Spring 2016
Biology 301.001
Biology for Teachers (Grades 4-8) Lecture

Name: Dr. Dennis A. Gravatt
Department: Biology
Email: dgravatt@sfasu.edu
Phone: (936) 468-2418
Office: S239
Office Hours:  T&R 8:00-9:00; M&W 1:30-3:00
Class meeting time and place: TR 2:00-4:20; S119

Course Description:
This course provides instruction in the main areas of biological science for which science teachers (Grades 4-8) are expected to demonstrate competency for teacher certification. Students seeking certification in Early Childhood-Grade 6 Generalist are also encouraged to enroll. Topics include basic principles of science, structure and function of living things, reproduction and heredity, adaptation and evolution, regulatory mechanisms and behavior, and organisms and environment.

Number of Credit Hours: 4 semester hours – 3 hours lecture and 2 hours lab per week.

Course Prerequisites and Corequisites:
Prerequisites: None; Corequisites: 301L

Program Learning Outcomes:
There are no specific program learning outcomes for this major addressed in this course. This course is a general education course and a service course.

General Education Core Curriculum Objectives:
There are no specific general education core curriculum objectives in this course. This course is not a core curriculum course.

Course Objectives:
To train science teachers, in grades four through eight, on the basic concepts of biological principles. To demonstrate the applications of these concepts in the classroom, especially by the use of appropriate hands-on exercises.

Student Learning Outcomes:
Upon completion of this course, the students are expected to:
- Understand that investigations require a research question, careful observations, data gathering, and analysis of the data to identify the patterns that will explain the findings.
- Understand that scientific investigations are used to learn about the natural world.
- Understand that all living organisms are made up of smaller units called cells.
- Understand that all cells use energy, get rid of wastes, and contain genetic material.
- Understand the internal structures within plant and animal cells that allow them to obtain energy, get rid of wastes, grow, and reproduce in different ways.
- Understand that cells can organize into tissues, tissues into organs, and organs into organ systems.
- Understand the organization of hereditary material (e.g., DNA, genes, chromosomes).
• Understand how inherited traits can be determined by one or many genes and how more than one trait can be influenced by a single gene.
• Understand that the major functions of human body systems
• Understand the relationship between living organisms and their environment.
• Understand that different environments support different living organisms that are adapted to that region of Earth.
• Understand that successful organisms can reestablish a balance through different processes such as a feedback mechanism.
• Understand that during both sexual and asexual reproduction, traits are passed onto the next generation.
• Understand that changes in traits sometimes occur in a population over many generations.
• Understand the interactions between organisms in ecosystems
• Understand how biotic and abiotic factors affect the number of organisms and populations present in an ecosystem
• Understand that ecological succession can be seen on a broad or small scale.

The Texas Examinations of Educator Standards (TExES) are criterion-referenced examinations designed to measure your knowledge in relation to an established criterion rather than to the performance of other candidates. The TExES (116) Science 4-8 exam is based on the Texas Essential Knowledge and Skills (TEKS), which are the Texas state standards for what students should know and be able to do. This course focuses on Domain III: Life Science, "The science teacher knows the curriculum (TEKS) in life science" (Competencies 011-015). For specific details about these competencies see the following web page or look in your D2L content:


Text and Material:


The electronic version is free. If you would like a hard bound copy of the textbook they are available on Amazon for about $30.

Laboratory Safety Goggles. Available at Wal-Mart, Home Depot, Lowes, Tractor Supply, Atwood's and Ranch, etc.

Course Requirements:
Four (4) exams worth 100 points each. The exams will consist of multiple choice, fill-in-the-blank and short essay questions. Homework assignments will total 200 points.

Each student is expected to maintain a laboratory notebook of all hands-on-exercises, including student data sheets. Lab reports (200 points) will be turned in on time, with a 25% per day penalty for any late work. All homework, lab reports and all other written assignments must be type written. Handwritten work will not be accepted.
Concept Coach Instructions:

This course will be piloting the Concept Coach for OpenStax College.

