



**Microbiology Lab – BIOLOGY (BIOL) 2117L**  
**COURSE SYLLABUS**  
**HYBRID**  
**Summer Semester 2022**

**COURSE INFORMATION**

Credit Hours/Minutes: 1/2250

Class Location: Vidalia Campus/Health Sciences Annex (HSA) – Building C: Room 902

Class Meets: Monday 12:30 pm-4:00 pm (**Hybrid format**: 60% face to face in class & 40% online).

Course Reference Number (CRN): 60184

Preferred Method of contact: Email (ssturgis@southeasterntech.edu)

**INSTRUCTOR CONTACT INFORMATION**

Instructor Name: Sherry Sturgis

Email Address: ssturgis@southeasterntech.edu

Campus/Office Location: Vidalia Campus/HSA – Building C: Room 901

Office Hours: by appointment

Phone: (912)538-3188

Tutoring Hours: By appointment

**This course is taught in a hybrid format. Hybrid classes require students to complete a portion of the required contact hours traditionally by attending classes on campus while completing the remaining portion online at the student's convenience with respect to the instructor's requirements.**

**SOUTHEASTERN TECHNICAL COLLEGE'S (STC) CATALOG AND HANDBOOK**

Students are responsible for all policies and procedures and all other information included in Southeastern Technical College's [Catalog and Handbook](http://www.southeasterntech.edu/student-affairs/catalog-handbook.php) (<http://www.southeasterntech.edu/student-affairs/catalog-handbook.php>).

**REQUIRED TEXT**

1. Burton's Microbiology for the Health Sciences; Tenth Edition 1-2842-4253-6, Engelkirk and Burton: Copyright 2011.
2. Introductory to Microbiology 2117 Lab Workbook – First Edition (available in bookstore only)

**REQUIRED SUPPLIES & SOFTWARE**

Reliable internet access, laptop with functional camera/webcam (bring laptop **with charger** to all lecture & lab meetings). [Clear front report cover](#), ink pens, highlighter, colored pencils, and any other supplies deemed necessary by the instructor.

**Note:** Although students can access their online course using their smart phones and tablets, **graded activities** such as **exams, discussions, assignments, etc. should be performed on a personal computer**. Neither Blackboard nor Georgia Virtual Technical Connection (GVTC) provide technical support for issues relating to the use of a smart phone or tablet, so students are advised not to rely on these devices to take an online course.

**Students should not share login credentials with others and should change passwords periodically to maintain security.**

## **COURSE DESCRIPTION**

Selected laboratory exercises paralleling the topics in BIOL 2117. The laboratory exercises for this course include microbial diversity, microbial cell biology, microbial genetics, interactions and impact of microorganisms and humans, and microorganisms and human disease.

## **MAJOR COURSE COMPETENCIES**

1. Laboratory Safety
2. Microscope Use
3. Aseptic Technique
4. Microbial Growth
5. Microbial Diversity
6. Microbial Cell Biology
7. Microbial Genetics
8. Interactions and Impact of Microorganisms and Humans

## **PREREQUISITE(S)**

BIOL 2113 and BIOL 2113L OR BIOL 1111 and BIOL 1111L

## **COREQUISITE(S)**

BIOL 2117L

## **COURSE OUTLINE**

### **Laboratory Safety**

1. Discuss and apply laboratory exercises encompassing the appropriate practice of laboratory precautions and laboratory safety.

### **Microscope Use**

1. Discuss and use laboratory exercises encompassing proper care and use of the microscope.

### **Aseptic Technique**

1. Discuss and use laboratory exercises encompassing the practice and utilization of aseptic technique. For example: Evaluate sterility testing procedures.

### **Microbial Growth**

1. Discuss and use laboratory exercises encompassing control of microbial growth. Examples include: estimating the number of microbes in a culture medium by both direct and indirect methods, using appropriate microbiological media and test systems, cultivating specific microorganisms in various media.

### **Microbial Diversity**

2. Perform and apply laboratory exercises encompassing microbial diversity. For example: Use staining techniques to classify specific organisms.

### **Microbial Cell Biology**

1. Perform and apply laboratory exercises encompassing microbial cell biology. Examples include: identifying common gram negative and gram positive bacteria, executing various staining techniques in order to study the morphology of microorganisms.

