



Technical College of the Lowcountry  
921 Ribaut Road  
Beaufort, SC 29901

Arts and Sciences Division  
Building 9, Room 102  
843-525-8281

## BIO 100

### Introductory Biology

#### Course Description

This is a course in general biology designed to introduce principles of biology. Biological processes and concepts will be explored through their practical application in the technologies with an emphasis on laboratory techniques.

#### Prerequisites:

4 Cr (3 lect/pres, 1 lab, 0 other)

#### COURSE TOPIC OUTLINE/PURPOSE:

- I. Nature of Biology
- II. Chemistry of Life
- III. Cells & Cellular Processes
- IV. Chromosomes & DNA
- V. Adaptation & Speciation
- VI. Survey of the Kingdoms
- VII. Human Biology

#### Course Focus

#### OBJECTIVES/LEARNING OUTCOMES:

Upon successful completion of this course of study, the student should be competent to perform the following:

1. Describe the structure of DNA and its role in reproduction, evolution, and cellular processes.

Approved/Revised/Updated: 03/14/2016

2. Describe the classification and organization of living things.
3. Describe metabolic and reproductive processes of living things.
4. Describe the structure and processes of living cells.
5. Describe homeostasis in living organisms.
6. Identify major groups of living organisms.
7. Identify reproductive, metabolic, sensory, hormonal, circulatory, and respiratory structures of living organisms.
8. Demonstrate techniques for sampling, culture and identification of living organisms.
9. Describe characteristics of major biochemical classes and chemical reactions in living things.

Specific laboratory skills and methods that will be taught include the following:

1. Metric measurement and English to Metric conversion.
2. Safe laboratory practices - MSDS use, chemical labeling and handling, sanitation
3. Microscopic analysis.
4. Slide preparation - fresh and/or living materials, and preserved specimens.
5. Proper use of the general laboratory apparatus including: incubators, pipettes, Bunsen burners, balances, hot plates, centrifuges, etc.
6. Prepare reagents and culture media.
7. Dissection.
8. Culture methods and staining of bacteria.
9. Use of taxonomic keys for species identification.
10. Determine blood type, heart rate, respiratory rate and blood pressure.

#### Text and References

Life on Earth, 5 th Edition. Audesirk, Audesirk & Byers. Benjamin• ]Cummins, 2009.  
ISBN: 0131755358 / 978• ]0131755352.

#### Course Goals

The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives. (\*designates a CRUCIAL goal)

1. develop appropriate scientific questions.
2. generate relevant justifiable hypotheses.
- \*3. practice safe lab techniques.
- \*4. record accurate scientific measurements.
5. formulate experimental conclusions
6. use lab equipment correctly in scientific investigation.
7. explain life diversity
- \*8. use microscope, balance, ruler, graduated cylinder and thermometer.
9. explain how genetic variability and environmental factor factors lead to biological evolution
10. distinguish between ionic, covalent, hydrogen, and peptide bonds.

- \*11. explain ionic formation.
- \*12. draw ion solvation.
- \*13. justify biological importance of water
14. recognize the structure of ATP.
- \*15. tell biomolecule functions.
16. form biological molecules using dehydration synthesis.
- \*17. predict biomolecule behavior.
- \*18. express biological significance of proteins.
19. recognize hydrolysis and dehydration synthesis reactions.
- \*20. relate membrane structure to function.
21. compare cellular transport mechanisms
- \*22. relate cellular transport to cellular homeostasis
23. identify chemical gradients
24. associate gradients and potential energy
25. recall three major aspects of cell theory.
- \*26. list structure and function of prokaryotic and eukaryotic organelles.
27. identify endergonic and exergonic biochemical processes.
- \*28. identify factors that affect rates of biochemical reactions.
29. interpret photosynthesis equation.
30. summarize photosynthetic reactions.
31. design an original experiment.
32. perform an original experiment.
- \*33. interpret investigational data using graphs.
34. analyze experimental data
35. evaluate experimental results in terms of hypothesis.
36. tell scientific results
- \*37. outline eukaryotic glucose metabolism.
- \*38. relate cell respiration to the overall respiratory process.
39. explain cell differentiation
40. label mitotic phases.
41. match cell cycle characteristics.
42. match meiotic phases with distinguishing characteristics.
43. list consequences of uncontrolled cell division.
44. perform modified DNA separation.
45. predict inheritance of traits.
46. contrast structure and function of DNA and RNA
47. define DNA as protein blueprint.
48. compare consequences of somatic and gametic mutations.
49. justify molecular basis of heredity.
50. recite chromosome theory of inheritance.
- \*51. summarize the relationship among DNA, genes and chromosomes.
- \*52. summarize protein synthesis.
53. apply dna technology to common ethical issues.
54. identify methods of making transgenic organisms.
55. describe common DNA modification techniques.

