I. INTRODUCTION

A. This laboratory accompanies Biology 1406 lecture, Biology for Science Majors I. Laboratory activities will reinforce the fundamental principles of living organisms, 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.

B. This lab is part of a course that satisfies the Biology requirement in most curricula. Please check your degree plan to determine the status of this course in your program of study.

C. This course is occupationally related and serves as preparation for careers in science.

D. Prerequisite: TSI Math 350+; ASSET II of 45 or completion of DM0303.

E. Recommended Prerequisite: MATH 1314 Successful completion of College Algebra or concurrent enrollment in higher-level mathematics is recommended.

II. LEARNING OUTCOMES

Upon successful completion of this course, Biology 1406 Biology for Science Majors I, the student will:

A. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.

B. Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.

C. Communicate effectively the results of scientific investigations.

D. Describe the characteristics of life.

E. Explain the methods of inquiry used by scientist.

F. Identify the basic properties of substances needed for life.

G. Compare and contrast the structures, reproduction, and characteristics of viruses, prokaryotic cells, and eukaryotic cells.

H. Describe the structure of cell membranes and the movement of molecules across a membrane.

I. Identify the substrates, products, and important chemical pathways in metabolism.

J. Identify the principles of inheritance and solve classical genetic problems.

K. Identify the chemical structures, synthesis, and regulation of nucleic acids and proteins.
M. Describe the unity and diversity of life and the evidence for evolution through natural selection.

III. INSTRUCTIONAL MATERIALS

A. The instructional materials identified for this course are viewable through www.ctcd.edu/books

IV. COURSE REQUIREMENTS:

A. **Reading Assignments:**
   Students should thoroughly read through each lab exercise prior to lab class and answer/complete parts of the reading that one can as this will ensure timely completion of each of the lab exercises.

B. **Class Performance:**
   Students are expected to attend lab during their regularly scheduled time. It is the responsibility of the student to sign-in during lab time. If for any reason a student cannot or decides not to complete the course, then it is the responsibility of the student to withdraw from the course prior to the withdrawal date. The Instructor will not withdraw/drop a student from the course at any time. If a student ceases to attend class and does not withdraw from the course, then an appropriate course grade will be submitted at the end of the semester.

   The student will be provided a lab schedule that links dates to lab exercises, exams/projects and holidays. If you must be absent from any lab meeting, it is your responsibility to try to compensate for missing the lab experience since there are no lab makeups.

V. **EXAMINATIONS:**
   Students will take lab exams during their regularly scheduled lab time. If a student is late to class on exam day no extra time will be allotted for taking the exam. Each lab period is an opportunity for the student to deepen his/her understanding of some of the key concepts of the course. If a student misses an exam or does poorly on an exam then the student may want to take the optional comprehensive lab final exam that will count in place of one missed exam or one lower exam grade. Other missed exams will result in a zero being recorded in the gradebook. Students are encouraged to come by my office to see which questions were missed on an exam and to seek understanding of the missed material. The opportunity to view a previously taken exam will made available for two weeks after the exam results have been provided to students. Lab exams will not be available for viewing at the end of the semester. Under no circumstances are you allowed to copy the exam, copy questions from the exam, photograph the exam or reproduce the exam in any other way. Reproducing exam questions in any way constitutes scholastic dishonesty which will lead to disciplinary action that may include suspension and expulsion.
VI. SEMESTER GRADE COMPUTATIONS
General Biology 1406 course grade is based on a total of 1000 points.
- UNIT EXAMS- Five @ 100 points each 500 points
- FINAL EXAM- One @ 150 points 150 points
- TOTAL LAB POINTS 350 points
- COURSE TOTAL: 1000 points

COURSE GRADE:
- A- 900-1000 points
- B- 800-899
- C- 700-799
- D- 600-699
- F- 0-599

*There are no opportunities for extra credit.
*To determine one’s standing in the course at any point in time, divide total points earned by total possible points for both lab & lecture.