### **Microbial Genetics**

1. Perform and apply laboratory exercises encompassing microbial genetics.

### **Interactions and Impact of Microorganisms and Humans**

1. Perform and apply laboratory exercises encompassing interactions and impact of microorganisms and

humans. Examples include: determining antibiotic sensitivity, determining the impact of various disinfectants and antiseptics on microorganisms, and performing tests for detecting microbial infections.

## GENERAL EDUCATION CORE COMPETENCIES

Southeastern Technical College has identified the following general education core competencies that graduates will attain:

1. The ability to utilize standard written English.
2. The ability to solve practical mathematical problems.
3. The ability to read, analyze, and interpret information.

## STUDENT REQUIREMENTS

Students are responsible for the policies and procedures in the Southeastern Technical College's (STC's) Catalog and Handbook. Students are expected to prove weekly academic engagement by meeting assignment deadlines each week and spending a minimum of 2 hours per day during the semester doing the required homework, assignments, and assessments. Students are expected to complete all work required by the instructor and follow online testing instructions and guidelines.

**STC Email:** Students are expected to communicate frequently through STC email. The instructor will utilize **ONLY STC email** for correspondence and share pertinent information to enable successful completion of the course.

## NO EATING/DRINKING IS ALLOWED IN LAB OR CLASSROOMS.

Students are expected to exhibit professional behavior at all times. Each student must show respect and concern for fellow students and for the course instructor. Insubordination will not be tolerated, and disciplinary measures will be enacted. No cell phones or pagers are allowed to be turned on in the classroom. Personal phone calls must be handled after class. Watches with alarms should not be programmed to sound during class.

## COVID-19 MASK REQUIREMENT

Regardless of vaccination status, students are highly encouraged to wear masks or face coverings while in a classroom or lab at Southeastern Technical College. Masking may be implemented in some program areas (i.e. Health Sciences and Cosmetology) where students, faculty, and clients are in close proximity and social distancing cannot be maintained. This measure is being implemented to reduce COVID-19 related health risks for everyone engaged in the educational process. Masks or face coverings must be worn over the nose and mouth, in accordance with the Centers for Disease Control and Prevention (CDC).

## COVID-19 SIGNS AND SYMPTOMS

We encourage individuals to monitor for the signs and symptoms of COVID-19 prior to coming on campus. If you have experienced the **symptoms listed below** or have a **body temperature 100.4°F or higher**, we encourage you to self-quarantine at home and contact a primary care physician's office, local urgent care facility, or health department for further direction. **Please notify your instructor(s) by email and do not come on campus for any reason.**

COVID-19 Key Symptoms
Fever or felt feverish
Chills
Shortness of breath or difficulty breathing (not attributed to any other health condition)

<b>COVID-19 Key Symptoms</b>
Fatigue
Muscle or body aches
Headache
New loss of taste or smell
Sore throat (not attributed to any other health condition)
Congestion or runny nose (not attributed to any other health condition)
Nausea or vomiting
Diarrhea
<b>In the past 14 days, if you:</b>
Have had close contact with or are caring for an individual diagnosed with COVID-19 at home (not in healthcare setting), please do not come on campus and contact your instructor (s).

### **COVID-19 SELF-REPORTING REQUIREMENT**

Students taking classes on campus, who test positive for COVID-19 or who have been exposed to a COVID-19 positive person, are required to self-report using the [COVID 19 Health Reporting Form](#). Report all positive cases of COVID-19 to your instructor and [Stephannie Waters](#), Exposure Control Coordinator, [swaters@southeasterntech.edu](mailto:swaters@southeasterntech.edu), 912-538-3195.

### **HYBRID ATTENDANCE**

Class attendance is a very important aspect of a student's success. Being absent from class prevents students from receiving the full benefit of a course and interrupts the learning process. Southeastern Technical College considers both tardiness and leaving early as types of absenteeism. Responsibility for class attendance rests with the student. Regular and punctual attendance at all scheduled classes is required for student success. Students will be expected to complete all work required by the instructor as described in the individual course syllabus.

Instructors have the right to give unannounced quizzes/assignments. Students who miss an unannounced quiz or assignment will receive a grade of 0. Students who stop attending class, but do not formally withdraw, may receive a grade of "F" (Failing 0-59) and face financial aid repercussions in upcoming semesters.

