



BIOL-2420-102CL (9980) Microbiology Non-Science

Summer 2024, 06/03/2024-08/09/2024

Lecture: Monday, Tuesday, Wednesday, Thursday 12:00PM - 2:15AM, Steam Bldg. #22, Room 342

Lab: Thursday 12:00PM - 2:15PM, Steam Bldg. #22, Room 321

Instructor Information: James Mubiru, jmubiru@com.edu, phone number 409-933-8245

Student hours and location: Mon, Tues, Wed, and Thursday 11:00AM-12:00PM, 3:00PM-4:00PM Steam building, room S.325-20

Required Textbook/Materials:

Tortora, G.J., Funke, B.R. & Case, C.L., 2016. Microbiology: An Introduction, 13th edition, Boston, MA; Pearson Education, Inc. Publisher. ISBN-13: 9780134605180. This book is purchased at the time of registration as an e-book that you will gain access to once you are in D2L.

Mastering Microbiology: On-line component for the course. This is purchased at the time of registration.

Lab Manual: Alderson, G.D., 2015. Microbiology Experiments & Lab Techniques, 14th edition. Southlake, TX; Fountainhead Press Publisher. ISBN-13: 9781598718782

LAB COAT- made of polyester, cotton, or blend (No disposable plastic coats)

Safety-glasses are recommended purchase if you do not want to use common ones.

Sharpie and Coloring pencils to be used in the lab. **Calculator with log function**

Scantrons

Six 888-E Scantrons

Course Description:

This course covers basic microbiology and immunology and is primarily directed at pre-nursing, pre-allied health, and non-science majors. It provides an introduction to historical concepts of the nature of microorganisms, microbial diversity, the importance of microorganisms and acellular agents in the biosphere, and their roles in human and animal diseases. Major topics include bacterial structure as well as growth, physiology, genetics, and biochemistry of microorganisms. Emphasis is on medical microbiology, infectious diseases, and public health this course covers basics of culture and identification of bacteria and microbial ecology.

Course requirements: (including description of any special projects or assignments)

First Exam, Midterm Exam & Final Exam

These exams will be taken face-to face and will consist of multiple-choice, fill-in-the-blank, matching, true-false, essay and identification.

1. The first exam will be taken in week 3 and will cover chapters 1, 3, 4, 5, 27 and 28.
2. The mid-term exam will be taken in week 6 and will cover the next set of chapters (6, 7, 8, 9, 10,12, and 13).
3. The Final exam will be taken in week 10. It is not cumulative and will only cover the last part of the course (chapters 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, and 26).

Lecture Quizzes

You will have eight on-line quizzes that are found in D2L under the Quiz tab. Each quiz consists of 20 questions, and you will have 30 minutes to answer these questions. These tests open on Thursday each week during the session and close the following Sunday. If you experience technical difficulty, please contact me. If I can verify the technical difficulty on my end, I can reset exams if the due date has not passed. I advise you to try and take the quiz earlier in the week vs. the last hour on Sunday!

Mastering Homework Assignments

With the required Mastering Component, you will need to complete ten (10) Mastering Homework Assignments during the course. Please check the schedule for the due dates.

In-class activities (50 points)

You will have in-class activities to cover material that reinforces the course material or is of clinical importance. The activities below will be done in class:

1. Cell wall craft (8 points)
2. Aerobic respiration craft (8 points)
3. Antibody craft (8 points)
4. Virus craft model (8 points)
5. **“In the news”** disease classroom discussion (8 points)
6. Article summary (10 points)

Pre-lab Quizzes (11 quizzes, total 60 points)

I will expect for you to be preparing for the upcoming labs outside of class according to the schedule. Please refer to D2L for folders containing material to help you with your preparation of upcoming labs according to the schedule. To make sure you understand the BACKGROUND material and the PROCEDURES in the upcoming lab, you will need to take an on-line quiz to demonstrate that you are ready to enter the lab. If you score below 70%, then I will allow you to enter the lab if you have written by hand the procedures that will be covered in that laboratory exercise. Failure to come to class with a hand-written procedure means you will not be able to perform the lab and therefore forfeit the points associated with the laboratory exercises. If you score 70% or above, you do not need to write out the procedure and use your lab manual accordingly. This is a similar policy to how the laboratory exercises are conducted in nursing school. It is my hope that this will help prepare you for this type of laboratory training that most of you will need to have.

Lab Assignments (11 lab reports, total 100 points)

For each laboratory experiment, there are questions that are associated with carrying out the procedures and analyzing the results. You will be responsible for turning in these questions at the end of every exercise.

