Semester and year: 
Course Number: 
Meeting Times and Locations: 

Instructor: 
Office Location: 
Phone: 
Office Hours: 
Email Address: 

COURSE TITLE: BIO 104 Microbiology 
COURSE COORDINATOR: Marty Lowe 
COURSE CREDIT: 4 CREDITS, 3 LEC, 3 LAB. 
GENERAL ED COURSE: Yes 
PREREQUISITES: None (High School biology and/or chemistry essential) 
COURSE DESCRIPTION: Microbiology is a laboratory science course that emphasizes the principles of biology as they apply to microorganisms. The morphology, anatomy, physiology, growth, metabolism, nutrition, control and identification of the various microbes, genetics including recombination technology, industrial and clinical case studies in microbiology discussed. Representative laboratory exercises include staining procedures, media preparation, pure culture techniques, culture identification, and serology. 


All lab books must be new and unused. 
All students must wear protective eye wear, vinyl gloves and laboratory coats 

OPTIONAL: Lammert, Techniques in Microbiology, Pearson, 2007 

ACCOMMODATIONS: Students who require accommodations in accordance with the Americans with Disabilities Act (ADA) can request these services from the Office of Specialized Services. To learn more about how to apply for services, please visit them at: http://www.bergen.edu/oss
MATERIALS: All students must wear protective eye wear, vinyl gloves and laboratory coats. All lab books must be new and unused.

CLASS OBJECTIVES: To acquire an understanding of the general principles of microbiology and the role of microbes in our universe and to become proficient in the techniques for observing, cultivating, enumerating, isolating, and identifying these organisms.

STUDENT LEARNING OBJECTIVES:

1. Students will examine the major principles of microbiology and the relationship of microbes to other living organisms. Assessment will be based upon performance on exam questions. Assessment can also be based on research papers/projects.
2. Students will demonstrate proper scientific procedure to identify various type of microbes. Students will be evaluated by observation in the laboratory and analysis of an unknown bacterium. Assessment will also be based upon performance on exam questions.
3. Students will be able to explain the scientific basis for each technique used. Students will be required to answer exam questions designed to allow them to demonstrate their acquisition and retention of this knowledge.
4. Students will report data using proper scientific laboratory record keeping. Students will be evaluated by periodic notebook collection.
5. Students will model critical thinking skills and apply them to both material presented in lecture and the analysis of data generated in the laboratory. Students will be evaluated by observation in the laboratory and analysis of experimental results. Assessment will also be based upon performance on exam questions.

TEACHING METHODS:

1. Lecture
2. Discussion
3. PowerPoint Presentations
4. Videos/You Tube/Skype
5. Illustrations
6. Diagrams/Tables/Flow Charts
7. Web enhancement by Moodle Rooms or Echo Capture

LEARNING EXPERIENCES/ACTIVITIES:

1. Aseptic technique
2. Hand washing technique
3. Bacterial growth
4. Isolation for pure culture
5. Bacterial Identification
6. Identification of worms, Protozoans and fungi.
7. Pre and post lab record keeping

Henry and Edith Cerullo Learning Assistant Center: For tutoring help please go to L-125. Tutoring is available for every Bergen student. Their phone number is 201-447-7489.
COURSE ASSESSMENT: The student will be evaluated using a variety of methods which may include, but are not limited to, some of the following: quizzes, exams, written assignments, lab practices, laboratory skills, record keeping and research projects and presentations.


Note: The Lecture portion of class is worth 60% of the course grade and the Laboratory portion of the class is worth 40% of the course grade.

**STUDENT EVALUATION: **Professor's Discretion

**Lecture:**
1. Lecture tests .................................................. ___% 
2. Comprehensive Final Examination .............. ___% 
3. Research Project/presentation .................. ___% 
4. Lecture quizzes ............................................. ___% 

**Laboratory:**
1. Midterm Exam (written) ................................. ___% 
2. Final Exam (written) ................................. ___% 
3. Laboratory Practical Exam .............................. ___% 
4. Pre and Post Laboratory notebook .............. ___% 
5. Laboratory Unknown ........................................ ___% 
6. Lab quizzes .................................................... ___% 
7. Observation

If you have a medical condition or develop a medical condition during this semester, which prevents you from fulfilling the requirements of this course, you must notify your physician. You and your physician must decide whether or not it is appropriate for you to remain in this course. If the decision is to remain in this course, please obtain a letter from your physician indicating that your continued participation in this course is appropriate and present it to the Department Chair.

You have registered for a Web Enhanced course.

To enter go to: moodle.bergen.edu and enter your username and password and click Login. You must log into your course using the following guidelines for your username and password. This is the only way you can enter your course – you cannot change your username or password or you will not be able to log in.

1) Your user name is the same as your WebAdvisor username.

2) Your password is up to first 8 letters of your last name followed by last 4 digits of your BCC ID. Type the first initial of your last name in uppercase. Example: John O'Shaughnessy & BCC ID# 1071234 = Oshaughn1234.