Instructors are responsible for determining whether missed work may be made up and the content and dates for makeup work is at the discretion of the instructor.

Students will not be withdrawn by an instructor for attendance; however, all instructors will keep records of graded assignments and student participation in course activities. The completion dates of these activities will be used to determine a student's last date of attendance in the event a student withdraws, stops attending, or receives an "F" in a course.

### **STUDENTS WITH DISABILITIES**

Students with disabilities who believe that they may need accommodations in this class based on the impact of a disability are encouraged to contact the appropriate campus coordinator to request services.

Swainsboro Campus: [Daphne Scott](#) ([dscott@southeasterntech.edu](mailto:dscott@southeasterntech.edu)) 478-289-2274, Building 1, Room 1210.

Vidalia Campus: [Helen Thomas](#) ([hthomas@southeasterntech.edu](mailto:hthomas@southeasterntech.edu)), 912-538-3126, Building A, Room 165.

## SPECIFIC ABSENCES

Provisions for instructional time missed because of documented absences due to jury duty, military duty, court duty, or required job training will be made at the discretion of the instructor.

## PREGNANCY

Southeastern Technical College does not discriminate on the basis of pregnancy. However, we can offer accommodations to students who are pregnant that need special consideration to successfully complete the course. If you think you will need accommodations due to pregnancy, please make arrangements with the appropriate campus coordinator.

Swainsboro Campus: [Daphne Scott \(dscott@southeasterntech.edu\)](mailto:dscott@southeasterntech.edu) 478-289-2274, Building 1, Room 1210.  
Vidalia Campus: [Helen Thomas \(hthomas@southeasterntech.edu\)](mailto:hthomas@southeasterntech.edu), 912-538-3126, Building A, Room 165.

It is strongly encouraged that requests for consideration be made **PRIOR** to delivery and early enough in the pregnancy to ensure that all the required documentation is secured before the absence occurs. Requests made after delivery MAY NOT be accommodated. The coordinator will contact your instructor to discuss accommodations when all required documentation has been received. The instructor will then discuss a plan with you to make up missed assignments.

## WITHDRAWAL PROCEDURE

Students wishing to officially withdraw from a course(s) or all courses after the drop/add period and prior to the 65% point of the term in which student is enrolled (date will be posted on the school calendar) must speak with a Career Counselor in Student Affairs and complete a Student Withdrawal Form. A grade of "W" (Withdrawn) is assigned for the course(s) when the student completes the withdrawal form.

**Important** – Student-initiated withdrawals are not allowed after the 65% point. After the 65% point of the term in which the student is enrolled, the student has earned the right to a letter grade and will receive a grade for the course. Please note: Abandoning a course(s) instead of following official withdrawal procedures may result in a grade of "F" (Failing 0-59) being assigned.

**Informing your instructor that you will not return to his/her course, does not satisfy the approved withdrawal procedure outlined above.**

There is no refund for partial reduction of hours. Withdrawals may affect students' eligibility for financial aid for the current semester and in the future, so a student must also speak with a representative of the Financial Aid Office to determine any financial penalties that may be assessed due to the withdrawal. A grade of "W" will count in attempted hour calculations for the purpose of Financial Aid.

**Remember - Informing your instructor that you will not return to his or her course does not satisfy the approved withdrawal procedure outlined above.**

## FINAL EXAMINATION/FINALS ELIGIBILITY

A comprehensive final examination will be given at the end of the semester. All students in the course will complete the Final Exam on the specified date and time as stipulated in the Lesson Plan outline. The Final Exam will be timed. There will be **no make-up exam** for the Final Examination. In order to be eligible to take the final exam, a student must maintain a **Lecture and Lab Test average of seventy percent (70%) or above prior to the date of the scheduled final exam.** Grades of 69.9% will not be rounded up. If the student has below a 70% average, the student will be given a letter grade based on Tests average. Assignments, lab projects, Blackboard assignments etc. are **not** included in tests averages, **only tests grades.** There will be no drop grade for this class.