56. explain animal homeostasis.
- \*57. link organ/ tissue form with function
58. reconcile ATP with body homeostasis.
59. describe human body organization.
60. describe human organ system structure
61. assign function to human organ systems.
62. track physiological change associated with action potential

### Student Contributions

" Blackboard: lecture notes, handouts, syllabi and labs are available on BIO 100 Blackboard page. In addition, you may have access to chat rooms, e mail and other course information on the BIO 100 Web page. It is strongly suggested that each student check the Blackboard at least once daily for course updates and information. It is also strongly encouraged that each student download lecture material before each class. To access the source website, use your web browser to access the log-in page at <http://elearning.tclonline.org:8900>. Click "log-in" and a dialog box opens. Your username is your first initial and last name (all small letters, no spaces) and your password is the first letter of your last name followed by the last THREE digits of your social security number. For assistance with usernames, passwords, or other technical problems, contact the Online Help Desk at 843.525.8344. Assistance is available Sunday-Thursday from 2:00pm-8:00pm.

" Tests: There will be eight (8) Chapter Tests, one (1) Lab Practical, and a comprehensive Final Exam. You must notify the instructor ASAP to be excused from a test, and documentation to excuse the absence must be provided. Failure to make-up the test or obtain an excused absence will cause a zero score for the missed test. Some chapter tests will be in online and dates and times the test will be accessible can be found on the syllabus and will also be discussed in class. The Lab Practical may only be taken in class during the scheduled lab period - no make-ups are possible.

" Comprehension Checks: Throughout the term, there will be open-note comprehension checks posted on Blackboard. Due dates for these quizzes are posted in this syllabus and should be brought to class on the day they are due. The instructor will ask for four of these to be turned in for a grade. Otherwise, these are to be used to supplement lecture. No late comprehension checks will be accepted.

" Laboratory Component: This course has a required lab component that comprises 35% of the final grade. There are three (3) parts to the lab requirements. First, lab hand-outs or reports must be completed for each lab (in class and/or online) and turned in at the end of the semester in a 3-ring binder. The format for submission of lab handouts will be discussed in lab and available online. Second, you will submit one complete lab writeup by the end of the term. Specific criteria and due dates will be announced. Third, there will be one (1) lab practical. This lab performance based test will be given during the last scheduled lab period.

### Course Evaluation

" Method of Evaluation:

Unit Tests	=	350 points
Comprehension Checks	=	100 points

Approved/Revised/Updated: 03/14/2016

Lab Notebook	=	150 points
Lab Practical	=	150 points
Lab report	=	100 points
Final Exam	=	150 points
Total	=	1000 points

Bonus: Bonus opportunities will be given throughout the term. In addition, you may opt to complete the cell model bonus, for up to a possible 25 points added to your grade.

To determine your percent grade, total all the earned points from each of the six (6) categories listed above and divide that number by 1000 points and multiply by 100.

