Biology for Science Majors I
BIOL 1406-63004
Semester: Spring 2019
January 22, 2019 – May 16, 2019

Lecture Professor: Thomas Adam Cochran
Email: tcochran@dcccd.edu
Office Number: N/A
Office Hours: MW by appointment
Laboratory Professor: Harini Bajjuri
Email: HariniBajjuri@dcccd.edu
Meeting Days & Time: Lecture: MW 11:15AM-12:35PM; Lab: 12:45PM-2:05PM
Room Number: Lecture: H36 Lab: H119
Credit Hours: 4 Semester Hours
Division: Science, Technology, Engineering and Math - STEM
Division Office Phone: 214-860-8649 then 214-860-8761  Division Office Number: H129

Course Description:
Fundamental principles of living organisms will be studied, including physical and chemical properties of life, organization, function, evolutionary adaptation, and classification. Study and examination of the concepts of cytology, reproduction, genetics, and scientific reasoning are included. Laboratory activities will reinforce these concepts. (3 Lec. 3 Lab.)

Course Pre-requisites: College level ready in Reading and Writing.

Course Materials/Supplies Needed
• Lab Safety Kit SKU 019071998: which includes: 1 Chemical Splash Goggles, 10 pairs Nitrile Gloves for working with chemicals, and 1 clear plastic apron (available in the College Bookstore- $30.00)
• LAB MANUAL: Print labs from eCampus prior to attending each lab session.
• Chemical Splash Goggles and Nitrile Gloves for working with chemicals (available in the College Bookstore)
• Scantrons: Four 882E
• 3-Ring Binder with dividers for the labs and lab assignments printed from eCampus (2 inch binder recommended)

Core Objectives
• Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
• Communication Skills - to include effective development, interpretation and expression of ideas through written, oral and visual communication
• Empirical and Quantitative Skills - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
• Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
Student Learning Outcomes for Lecture
After successful completion of this course the student will be able to:
• Describe the characteristics of life
• Explain the methods of inquiry used by scientists
• Identify the basic requirements of life and the properties of the major molecules needed for life
• Compare and contrast the structures, reproduction, and characteristics of viruses, prokaryotic cells and eukaryotic cells.
• Describe the structure of cell membranes and the movement of molecules across a membrane.
• Identify the principles of inheritance and solve classical genetics problems.
• Identify the chemical structures, synthesis, and regulation of nucleic acids and proteins.
• Describe the unity and diversity of life and the evidence for evolution through natural selection

Student Learning Outcomes for Lab
• Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
• Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
• Communicate effectively the results of scientific investigations.
• Describe the characteristics of life.
• Explain the methods of inquiry used by scientist.
• Identify the basic properties of substances needed for life.
• Compare and contrast the structures, reproduction, and characteristics of viruses, prokaryotic cells, and eukaryotic cells.
• Describe the structure of cell membranes and the movement of molecules across a membrane.
• Identify the substrates, products, and important chemical pathways in metabolism.
• Identify the principles of inheritance and solve classical genetic problems.
• Identify the chemical structures, synthesis, and regulation of nucleic acids and proteins.
• Describe the unity and diversity of life and the evidence for evolution through natural selection

Course Outline:
Objectives, which are determined by the district curriculum committee, are measurable or observable and will be evaluated. Different modes of instruction will be utilized for presentation and evaluation. Lecture topics will include characteristics of life, homeostasis, scientific process, biological chemistry, cells, plasma membranes, osmosis, metabolism, enzymes, cellular respiration, photosynthesis, mitosis, meiosis, genetics, DNA, replication, transcription, and translation. Class objectives will be identified at the beginning of each class session and posted on eCampus. The course calendar at the end of the syllabus shows the topics for each class and test deadlines
Evaluation Procedures:

**LECTURE EXAMS:** 65% of the total grade.
- Five (5) required lecture exams cover the assigned chapters from the book and are listed on the course calendar. The sixth exam is a comprehensive final exam given during exam week in the lecture classroom. Lowest grade will be dropped only if all exams are taken.
- In the event of a missed exam, the instructor *must be notified within 24 hours* of the scheduled exam and documentation will be required for the absence.