## **MAKEUP GUIDELINES FOR MISSED EXAM**

Students will be allowed to make-up **one** examination, EXCLUDING the final examination, due to an extenuating circumstance. This should be discussed with the instructor. Please submit official copy of medical, court documentation/jury duty, or any other formal written documents supporting the reason for missing a test. **Any other test missed will result in an automatic grade of zero.** If Internet or browser failure occurs while testing, contact instructor immediately via phone (leave a message if necessary) and email later after internet connection is resolved. A decision will be made at that time if the assignment/test will be reset. **Note:** If student notifies instructor regarding inability to complete assignments/tests because of technical problems after due date, the student will **NOT** be allowed to make-up assignments/tests.

Laboratory activities and experiments: There will be no make-up opportunity for missed lab activities, in-class assignments, experiments, dissections, etc.

Research assignment: The research assignment will not be accepted late. No exceptions.

## **ASSIGNMENTS**

### **Lab Notebook:**

A laboratory notebook will be created by each student using a clear front report cover/binder with dividers (see required supplies page 1 of syllabus). This lab notebook will include all completed lab worksheets taken from lab workbook, handouts or assignments completed in lab, and all microscopic slide observations. Lab notebooks are due at the **end of each lab session** and all completed lab work should be submitted bound in a clear front report cover/binder. **All assignments completed in the lab must be turned in on the day assigned.** Lab reports will remain in the lab in a locked cabinet until the next lab session. Lab notebooks will be not be taken home for any reason.

The first page of the notebook (or in the front sleeve of the clear front lab report cover) will include (in typewritten format): Student's full name, course name, course number, semester, and year in the above-mentioned order.

Notebooks are checked weekly and points will be deducted for any missing assignment.

## **ACADEMIC DISHONESTY POLICY**

The Southeastern Technical College Academic Dishonesty Policy states that all forms of academic dishonesty, including but not limited to cheating on tests, plagiarism, collusion, and falsification of information, will call for discipline. The policy can also be found in the Southeastern Technical College Catalog and Handbook.

## **PROCEDURE FOR ACADEMIC MISCONDUCT**

The procedure for dealing with academic misconduct and dishonesty is as follows:

### **1. First Offense**

Student will be assigned a grade of "0" for the test or assignment. Instructor keeps a record in course/program files and notes as first offense. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus. The Registrar will input the incident into Banner for tracking purposes.

### **2. Second Offense**

Student is given a grade of "WF" (Withdrawn Failing) for the course in which offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of second offense. The Registrar will input the incident into Banner for tracking purposes.

### 3. Third Offense

Student is given a grade of "WF" for the course in which the offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of third offense. The Vice President for Student Affairs, or designee, will notify the student of suspension from college for a specified period of time. The Registrar will input the incident into Banner for tracking purposes.

### STATEMENT OF NON-DISCRIMINATION

The Technical College System of Georgia (TCSG) and its constituent Technical Colleges do not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, political affiliation or belief, genetic information, disabled veteran, veteran of the Vietnam Era, spouse of military member, or citizenship status (except in those special circumstances permitted or mandated by law). This nondiscrimination policy encompasses the operation of all technical college-administered programs, federally financed programs, educational programs and activities involving admissions, scholarships and loans, student life, and athletics. It also applies to the recruitment and employment of personnel and contracting for goods and services.

All work and campus environments shall be free from unlawful forms of discrimination, harassment and retaliation as outlined under Title IX of the Educational Amendments of 1972, Title VI and Title VII of the Civil Rights Act of 1964, as amended, the Age Discrimination in Employment Act of 1967, as amended, Executive Order 11246, as amended, the Vietnam Era Veterans Readjustment Act of 1974, as amended, Section 504 of the Rehabilitation Act of 1973, as amended, the Americans With Disabilities Act of 1990, as amended, the Equal Pay Act, Lilly Ledbetter Fair Pay Act of 2009, the Georgia Fair Employment Act of 1978, as amended, the Immigration Reform and Control Act of 1986, the Genetic Information Nondiscrimination Act of 2008, the Workforce Investment Act of 1998 and other related mandates under TCSG Policy, federal or state statutes. The Technical College System and Technical Colleges shall promote the realization of equal opportunity through a positive continuing program of specific practices designed to ensure the full realization of equal opportunity.