Example: % Grade =  $800/1000 \times 100 = 80\%$ , a "B"

The Values for each letter grade:

100 - 90	A
89 - 80	B
79 - 70	C
69 - 60	D
Below 60	F

Course Schedule

The class meets for 2.5 lecture/presentation hours and 3 lab hours per week.

Developed/Revised : February 16, 2010

### **ADA STATEMENT**

The Technical College of the Lowcountry provides access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation, contact the counselor for students with disabilities at (843) 525-8219 or (843) 525-8242 during the first ten business days of the academic term.

### **ACADEMIC MISCONDUCT**

There is no tolerance at TCL for academic dishonesty and misconduct. The College expects all students to conduct themselves with dignity and to maintain high standards of responsible citizenship.

It is the student's responsibility to address any questions regarding what might constitute academic misconduct to the course instructor for further clarification.

The College adheres to the Student Code for the South Carolina Technical College System. Copies of the Student Code and Grievance Procedure are provided in the *TCL Student Handbook*, the Division Office, and the Learning Resources Center.

## ATTENDANCE

The College's statement of policy indicates that students must attend ninety percent of total class hours or they will be in violation of the attendance policy.

- Students not physically attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.
  - Students taking an online/internet class must sign in **and** complete an assignment designated by the instructor within the first ten calendar days from the start of the semester to indicate attendance in the class. Students not attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.
  - Reinstatement requires the signature of the division dean.
  - In the event it becomes necessary for a student to withdraw from the course **OR if a student stops attending class, it is the student's responsibility to contact the instructor via e-mail requesting to be withdrawn from the class.** Withdrawing from class may have consequences associated with financial aid and time to completion. Students are strongly encouraged to consult with Financial Aid prior to withdrawing from any class, particularly if the student is currently on a warning or probation status.
  - When a student exceeds the allowed absences, the student is in violation of the attendance policy. The instructor **MUST** withdraw the student with a grade of "W", "WP", or "WF" depending on the date the student exceeded the allowed absences and the student's progress up to the last date of attendance
- or
- Under extenuating circumstances and at the discretion of the faculty member teaching the class, allow the student to continue in the class and make-up the work. This exception must be documented at the time the allowed absences are exceeded.
  - Absences are counted from the first day of class. There are no "excused" absences. All absences are counted, regardless of the reason for the absence.
  - A student must take the final exam or be excused from the final exam in order to earn a non-withdrawal grade.

A copy of TCL's **STATEMENT OF POLICY NUMBER: 3-1-307 CLASS ATTENDANCE (WITHDRAWAL)** is on file in the Division Office and in the Learning Resources Center.

## ONLINE ATTENDANCE PROCEDURE

For all online courses, students must complete an assignment designated by the instructor during the first week of classes. The instructor will drop the student from the course if the initial assignment is not completed.

Instructors will withdraw students from the class when 90% attendance is not maintained. Attendance in an online course is defined by regular course access and by timely completion of assignments as required by the instructor. Each student will be expected to access the web class at least once a week and complete 90% of assignments on time. Additional access is encouraged and may be necessary for successful completion of classes.

Failure to log in and complete assignments will result in the student being withdrawn from the course. The instructor will assign a grade of "W," "WP," or "WF" based upon the student's academic standing as the last

date of attendance, which is the last login. Students are responsible for any financial matters associated with an administrative withdrawal. If a student fails to email the instructor (using the my.tcl.edu email account) requesting to be dropped from the course and has not submitted the initial assignment required during the first week of class, the instructor will assign a "Never Attended" code in the student information system (web-advisor) no later than ten calendar days after the first day of the class. Students who are dropped as a result of never attending the course are still responsible for all fees associated with the course.