Follow the steps below to register for Concept Coach:

1. Using your web browser to visit your Concepts of Bio (non-majors) textbook: https://cnx.org/contents/v5a_xecj@2.2:3

2. Click on section 1.1 in the book. Scroll to the bottom of the section and click on the “Launch Concept Coach” button.

3. Click "Sign up" and follow the prompts to create your free account.

4. At the end of your account set-up, you will be prompted to enter your two-word enrollment code: “other clerk”

5. Continue to your Concept Coach questions!

Grading Scheme:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (4)</td>
<td>400</td>
</tr>
<tr>
<td>Homework &amp; Assignments</td>
<td>200</td>
</tr>
<tr>
<td>Lab Reports</td>
<td>200</td>
</tr>
<tr>
<td>Concept Coach Participation</td>
<td>100</td>
</tr>
<tr>
<td>Lab Notebook/Project</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1000 points</strong></td>
</tr>
</tbody>
</table>

Grading Policy:

- A  90.00%  =  900 points
- B  80.00%  =  800 points
- C  70.00%  =  700 points
- D  60.00%  =  600 points
- F  <59.99%

Exam Dates:

- Exam #1  Feb 16  Chapters 1-4
- Exam #2  Mar 10  Chapters 5, 12, 16 & 6
- Exam #3  Apr 12  Chapters 7-10
- Exam #4  May 10  Chapters 11, 19, 20 & 21
Course Topics (percent time during course):

Unifying Concepts in Biology (15%)
   Chapter 1: Introduction to Biology

Structure and Function of Living Things (25%)
   Chapter 2: Chemistry of Life
   Chapter 3: Cell Structure and Function
   Chapter 4: How Cells Obtain Energy
   Chapter 5: Photosynthesis
   Chapter 12: Diversity of Life, Organizing Life on Earth

Regulatory Mechanisms and Behavior (5%)
   Chapter 16: The Body’s Systems

Reproduction and Heredity (20%)
   Chapter 6: Reproduction at the Cellular Level
   Chapter 7: The Cellular Basis of Inheritance
   Chapter 8: Patterns of Inheritance
   Chapter 9: Molecular Biology
   Chapter 10: Biotechnology

Adaptation and Evolution (10%)
   Chapter 11: Evolution and Its Processes

Organisms and Environment (25%)
   Chapter 19: Population and Community Ecology
   Chapter 20: Ecosystems and the Biosphere
   Chapter 21: Conservation and Biodiversity

Attendance Policy:
Regular and punctual attendance is expected. The value of a college education depends upon
the student’s full participation. Because students are expected not merely to receive information
passively or to pass examinations but to participate actively in class, it is important that
unnecessary class absences be avoided. Students are expected to be present for all classes
and no absence will be automatically excused.

The missing of three (3) or more lecture/lab periods will result in the reduction of your
course grade by one full letter grade. On any given day, missing of the lecture or lab period
will count as one absence. There will be no distinction between excused and unexcused
absences in counting absences. Legitimate excuses for absences only affect whether students
may be given an opportunity to make up work. Students will be responsible for all missed work.

If you come in late you must check with me after class in order to clear any record of absence
for that day. This is your responsibility. Reoccurring tardiness should be explained. A seating
chart may be utilized in this course. In addition, an attendance sheet will be passed around on
which you will put your signature next to your name. It is your responsibility to see that the role
sheet is signed before leaving the lecture class. Do not sign in for another student, doing so will
result in a significant reduction in your course grade and the assignment of seats for all students
in the class. It is also your responsibility to keep up with the number of absences that you have
accrued.
Some appropriate reasons for absenteeism are: an illness with dated medical notes; death in the immediate family with clippings from a newspaper announcing the death; scheduled athletic events; scheduled academic events. Other reasons can be discussed, but may not be excused.

You are responsible to know what was announced and what material was covered in class during your absence. Lecture notes are not available from your instructor.

The will be no make-up of individual experiments or class exercises.

**Academic Integrity (A-9.1):**
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

**Definition of Academic Dishonesty**
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp)

Any student found cheating will be subject to the penalties as stated in the Student Code of Conduct handbook; including but not limited to a score of zero on exam, expulsion from the class or expulsion from the University.