**BIOLOGICAL PROCESS PAPERS:** 5% of the total grade
- Students must write a complete description of assigned biological processes in class using their own words. The requirements and due dates will be announced in class and posted on eCampus under Weekly Assignments. No makeups on this in class assignment.

**LAB REPORT:** 10% of the total grade – Lab 10 Diffusion

**LABORATORY PRACTICALS:** 15% of the total grade
- Laboratory Practicals **MUST** be taken during the scheduled lab exam time (see course calendar). You will need a Scantron 882E for each practical.
- There is a time limit of 1 hour - 15 minutes for all lab exams.
- A laboratory practical tests your knowledge of laboratory information, ability to interpret data, and ability to successfully perform laboratory skills.

**LABORATORY NOTEBOOK:** - 5% of total grade
You must turn in your lab notebook when you take each lab practical. Requirements for the lab notebook will be posted on eCampus.

*You will not be eligible for bonuses on tests or curves if you are late to class, late turning in assignments, missing assignments, do not participate, not prepared or have too many absences.*

**GRADING SCALE:**

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<thead>
<tr>
<th>FOR EACH EXAM:</th>
<th>FOR FINAL GRADE:</th>
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<tr>
<td>A = 90 -100</td>
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<td>B = 80 - 89</td>
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**Instructor Attendance Policy:**
- Students are expected to attend all classes. Students have the responsibility to attend class and to consult with the instructor when an absence occurs. If for some reason you must leave class early, you should inform the instructor prior to the start of class of your reason for leaving early. **On-time attendance is vital to your success in this course. Plan to arrive early. On-time attendance is taken at the beginning of class. A deduction may occur for lack of participation if unexcused tardy or absence.**

**Student Expectations:**
- Students will develop personal responsibility in the areas of on-time attendance, completing all assignments on time, studying 12-15 hours per week outside of class, and bringing the textbook to class.
- Students will develop personal responsibility in the areas of proper care for scientific equipment, proper care and respect for biological specimens, safety in the laboratory, proper storage of laboratory equipment, and cleanliness of laboratory stations.
- Students must write their name, course and section and instructor name on all assignments
- No earbuds in class. Please turn your cell to vibrate and step outside if you must text. No texting in class.

**Late Work Policy:**
• Students must contact the instructor if they will miss class, lab, or the due date for an assignment within 24 hours.
• Documentation of an excused absence is required. Arrangements must be made with the instructor to make-up a lab, exam, or assignment.
• Work is due at the beginning of class on the due date.
• Twenty points may be deducted per day for an assignment that is late if accepted. In class work that has a late start due to tardiness will have a minimum of 10 points deducted if accepted.

Makeup Exam Policy:
• Students must contact the instructor if they will miss an exam within 24 hours of the due date.
• Documentation of an excused absence is required.
• Arrangements must be made with the instructor to make-up an exam.

LABORATORY EXPECTATIONS:
ATTENDANCE IS MANDATORY and each exercise will require laboratory participation. Attendance will be taken at the beginning of each class period.
• Students are required to print a copy of the lab for each day from eCampus prior to class. The labs are formatted for the Arial font. If you do not have access to a computer and printer, you can print the pages for a small fee in the campus computer labs, W139 (W141 and W142).
• Instructions are given at the beginning of each lab and WILL NOT be repeated. Students who miss instruction will not be allowed to participate in lab.
• Labs for each lab practical must be kept in a lab notebook and brought to each lab session.
• Nitrile Gloves and chemical splash goggles are required when working with chemicals. Purchase them before class! NO GLOVES, NO GOGGLES, NO LAB!
• Hazardous Materials are used in the laboratory areas. Material Safety Data Sheets (MSDS), required by OSHA, are available for all students to observe upon request.
• Cell Phones are not permitted to ring in the lab. No texting in class or lab—please step out into hall
• Students who bring computers to class are not permitted to check email or the Internet
• Eating, Drinking, Gum Chewing, and/or Applying Cosmetic are NOT ALLOWED in the laboratory at any time. Do not bring any beverage containers or water bottles into the lab.