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR
A. Course Withdrawal: It is the student’s responsibility to officially drop/withdraw from a class if circumstances prevent attendance or if the student decides not to continue with the course and this must be done before the withdrawal date. An instructor cannot initiate a withdrawal or drop a student based on the student’s request. GoArmyEd students should contact their ACES counselor before withdrawing and withdraw through the GoArmyEd portal. All other students who desire to or must officially withdraw from a course on or after the first scheduled class meeting must file an Application for Withdrawal with the local CTC representative by the last date to withdraw. Students enrolled in distance learning courses and who do not have access to a local CTC representative should submit a withdrawal form to EaglesOnCall@ctcd.edu or the CTC Records Office in Killeen, Texas.
*Applications for Withdrawal will be accepted at any time before the completion of the 12th week of classes for 16-week courses, the sixth week of classes for eight-week courses, or the fourth week of classes for six-week courses.
*For non-GoArmyEd active military students, the effective date of withdrawal is the filing date with the Education Center. For all other students, the effective date of withdrawal is the date that the withdrawal application is received by the Central Texas College representative.
*Students who used financial aid, military tuition assistance, VA benefits, or other non-personal funds may be required to repay tuition and fees to the funding agency. For specific repayment requirements, contact the Office of Student Financial Aid or Veterans Services Office before withdrawing. Military tuition assistance students should visit their military Education Center or Navy College Office.
*Students may not withdraw from a class for which the instructor has previously issued a grade of “F.”
B. **Administrative Withdrawal:** A student may be administratively withdrawn by a designated member of the administrative staff of the College under the following conditions:

- The student has been placed on Academic Suspension or Disciplinary Suspension;
- The student has an outstanding financial obligation owed to the college; or
- The student registered for a course without the required prerequisite or departmental permission.

The college is under no obligation to refund tuition and fees, or other costs associated with a student who is administratively withdrawn.

C. **Incomplete Grade:** Incomplete, Course in Progress (for non-developmental courses): An “IP” grade may be assigned by an instructor if a student has made satisfactory progress in a course with the exception of a major quiz, final exam, or other project. The “IP” grade may also be assigned for extenuating circumstances beyond a student’s control such as personal illness, death in the immediate family, military orders, or in the case of distance learning courses, institutional technology failures and mail delays. Notice of absences with supporting documentation may be required by the instructor. The instructor makes the final decision concerning the granting of the incomplete grade. The instructor may set a deadline for completing the remaining course requirements. In no case will the deadline exceed 110 days after the scheduled end of the course. An “IP” grade cannot be replaced by the grade of “W.” If a student elects to repeat the course, the student must register, pay full tuition and fees and repeat the entire course.

At the end of the 110 calendar days if the student has not completed the remaining coursework as required by the instructor, the “IP” will be converted to an “FI” and appear as an “F” on the student’s official transcript. A student who merely fails to show for the final examination will receive a zero for the final and a “F” for the course.

D. **Cellular Phones:** Cellular phones will be turned off while the student is in the classroom or laboratory. Use of a cell phone during an exam will result in a zero for that exam. A student who in any way makes a copy of exam questions will be committing scholastic dishonesty which will lead to disciplinary action that may include suspension and expulsion. The number for your family members to call in an emergency is 254-526-1200. Appropriate personnel will immediately communicate the message to you.
E. **Americans With Disabilities Act (ADA):** Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Explore the website at [www.ctcd.edu/disability-support](http://www.ctcd.edu/disability-support) for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

F. **Instructor Discretion:** The instructor reserves the right of final decision in course requirements.

G. **Civility:** Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in the learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

H. Absolutely no food or drinks in the lecture classroom or the laboratory room.

I. Courtesy dictates that you discuss any problem with your instructor first. If the issue cannot be resolved, then contact the Chair of the Science Department.

VIII. **LAB OUTLINE**

A. Basic Chemistry
B. Water, Solutions, pH & Buffers
C. Modeling Carbon and Chemical Groups
D. Macromolecules
E. Cells
F. Diffusion, Osmosis and Membranes
G. Factors Affecting Enzyme Activity
H. Cellular Respiration
I. Photosynthesis
J. Cell Cycle and Mitosis
K. Meiosis
L. *Brassica rapa*: A Mimic of Mendel’s Peas
M. Genetics of Fruit Flies
N. DNA Structure & Replication of DNA
O. Gene Expression & Protein Synthesis