1. **If a student does not follow proper laboratory safety protocol during the completion of the experiment, or does not clean the microscope, he/she will be penalized 2 points on the laboratory assignment.**
2. **Lab exercises sent through e-mail will not be accepted.**

Lab Practicals

There will be 2 laboratory practicals which will consist of a Power Point presentation and a written section.

Unknown Bacteria Project

Students will be expected to use their knowledge and experience in the lab to determine the identification of two unknown bacteria samples. The rubric for this project is as below.

| | | |
|---|--|-----------|
| 1 | Completion of the dichotomous key | 10 points |
| 2 | Completion of bacteria characteristic chart | 10 points |
| 3 | Determination of bacteria shape | 5 points |
| 4 | Determination of Gram stain results | 5 points |
| 5 | Correctly carrying out selective media | 5 points |
| 6 | Correct identification of bacteria species (two names) | 5 points |

Bonus Points (Extra points)

There will be opportunities for you to earn bonus points. Bonus points are not part of the course requirements so any bonus points earned will help your grade and any bonus points lost will not affect your grade negatively. **In order to earn bonus points, attendance is mandatory!**

The extra credit opportunities are as below:

❖ New cures for sickle cell disease (10 points added to the first exam)

Recently the FDA approved two gene therapies to treat patients with sickle cell disease. Students should a one-page single-spaced research paper on these two therapies. The references should be put on a separate page and the questions on another page (**total 3 pages**). Students should also answer the questions below:

Questions about the recently FDA-approved gene therapies for sickle cell disease

1. What is the name of the protein that carries oxygen in the body?
2. What cell in body contains hemoglobin?
3. What is the shape of a normal red blood cell?
4. What is the shape of red blood cells found in sickle cell disease patients?
5. What age groups were the treatment approved for?
6. What is CRISPR?
7. What is the main symptom experienced by sickle cell disease patients?
8. How effective are the new treatments?
9. What are some drawbacks with these treatments.
10. Could treatments for other genetic diseases be developed using the knowledge and experience gained from these two treatments?

Grading Rubric.

| Page requirement | Three pages written. (3 points) | Two pages written. (2 points) | One page written (1 point) |
|---------------------------|--|---|-------------------------------|
| Work cited | Material used in the paper were cited. (2 points) | No works cited. (0 points) | |
| Questions answered | 10 questions answered. (5 points) | 10 questions were not answered. (0 points) | |

❖ **Respiratory syncytial virus vaccine extra points (10 points added on the midterm exam)**

This research project covers the recently approved respiratory syncytial virus (RSV) vaccines. Students should do search on the recent literature concerning the recently approved respiratory syncytial virus (RSV) vaccines and write two page single-space paper on these vaccines. On a separate sheet of paper students should answer the questions below. **(3 pages required)**

1. What are the names of the recently FDA-approved respiratory syncytial virus (RSV)vaccines?
2. What are the names of the companies that makes these RSV vaccines?
3. What age group were these vaccines approved for?
4. What is the morbidity and mortality of RSV in people 65 years of age and older?
5. Why were these vaccines approved for this age group?
6. It has been shown that the circulation of respiratory syncytial virus (RSV) in the community is seasonal. In what season does RSV usually circulate?
7. What are some of the symptoms of RSV?
8. What are most frequently observed adverse events (side effects) associated with these new RSV vaccines?
9. Some participants in RSV trails developed Guillain-Barre syndrome. What is Guillain-Barre syndrome?
10. One of the new RSV vaccines is adjuvanted. What does the term adjuvant mean?
11. Define phenomenon termed vaccine-associated enhanced respiratory disease.

Grading Rubric.

| Page requirement | Three pages written. (3 points) | Two pages written. (2 points) | One page written (1 point) |
|---------------------------|--|---|---------------------------------------|
| Work cited | Material used in the paper were cited. (2 points) | No works cited. (0 points) | |
| Questions answered | 10 questions answered. (5 points) | 10 questions were not answered. (0 points) | |

Sickle cell club activities extra points (added to the final, must be actively involved in club activities)

These points will be awarded to students who do activities related to sickle cell disease. Currently we do not know what activities will be available.