eCampus:
• Students are encouraged to use the resources available on eCampus regularly.
• Go to the website: http://ecampus.dcccd.edu. Your login is an “e” and your seven-digit student identification number (example: e7654321). If you have never used eCampus before, your password is the same as your user name until you change it under personal information.

eConnect: Your final grade will be posted to eConnect and the course will be made unavailable.

Disclaimer:
Instructor reserves the right to change course calendar and syllabus if needed.

Withdraw date: Thursday, April 17, 2019
• Please speak with the instructor if you are having difficulty in the course.
• Students often drop courses when help is available that would enable them to continue. I hope you will discuss your plans with your instructor if you feel the need to withdraw.

Academic Dishonesty:
Students caught plagiarizing an assignment will receive a “0” on the test or assignment and will be subject to an “F” in the course and possible expulsion from the college. Any testing or exam requires no phone or notes may be used in Testing Center, Classroom or Lab Practical and may result in a “0” on the assignment and possible “F” and or expulsion.

Mountain View College Institutional Policies:
<table>
<thead>
<tr>
<th>Monday – 1406-63002</th>
<th>Wednesday</th>
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<tr>
<td><strong>1/21 Week 1</strong>&lt;br&gt;Holiday</td>
<td><strong>1/23</strong>&lt;br&gt;LEC: Introduction, Study Skills and Chap 1 <em>Study of Life</em>&lt;br&gt;LAB 1: Safety/MSDS Video</td>
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<td><strong>1/28 Week 2</strong>&lt;br&gt;LEC: Chapter 1 <em>Study of Life</em> Cont&lt;br&gt;LAB 2: Measurement</td>
<td><strong>1/30</strong>&lt;br&gt;LEC: Chap 2 <em>The Chemical Foundation of Life – Water</em>&lt;br&gt;LAB 3: Scientific Method and Homeostasis</td>
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<td><strong>2/4 Week 3</strong>&lt;br&gt;LEC: Chapter 2 <em>The Chemical Foundation of Life – Chemistry</em>&lt;br&gt;LAB 4: Solutions and Dilutions</td>
<td><strong>2/6</strong>&lt;br&gt;Lec: Ch 2 Chapter 2 <em>The Chemical Foundation of Life – Chemistry &amp; Carbon</em>&lt;br&gt;LAB 5: pH and Buffer</td>
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<td><strong>2/11 Week 4</strong>&lt;br&gt;LEC: Ch 3 <em>Biological Macromolecules</em>&lt;br&gt;LAB 6: Testing Organic Molecules</td>
<td><strong>2/13</strong>&lt;br&gt;LEC : Chapter 3 <em>Biological Macromolecules</em>&lt;br&gt;LAB 7 : Microscope&lt;br&gt;Lecture Exam 1 (Chap 1-3) - in testing center Deadline 2/15</td>
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<td><strong>2/18 Week 5</strong>&lt;br&gt;LEC : Chapter 4 <em>Cell Structure, Prokaryotic and Eukaryotic Cells</em>&lt;br&gt;LAB 8: Cells – Prokaryotic Cells and Plant Cells</td>
<td><strong>2/20</strong>&lt;br&gt;LEC:Chapter 5 <em>Structure and Function of Plasma Membranes</em>&lt;br&gt;LAB 9 : Cells – Animal Cells and Diffusion</td>