The following individuals have been designated to handle inquiries regarding the nondiscrimination policies:

<b>American With Disabilities Act (ADA)/Section 504 - Equity- Title IX (Students) – Office of Civil Rights (OCR) Compliance Officer</b>	<b>Title VI - Title IX (Employees) – Equal Employment Opportunity Commission (EEOC) Officer</b>
Helen Thomas, Special Needs Specialist Vidalia Campus 3001 East 1 <sup>st</sup> Street, Vidalia Office 108 Phone: 912-538-3126 Email: <a href="mailto:Helen.Thomas@southeasterntech.edu">Helen Thomas</a> <a href="mailto:hthomas@southeasterntech.edu">hthomas@southeasterntech.edu</a>	Lanie Jonas, Director of Human Resources Vidalia Campus 3001 East 1 <sup>st</sup> Street, Vidalia Office 138B Phone: 912-538-3230 Email: <a href="mailto:Lanie.Jonas@southeasterntech.edu">Lanie Jonas</a> <a href="mailto:ljonas@southeasterntech.edu">ljonas@southeasterntech.edu</a>

### ACCESSIBILITY STATEMENT

Southeastern Technical College is committed to making course content accessible to individuals to comply with the requirements of Section 508 of the Rehabilitation Act of Americans with Disabilities Act (ADA). If you find a problem that prevents access, please contact the course instructor.

### GRIEVANCE PROCEDURES

Grievance procedures can be found in the Catalog and Handbook located on Southeastern Technical College's website.

## ACCESS TO TECHNOLOGY

Students can now access Blackboard, Remote Lab Access, Student Email, Library Databases (Galileo), and BannerWeb via the mySTC portal or by clicking the Current Students link on the [Southeastern Technical College \(STC\) Website \(www.southeasterntech.edu\)](http://www.southeasterntech.edu).

## TECHNICAL COLLEGE SYSTEM OF GEORGIA (TCSG) GUARANTEE/WARRANTY STATEMENT

*The Technical College System of Georgia guarantees employers that graduates of State Technical Colleges shall possess skills and knowledge as prescribed by State Curriculum Standards. Should any graduate employee within two years of graduation be deemed lacking in said skills, that student shall be retrained in any State Technical College at no charge for instructional costs to either the student or the employer.*

## GRADING POLICY

Assessment/Assignment	Percentage
Lab Exams	50%
Lab Workbook & Discussion Board	10%
Lab Assignments (#1-#5)	10%
Final Exam	30%

## GRADING SCALE

Letter Grade	Range
A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

## DISCLAIMER STATEMENT

**Instructor reserves the right to change the syllabus and/or lesson plan as necessary. The official copy of the syllabus is located on the STC M-Drive and will be discussed on the first day of class. The syllabus with chapter assignments, dates, tests, & competency (comp) are displayed in advance of the semester in any location is for planning purposes only.**

# Microbiology Lab – BIOL 2117L

## Summer Semester 2022 Lesson Plan

*Subject to change at instructor's discretion. Any updates will be distributed in class.*

