Discuss the characteristics of blood, including plasma, red blood cells, white blood cells and platelets
2. Discuss the heart and its function, including its anatomy, heartbeat cycle, and blood pressure
3. Discuss the anatomy and function of the blood vessels, including cardiovascular physiology and regulation, the pulmonary circuit, the systemic circuit, and fetal circulation.

### III. Respiratory System

1. Describe the anatomy and function of the respiratory system
  - a. Describe the anatomy and function of the upper respiratory system
  - b. Describe the anatomy and function of the larynx
  - c. Describe the anatomy and function of the trachea and primary bronchi
  - d. Describe the anatomy and function of the lungs
  - e. Discuss the process of ventilation
  - f. Discuss the process of gas exchange

- IV. Digestive System
  - 1. Describe the anatomy of the digestive system
  - 2. Describe the function of the digestive system
    - a. Discuss the process of digestion of carbohydrates, lipids, and proteins
    - b. Discuss the process of absorption of carbohydrate nutrients, lipid nutrients and protein nutrients.
  
- V. Metabolism
  - 1. Discuss the processes of glycolysis and mitochondrial ATP production
  - 2. Discuss the processes of lipid metabolism
  - 3. Discuss the processes of protein metabolism
  - 4. Discuss thermoregulation
  
- VI. Urinary System
  - 1. Describe the anatomy of the urinary system
  - 2. Discuss the function of the kidneys
  
- VII. Electrolyte and acid-base balance
  - 1. Describe the fluid and electrolyte balance
  - 2. Describe the acid-base balance
  
- VIII. Reproductive System and Development
  - 1. Describe the anatomy of the male reproductive system.
  - 2. Discuss the physiology of the male reproductive system
  - 3. Describe the anatomy of the female reproductive system
  - 4. Discuss the physiology of the female reproductive system
  - 5. Discuss and describe the process of fertilization
  - 6. Discuss and describe the process of development
  
- IX. Heredity
  - 1. Discuss the principles of heredity
  - 2. Discuss Genes and gene expression

**Core-Curriculum Learning Outcomes:**

- 1. Critical Thinking: includes creative thinking, innovation, inquiry and analysis, evaluation, and synthesis of information. (SLOs: 1 & 2)
- 2. Communication Skills: Students will demonstrate their ability to communicate effectively by using written communication. (SLOs: 3 & 4)
- 3. Empirical and Quantitative Skills: includes the manipulation and analysis of numerical data or observable facts resulting in informed conclusions. (SLOs: 2)
- 4. Teamwork: includes the ability to work effectively with others to support a shared goal. (SLOs: 4)

Component Area for which the course is being proposed (check one):

- |  |   |
|--|---|
| <input type="checkbox"/> Communication                       | <input type="checkbox"/> American History             |
| <input type="checkbox"/> Mathematics                         | <input type="checkbox"/> Government/Political Science |
| <input type="checkbox"/> Language, Philosophy, & Culture     | <input type="checkbox"/> Social & Behavioral Science  |
| <input type="checkbox"/> Creative Arts                       | <input type="checkbox"/> Component Area Option        |
| <input checked="" type="checkbox"/> Life & Physical Sciences |   |

Competency areas addressed by the course (refer to the appended chart for competencies that are required and optional in each component area):

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Critical Thinking               | <input type="checkbox"/> Teamwork                |
| <input type="checkbox"/> Communication Skills                       | <input type="checkbox"/> Personal Responsibility |
| <input checked="" type="checkbox"/> Written Communication           | <input type="checkbox"/> Social Responsibility   |
| <input type="checkbox"/> Oral Communication                         |  |
| <input type="checkbox"/> Visual Communication                       |  |
| <input checked="" type="checkbox"/> Empirical & Quantitative Skills |  |

Because we will be assessing student learning outcomes across multiple core courses, assessment assigned in your course must include assessment of the core competencies. For each competency checked above, indicate the specific course assignment(s) which, when completed by students, will provide evidence of the competency. Provide detailed information, such as copies of the paper or project assignment, copies of individual test items, etc. A single assignment may be used to provide data for multiple competencies.

Critical Thinking:

During the "Digestive Enzyme" lab, students will perform an experiment on the effect of pH and temperature on digestive enzyme activity on carbohydrates, lipids and proteins. They will use critical thinking to compile and analyze the data, determine the function of controls and variables in the experiment and predict the effects of different variables on the digestion rate of a suite of food types. A critical thinking rubric with domains for creative thinking, depth of inquiry, evaluation of importance and synthesis of information can be scored by the instructor from the lab report, or the written lab report can be up loaded for evaluation by the Core Curriculum Assessment Committee.

Communication Skills:

Upon completion of the "Digestive Enzyme" lab, each student will write a 3-4 page lab report addressing critical thinking questions concerning the function of enzymes and how their results impact human nutrition. The instructor can score the written lab report for organization, focus, style and grammar using a modified WIN rubric, or the report can be up loaded for evaluation by the Core Curriculum Assessment Committee.

Empirical & Quantitative Skills:

During the "Digestive Enzyme" lab, students will calculate the rates of enzyme activity under different conditions, graph their results and determine the mathematical relationship between the variables. The instructor can assess the logical reasoning behind the calculations and extrapolations, or the written lab report can be up loaded for evaluation by the Core Curriculum Assessment Committee.

Teamwork: N/A

Personal Responsibility: N/A

Social Responsibility: N/A

Will the syllabus vary across multiple sections of the course?     Yes                                     No

If yes, list the assignments that will be constant across the sections:

In each section, the first 4 student learning outcomes and the assignments described for assessment will be consistent across sections.

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every five (5) years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their courses.

Reviewed and approved by the Core Curriculum Committee on February 15, 2013.