## **HAZARDOUS WEATHER**

In case weather conditions are so severe that operation of the College may clearly pose a hardship on students and staff traveling to the College, notification of closing will be made through the following radio and television stations: WYKZ 98.7, WGCO 98.3, WGZO 103.1, WFXH 106.1, WWVW 106.9, WLOW 107.9, WGZR 104.9, WFXH 1130 AM, WLVH 101.1, WSOK 1230 AM, WAEV 97.3, WTOC TV, WTGS TV, WJWJ TV, and WSAV TV. Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. <http://www.tcl.edu/current-students/text-alert>

EXTRA:

### **Emergency Text Message Alert**

Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. Participants receive immediate notification of emergency events and weather cancellations via text messaging on their cell phones. Participants can also opt in to receive non-emergency news and announcements. Go to [www.tcl.edu](http://www.tcl.edu). On the homepage, click on "emergency TextAlert at TCL" and fill out the form or go to <http://www.tcl.edu/current-students/text-alert>

## **SAFETY**

### **Purpose.**

The purpose of this safety addendum is to provide each student with safety guidelines during an incident, emergency, or disaster at TCL. In addition, it provides students guidelines for lockdown procedures, evacuation procedures, and active shooter.

### **Definitions**

**An incident** is any event, potential or actual, that may impact normal operations but has no immediate health or life threatening consideration or serious effect on the overall functional capacity of the College. An event of this nature should be reported to the Office of the Vice President for Administrative Services. Also notify the off-site campus administrator if applicable.

**An emergency** is any incident, potential or actual, which may endanger life or health or which affects an entire building or buildings, and will disrupt the overall operations of the College. Outside emergency services will probably be required, as well as major efforts from campus support services. Major policy considerations and decisions will usually be required from the college administration during times of crises. An emergency should be reported immediately by directly using **911** if life or health/injury considerations exist and then to the Office of the President or Vice President for Administrative Services as quickly as possible. Also notify the off-site campus administrator if applicable.

**A disaster** is any event or occurrence that has taken place and has seriously impaired or halted the operations of the College. In some cases, mass personnel casualties and severe property damage may be sustained. A coordinated effort of all campus-wide resources is required to effectively control the situation. Outside emergency services will be essential. In all cases of disaster, an Emergency Control Center will be activated, and the appropriate support and operational plans will be executed. The disaster should be immediately reported, first by calling **911** and then to the Office of the President or Vice President for Administrative Services. Also notify the off-site campus administrator if applicable.

### **Types of Emergencies**

- Hurricane
- Tornado
- Fire
- Biochemical or Radiation Spill
- Explosion/Bomb
- Downed Aircraft (crash which directly impacts campus operations)
- Utility Failures
- Violent or criminal behavior
- Psychological Crisis

### **Procedures:**

#### **Active Shooter**

Run/hide/fight (<http://www.fbi.gov/about-us/cirg/active-shooter-and-mass-casualty-incidents/run-hide-fight-video>)

#### **Building Evacuation**

1. Building evacuations occur when an alarm sounds and/or upon notification by Security or the Emergency Director.
2. When the building evacuation alarm is activated during an emergency, individuals should exit according to the building evacuation plan and alert others to do the same.
3. Once outside, individuals should proceed to a clear area that is at least 500 feet away from the affected building. Streets, fire lanes, hydrant areas and walkways should be kept clear for emergency vehicles and personnel.
4. Individuals should not return to an evacuated building unless told to do so by Security or the Emergency Director.
5. Individuals should assist persons with disabilities in exiting the building. Elevators are reserved for disabled persons

#### **Campus Evacuation**

1. A uniformed Security Guard, the Emergency Director, or an Emergency Resource Team member will announce evacuation of all or part of the campus grounds.
2. All persons (students and staff) are to immediately vacate the campus, or in the case of a partial evacuation relocate to another part of the campus grounds as directed.

Approved/Revised/Updated: 03/14/2016

**Lockdown**

1. Clear the halls
2. Report to the nearest classroom/office
3. Assist those needing special assistance
4. Ensure classroom/office doors are closed and locked
5. Turn off lights
6. Stay away from doors and windows (out of the line of sight)
7. BE QUIET and follow instructor's directions
8. Silence cell phones
9. Wait for the "All Clear" before leaving