**Withheld Grades Semester Grades Policy (A-54):**
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

**Students with Disabilities**
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be
provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Acceptable Student Behavior
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

As future teachers, I expect you to conduct yourselves as you would expect your students to behave. Please be considerate of your classmates and the instructor. Please keep cell phones on silent, on vibrate, or turned off and in your backpack, purse or pocket. If you are found to be using your cell phone (including text messaging) during class, you will be asked to leave class for that day and will be counted absent.
## TENATIVE LECTURE SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Chapter</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 19 &amp; 21</td>
<td>Introduction to Biology</td>
<td>1</td>
<td>9-30</td>
</tr>
<tr>
<td>Jan 26 &amp; 28</td>
<td>Chemistry of Life</td>
<td>2</td>
<td>31-60</td>
</tr>
<tr>
<td>Feb 2 &amp; 4</td>
<td>Cell Structure and Function</td>
<td>3</td>
<td>61-96</td>
</tr>
<tr>
<td>Feb 9 &amp; 11</td>
<td>How Cells Obtain Energy</td>
<td>4</td>
<td>97-122</td>
</tr>
<tr>
<td>Feb 16 &amp; 18</td>
<td>Photosynthesis</td>
<td>5</td>
<td>123-140</td>
</tr>
<tr>
<td><strong>Feb 16</strong></td>
<td><strong>Exam #1 – First hour of class</strong></td>
<td>1-4</td>
<td></td>
</tr>
<tr>
<td>Feb 23 &amp; 25</td>
<td>Diversity of Life, Organizing Life on Earth</td>
<td>12</td>
<td>281-295</td>
</tr>
<tr>
<td>Mar 1 &amp; 3</td>
<td>Reproduction at the Cellular Level</td>
<td>6</td>
<td>141-158</td>
</tr>
<tr>
<td>Mar 8 &amp; 10</td>
<td>The Cellular Basis of Inheritance</td>
<td>7</td>
<td>159-178</td>
</tr>
<tr>
<td><strong>Mar 10</strong></td>
<td><strong>Exam #2 – First hour of class</strong></td>
<td>5, 12, 16 &amp; 6</td>
<td></td>
</tr>
<tr>
<td>Mar 15-17</td>
<td>Spring Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar 22 &amp; 24</td>
<td>Patterns of Inheritance</td>
<td>8</td>
<td>179-203</td>
</tr>
<tr>
<td>Mar 29 &amp; 31</td>
<td>Molecular Biology</td>
<td>9</td>
<td>205-229</td>
</tr>
<tr>
<td>Apr 5 &amp; 7</td>
<td>Biotechnology</td>
<td>10</td>
<td>231-253</td>
</tr>
<tr>
<td>Apr 12 &amp; 14</td>
<td>Evolution and Its Processes</td>
<td>11</td>
<td>255-295</td>
</tr>
<tr>
<td><strong>Apr 12</strong></td>
<td><strong>Exam #3 – First hour of class</strong></td>
<td>7-10</td>
<td></td>
</tr>
<tr>
<td>Apr 19 &amp; 21</td>
<td>Population and Community Ecology</td>
<td>19</td>
<td>515-545</td>
</tr>
<tr>
<td>Apr 26 &amp; 28</td>
<td>Ecosystems and the Biosphere</td>
<td>20</td>
<td>547-585</td>
</tr>
<tr>
<td>May 3 &amp; 5</td>
<td>Conservation and Biodiversity</td>
<td>21</td>
<td>587-613</td>
</tr>
<tr>
<td><strong>May 10</strong></td>
<td><strong>Exam #4 – 1:00pm-3:00pm</strong></td>
<td>11, 19, 20 &amp; 21</td>
<td></td>
</tr>
</tbody>
</table>

1 This syllabus is an estimate of topics to be covered for each date indicated. It is the responsibility of each student to be aware of the lecture schedule, and the material to presented, as the course progresses. It is expected that the student will have read the appropriate sections of the textbook prior to each lecture.

2 Chapter 16 (The Body’s Systems) will be read on your own.

3 March 24th class will not meet, Easter Break.