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<td><strong>2/25 Week 6</strong>&lt;br&gt;LEC : Chapter 5 <em>Structure and Function of Plasma Membranes</em>&lt;br&gt;LAB 9 : Cells – Animal Cells and Diffusion&lt;br&gt;LAB 10: Osmosis</td>
<td><strong>2/27</strong>&lt;br&gt;Lab Report over Lab 10 Diffusion – each person (be very thorough)&lt;br&gt;Process Paper 1 – Diffusion and Osmosis&lt;br&gt;LEC: Chapter 6 <em>Introduction to Metabolism</em>&lt;br&gt;LAB : LAB PRACTICAL 1 (Labs 1-10) – Lab Notebook Due</td>
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<td><strong>3/4/19 Week 7</strong>&lt;br&gt;LEC : Chapter 6 <em>Introduction to Metabolism</em>&lt;br&gt;LAB 11 : Enzymes – Catalase and Lipase</td>
<td><strong>3/6</strong>&lt;br&gt;LEC : Chapter 7 <em>Cellular Respiration - Aerobic</em>&lt;br&gt;LAB 12 Aerobic Cellular Respiration&lt;br&gt;Lecture Exam 2 (Chap 4-6) in testing center Deadline 3/8</td>
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<td><strong>SPRING BREAK 3/11 – 3/15</strong></td>
<td><strong>3/20</strong>&lt;br&gt;LEC : Chapter 8 Photosynthesis - Light Dependent&lt;br&gt;LAB 14 : Photosynthesis – Absorbance Spectrum</td>
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<td><strong>3/18 Week 8</strong>&lt;br&gt;LEC 13 : Anaerobic Cellular Respiration</td>
<td><strong>3/25</strong>&lt;br&gt;LEC : Chapter 8 Photosynthesis – Light Dependent and Calvin&lt;br&gt;LAB 15: Photosynthesis – Chromatography, O₂ Production, Chloroplast&lt;br&gt;Process Paper 2 – Photosynthesis in class&lt;br&gt;LEC : Chapter 8 <em>Photosynthesis and Review</em>&lt;br&gt;LAB: LAB PRACTICAL 2 (Labs 11-15, measurement and solutions)&lt;br&gt;Lab Notebook Due&lt;br&gt;Lecture Exam 3 (Chap 7-8) in testing center Deadline 3/27</td>
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<td><strong>4/1 Week 10</strong>&lt;br&gt;LEC: Chapter 10 <em>Cell Reproduction (Mitosis and Cancer)</em>&lt;br&gt;LAB 16: Mitosis</td>
<td><strong>4/3</strong>&lt;br&gt;LEC: Chapter 11 <em>Meiosis and Sexual Reproduction</em>&lt;br&gt;LAB 17: Meiosis</td>
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| 4/22  | Week 13    | LEC: Chapter 14 DNA Structure and Function Cont  
WATCH BIOTECHNOLOGY: [https://www.youtube.com/watch?v=f8PyAQ9bAPk](https://www.youtube.com/watch?v=f8PyAQ9bAPk)  
LAB 22: DNA Technology –DNA Isolation  
Lab Quiz over PCR Online Lab - Lab |
| 4/24  |            | Process Paper 4 – DNA Replication in class  
LEC: Chapter 14 DNA Replication Cont  
LAB 23: DNA Replication & Puzzles |
| 4/30  | Week 14    | LEC: Chapter 15 Gene and Proteins  
LAB 24: Replication, Transcription and Translation |
| 5/1   |            | LEC: Chapter 21.2 Virus Reproduction – Review  
Review VIRUS: [https://www.youtube.com/watch?v=UEKS4w9bf1g](https://www.youtube.com/watch?v=UEKS4w9bf1g)  
Lab 25: Lab Review for Lab Practical 3 |
| 5/6   | Week 15    | LEC: Review Lectures  
LAB: LAB PRACTICAL 3 (LABS 16-25 measurement, metric conversions, microscope) Lab Notebook Due |
| 5/8   |            | LECTURE EXAM 5 (Ch 14, 17, 15 and 21.2) testing center – Deadline 5/10 |
| 5/13  | Week 16    | COMPREHENSIVE FINAL EXAM Everyone must take |
| 5/15  |            | You did it! |
| 5/15  |            | You did it! |