Date	Chapter (Ch)	Content	Assignments (Asgmts.), Homework & Tests Due Dates	Comp Area
Tue 05/16	Lab 1 Ch 1-4	<p>Introduction to lab, syllabus review &amp; lab safety.</p> <ul style="list-style-type: none"> <li>Petri dish inoculation</li> <li>Bacterial Shapes</li> <li>Robert Koch's Postulates</li> </ul> <p><u>Include in clear front lab report:</u>            1<sup>st</sup> page: Name, Course, CRN #, semester, &amp; year            2<sup>nd</sup> page: Lab safety handout (signed)            3<sup>rd</sup> page: Group Presentation Topic, list members/contact            4<sup>th</sup> Completed lab workbook assignments Ch 1-5.</p> <p><b>Hybrid</b>-You must respond to the question in the discussion board weekly. This is posted by the instructor regarding the topics of study.</p>	<p>Lab Workbook asgmts. are completed at home. These asgmts. are submitted in clear front lab report at the end of each day.</p> <p>Ch 1-4 Workbook asgmts. due 5/23</p> <p><b>Submit all completed work in clear front lab report. Lab reports do not go home!</b></p> <p>Reminder: bring laptops &amp; <u>charger</u> to all class meetings.</p>	CC 1-5 GC 1-3
5/23	Lab 2 Ch 5-8	<ul style="list-style-type: none"> <li>Intro to Gram Stain/Slide prep/observation</li> <li>Pond water observation</li> </ul> <p><u>Print</u> "Control of Microbial growth: M drive, <u>Bring</u> microbial agents for next lab.</p>	<p>Lab Workbook Ch 5-8 due 6/6</p> <p><i>Students are encouraged to work ahead &amp; complete workbook assignments for upcoming chapters to submit in lab report.</i></p>	CC 1-5 GC 1-3
5/30		<b>Memorial Day Holiday</b>	<b>No Class</b>	
06/6	Lab 3 Ch 9-11	<ul style="list-style-type: none"> <li>Intro to Dichotomous keys (animal/plant virus)</li> <li>Pioneers in Microbiology Activity</li> <li><b>Lab Asgmt. #1:</b> Control of Microbial Growth</li> </ul>	<p><b>Lab Exam 1: Ch. 1-7</b></p> <p>Lab Workbook Ch 9-11 due 7/11</p> <p><b>Place all Lab Asgmts (#1-#5) in lab report.</b></p>	CC 1-5 GC 1-3
06/13	Lab 4 Ch 12-13	<p>Dental Hygiene report to Dr. J. Gramiak: Skill Evaluations.</p> <p>See <u>Lecture Syllabus</u> for details.</p>	<p>Lab Workbook Ch 12-13 due 7/11</p> <p><u>Print</u> from M Drive &amp; complete:</p> <p><b>Lab Asgmt. #2:</b> Immunology due 7/11</p>	CC 1-8 GC 1,3
06/20	n/a	Holiday-No Class	n/a	n/a
06/27	Lab 5 Ch 14-15	<p>Dental Hygiene report to Dr. J. Gramiak: Skill Evaluations.</p> <p>See <u>Lecture Syllabus</u> for details.</p>	<p>Lab Workbook Ch 14-15 due 7/11</p> <p><u>Print</u> from M Drive &amp; complete:</p> <p><b>Lab Asgmt. #3:</b> Pinworms due 7/11</p>	CC 1-8 GC 1,3
07/04		Fourth of July Holiday	No class	
07/11	Lab 6 Ch 16-18	<p>Dental Hygiene report to Dr. J. Gramiak: Skill Evaluations.</p> <p>See <u>Lecture Syllabus</u> for details.</p>	<p><b>Lab Exam 2: Ch. 8-14</b></p> <p>Lab Workbook Ch 16-18 due 7/18</p> <p><u>Print</u> from M Drive &amp; complete:</p> <p><b>Lab Asgmt.#4:</b>Parasitic Life Cycle due 7/18</p> <p><u>Print</u> from M Drive &amp; bring to lab.</p> <p><b>Lab Asgmt.#5:</b> Handwashing asgmt.</p>	CC 1-8 GC 1,3

Date	Chapter (Ch)	Content	Assignments (Asgmts.), Homework & Tests Due Dates	Comp Area
07/18	Lab 7 Ch 19-21	<u>Print</u> Handwashing Lab Experiment for today. <ul style="list-style-type: none"> <li>Tuberculosis</li> <li>Cross contamination activity &amp; videos</li> </ul> Petri Dish Plate prep: Handwashing Protocol with Lab experiment/asgmt.#5 <ul style="list-style-type: none"> <li>Antibiotic Resistance Activity</li> <li>Parasites (endo/ecto) observation</li> </ul>	<b>Lab Exam 3: Ch. 15-21</b> Lab Workbook Ch 19-21 due 7/25 <i>All Workbook asgmts. &amp; all Lab asgmts. #1-#5 should be in lab report. Points deducted for late submission after today.</i>	CC 1-8 GC 1-3
07/25	Lab 9 Ch 1-21	Review Hand experiment/record findings. Asgmt #5 Lab Final – COMPREHENSIVE (ALL CHAPTERS) Make up exam day – see syllabus for details	Comprehensive Final	CC 1-8 GC 1-3

#### COMPETENCY AREAS:

1. Laboratory Safety
2. Microscope Use
3. Aseptic Technique
4. Microbial Growth
5. Microbial Diversity
6. Microbial Cell Diversity
7. Microbial Genetics
8. Interactions and Impact of Microorganisms and Humans

#### GENERAL CORE EDUCATIONAL COMPETENCIES:

- a) The ability to utilize standard written English.
- b) The ability to solve practical mathematical problems.
- c) The ability to read, analyze, and interpret information.