You can access your course from the Courses Available To You block. Click the + sign to expand the term and you will find your course(s).

Unless you are on campus, you are responsible for supporting your own Internet access and email account throughout the course.

If after following these instructions you still have difficulty logging in, please call the help desk at 1-877-612-5381.
**All lab books must be new and unused.**

**All students must wear protective eye wear, vinyl gloves and laboratory coats**

**No handheld devices are allowed at student work benches.**

**SEQUENCE OF WEEKLY CHAPTERS FOR MICROBIOLOGY**

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Chapter 1 - The Microbial World and You</th>
<th>Chapter 2 - Begin Chemical Principles</th>
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<tr>
<td>Week 2</td>
<td>Chap. 2,3, - Chemical Principles</td>
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<td>Week 4</td>
<td>Chapter 5 - Microbial Metabolism</td>
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<td>Chapter 9 - Recombinant DNA and Biotechnology (Applications of Genetic Engineering)</td>
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<td>Week 7</td>
<td>Chapter 10 - Classification of Microorganisms</td>
<td>Chapter 11&amp;12 - Overview of Bacteria, Fungi, Algae, Protozoans, Multicellular Parasites</td>
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<td>Week 8</td>
<td>Chapter 14 - Principles of Disease and Epidemiology</td>
<td>Chapter 15 - Mechanisms of Pathogenicity</td>
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<td>Week 9</td>
<td>Chapter 16 - Nonspecific Defenses of the Host</td>
<td>Chapter 17 - Specific Defenses of the Host: The Immune Response</td>
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<td>Chapter 18 - Practical Applications of Immunology</td>
<td>Chapter 20 - Antimicrobial Drugs</td>
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<td>Week 11</td>
<td>*Chap. 21-22 - Microorganisms and Human Disease</td>
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<td><strong>Week 12 + 13</strong></td>
<td>*Chap. 23-24 - Microorganisms and Human Disease</td>
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<td>Week 14</td>
<td>Chap.25,26,28 - Applied and Industrial Microbiology</td>
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<tr>
<td><strong>Week 15</strong></td>
<td>- FINAL EXAMS</td>
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*Specific diseases discussed based on the professor's discretion*
Laboratory attendance is mandatory; health related issues should be addressed with a doctor.

All lab books must be new and unused.
All students must wear protective eye wear, vinyl gloves and laboratory coats
No handheld devices are allowed at student work benches.

<table>
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<tr>
<th>Week</th>
<th>Lab Title</th>
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<td>Prep. and care of stock cultures and aseptic tech.</td>
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<td>Cultural Characteristics Of Bacteria</td>
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<td>Smear Prep</td>
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<td></td>
<td>Capsule Stain</td>
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<td>Negative Stain</td>
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<td></td>
<td>Simple Stain</td>
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<td>3</td>
<td>Smear prep</td>
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<td>Spore Stain</td>
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<td>Acid-Fast Stain</td>
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<td>4</td>
<td>Isolating pure cultures</td>
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<td>Staphylococci</td>
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<td>Streptococci</td>
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<td>Motility</td>
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<td>Working with Media</td>
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<td>Differential and Selective Media</td>
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<td></td>
<td>Gram Stain</td>
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<td>6</td>
<td>Bacteria on the skin</td>
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<td>Bacteria in Water</td>
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<td>Effect of Temperature on Growth</td>
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<td>Parasitic Worm Infections</td>
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Unknown Bacteria

Gram Stain

Knowns

Unknowns

Read Known Results

Read Unknown Results

Antimicrobics

Effect of Antiseptics And Disinfectants

Turn in Unknown

Read lab 34 and 35

Gram Stain

Lab Practical**

Lab final and final Gram Stain**

** Professor's Discretion

*Additional Labs may include the following:
- Bacterial Population Counts - Lab 15
- Bacterial Population Counts – Lab 25
- Bacteria in Food – Lab 26
- Yogurt making
- Wine making (to demonstrate fermentation only)
- Temperature and Its Effect on Microbial Growth - Exercise 34
- Enterotubes - Exercise 53
- Spoiled Canned Foods - Exercise 70
- Bacteria in the soil - Handout
- Microscopic View of Milk - Exercise 67

Cultures used in lab are:

- *Staphylococcus aureus*
- *Serratia marcescens*
- *Proteus vulgaris*
- *Klebsiella pneumonia*
- *Enterococcus faecalis*
- *Bacillus subtilis*
- *Bacillus sterothermophilus*
- *Saccharomyces cerevisias*  

- *Staphylococcus epidermidis*
- *Pseudomonas aeruginosa*
- *Micrococcus luteus*
- *Escherichia coli*
- *Enterobacter aerogenes*
- *Bacillus megaterium*
- *Pseudomonas flourscens*
HOW TO STUDY SCIENCE

Here are some basic tips on how to study for a science class.

1. Keep a journal of how much you study every day. Even if you only put in five minutes, log that information. **Turn this information in with the first test** and it will help us discuss how you are doing in the course. Remember this is a 6 hour/4 credit lab/lecture science class. You will spend more time on this class than you would a 3 hour/3credit class.

2. READ, READ, READ! Be sure and read your chapters before the lecture material is discussed in class. Note any words you do not understand and look them up. If you have questions jot them down. If the question isn’t answered in the lecture be sure to ask about it.

3. Always answer the review questions at the end of the chapter. The textbook will read differently than the way the professor talks. Test questions will come from the text as well as the lecture and discussion material.

4. Use the class discussions! What you see as important or even common sense the next person will ignore. You must use your classmates to help you study and you in turn will help them study too.

5. It can’t be helped. This is a science course and some facts will just have to be memorized.

6. If you look over your notes every day, even if you just skim them for 30 minutes, you will be able to stay on top of the course. You must keep up with the material. Look at the chapters and decide how long it will take you to read them. Then compare the lecture notes with the material in the chapters.

MICROBIOLOGY UNKNOWN RULES:
FOR ALL MICROBIOLOGY LABORATORY CLASSES

1. You cannot share unknowns. Everyone must have his or her own unknown.

2. If you are absent when unknowns are distributed, have a laboratory partner get one for you.

3. If you are absent and you cannot transfer your unknown, please ask a classmate to transfer it for you.

4. You must be present to do the physiological characteristics of your unknown. However, if you are not present you will only have one week to do the physiological characteristics of your unknown. If the work on your unknown is not completed by that time, you will receive a grade of 33% for that portion of the laboratory.

5. *THERE ARE NO EXCEPTIONS TO THESE RULES.*
Addenda

Laboratory Attendance and Exam Policy for Lecture and Lab:

NO MAKE-UP EXAMINATION IS GIVEN. Students missing an exam will have the comprehensive exam count twice. A student missing a second exam will receive a zero for that exam.

No one will be allowed to start the test once the first has been turned in.

For every lab missed your grade will drop 10%. If you are tardy you will miss the directions and not be allowed to participate in lab as well as missing the quiz. This will also drop your grade by 10%. No Exceptions.

No student missing more than three laboratory classes will receive credit for this course. If a student is constantly absent due to personal obligations and/or stops attending class, PLEASE OFFICIALLY DROP THE COURSE or else the student will receive an "E" grade.

Class Assignments: It is the student’s responsibility to make sure that all assignments are turned in on time. Late assignments will receive reduced grades due to tardiness. Grades will be decreased 10% for each day late. All lab books must be new and the pages unmarked to receive credit. No credit is given for photocopied pages of lab assignments.

Smoking Policy: As of January 1, 1992, Bergen Community College facilities are smoke free. Smoking is not allowed in any building on campus.

Eating & Drinking: Eating and drink in the classrooms, lecture halls, laboratories, and passageways is forbidden. Eating and drinking are permitted in the cafeteria and vending areas only.

Faculty Absence: A daily listing of cancelled classes will appear in the glass case located outside the Evening Office (L-113). Another such listing will appear in the glass case adjacent to the Hotel / Restaurant bulletin board in Ender Hall. Students can consult these cases before going to class. If students find a class cancelled which has not been listed, they should report this to the Evening Office or the Divisional Dean's office, A325.

Laboratory Safety: Students must wear protective eye wear, vinyl gloves and laboratory coats. No outside coats, bookbags, purses, books, pens/pencils, food or drink will be allowed in the lab. Each student must purchase a lock to keep said items out of the lab. Safety glasses and gloves will be provided so the lab coats are the responsibility of the student.

No handheld devices are allowed at student work benches.
COLLEGE POLICIES

STANDARDS OF CONDUCT:

Upon accepting admittance to BCC, all students acknowledge that while participating in activities on campus, they are governed by College rules and regulations, as well as those set be the Student Senate.

Each student is expected to exercise discretion, and act within the limits of decorum and propriety at all times and in all places. Students are accountable for behavior contributing to

1) danger to the safety and well-being of themselves or others;
2) a breach of College rules and regulations (see Student Handbook);
3) a disruption of the College’s regularly planned programs and activities, including classroom and laboratory sessions.

Any student who exhibits disruptive, threatening, or inappropriate behaviors will be asked to leave the classroom or lab immediately, and report to the Vice President of Student Services.

NOISE AND SOUND:

BCC values an environment conducive to learning. It is expected that students respect and support that concept. Noise created by electronic devices cannot and will not be tolerated. Students who disturb the operation of the College, including the classroom and laboratory, may be subject to disciplinary action.

Please turn off the sound to all electronic devices before entering any classroom or lab. **Also, no electronic devices will be allowed at the student work benches to prevent contamination.** You will be asked to leave, if any disruption occurs or if any handheld devices are found at the student work bench. Students will have to report to the Vice President of Student Services and cleared by the Vice President before they are allowed to return to class.

I have carefully read and fully understand the above and the material in the syllabus.

Print Name:____________________________________________________________ Date:_____________

Signature:_____________________________________________________________
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