Determination of Course Grade/Detailed Grading Formula: (methods of evaluation to be employed to include a variety of means to evaluate student performance)

| Course Assessment | Total Points | Percentage of Course |
|------------------------------------|--------------|----------------------|
| LECTURE PORTION | 650 | 65.0% |
| Lecture Quizzes (8) | 160 | 16.0% |
| Pearson Homework (10) | 140 | 14.0% |
| In-class activities (6 activities) | 50 | 5.0% |
| First Exam | 50 | 5.0% |
| Mid-term Exam | 120 | 12% |
| Final Exam | 130 | 13% |
| LABORATORY PORTION | 350 | 35.0% |
| Pre-Lab Quizzes (11) | 60 | 6.0% |
| Lab Assignments (11) | 100 | 10.0% |
| Unknown Bacteria Project | 40 | 4.0% |
| Lab Practical # 1 | 75 | 7.5% |
| Lab Practical # 2 | 75 | 7.5% |
| TOTAL POINTS | 1000 | 100% |

Grading Scale

- A** A Sum of the points earned for course assessments that equals between 900 and 1000 points
- B** A Sum of the points earned for course assessments that equals between 800 and 899 points
- C** A Sum of the points earned for course assessments that equals between 700 and 799 points
- D** A Sum of the points earned for course assessments that equals between 600 and 699 points
- F** A Sum of the points earned for course assessments that equals below 600 points.
- I** An incomplete may be assigned at the discretion of the instructor in accordance with college policy.
- W** A withdrawal may be assigned in accordance with college policy.

Lab Science Policy

This course consists of both a lecture and laboratory grade component. Students must earn a 70% or better in the laboratory component to successfully pass the course. Earning less than 70% in the laboratory component will result in an F for the course regardless of the lecture grade. Passing the laboratory component and failing the lecture component will not guarantee a passing grade for the course. Deviations from this policy will be at the sole discretion of the instructor.

Late Work, Make-Up, and Extra-Credit Policy:

- For online tests/exams, if you experience technical difficulty, please contact me. If I can verify the technical difficulty on my end, I can reset exams if the due date has not passed.
- I do not reset exams for students who just want to improve their grades.
- Issues with a particular grade should be brought to my attention as soon as possible. **After two weeks have passed since the due date, I will not change the grade or reset the test.**

4. If a student has a sickness or a family emergency, I will reset the exam/test after the student brings suitable documentation. However, if two weeks have passed, I will not accept the documentation.

Attendance Policy:

1. Being called in at work is not a valid excuse in this course.
2. A student is required to come to lab to complete the face-to-face laboratory exercises required in the laboratory component of this course. **Absences in three required lab meetings may result in an "F" for the course grade unless there is a documented excuse approved by the instructor (e.g. illness or death in the family). If you miss more than 3 labs even if you have a documented excuse, you will get and "F" for the course.**
3. A student can only miss one lab.
4. Attendance is taken at every class meeting and verified at the end of class. Do not leave class early!
5. If a student accumulates 3 absences, I MUST submit his/her name to the Early Alert System and extra credit will not be added to the student's grade.

Communicating with your instructor: ALL electronic communication with the instructor must be through your COM email. Due to FERPA restrictions, faculty cannot share any information about performance in the class through other electronic means. (Faculty may add additional statement requiring monitoring and communication expectations via D2L or other LMS)

| Student Learner Outcome | Maps to Core Objective | Assessed via this Assignment |
|-------------------------|------------------------|-----------------------------------|
| 1. SLO 10 | | Exercise 3 (Intro to microscopes) |
| 2. SLO 11 | | Exercise 5 (advanced microscopy) |
| 3. SLO 12 | | Exercise 6 (Transfer technique) |

Academic Dishonesty:

The practice of taking someone else's work or ideas and passing them off as one's own. Plagiarism is a very serious offense. Plagiarism includes paraphrasing someone else's words without giving proper citation, copying directly from a website and pasting it into your paper, using someone else's words without quotation marks. Any assignment containing any plagiarized material will receive a grade of zero and the student will be referred to the Office of Student Conduct for the appropriate discipline action. In addition, I am providing you with an internet link to a video on Plagiarism. I would strongly urge you to look this over early in the course.

https://video.search.yahoo.com/search/video;_ylt=Awr9CJ2Y5apgK1AA2WJXNyoA;_ylu=Y29sbwNncTEEcG9zAzEEdnRpZAMEc2VjA3BpdnM-?p=Plagiarism&fr2=piv-web&fr=yfp-t-s#id=1&vid=7cd373337514bc2e27ced094c7fc08e6&action=view

Student Concerns: If you have any questions or concerns about any aspect of this course, please contact me using the contact information previously provided. If, after discussing your concern with me, you continue to have questions, please contact Sheena Abernathy, Chair of the Science Department, at 409-933-8330 or by email: sabernathy@com.edu

Course outline: (include calendar with lecture topics, due dates)

| Week | Chapters/labs/Exams | | D2L Assignments |
|---------------------|---------------------|---|---|
| Week 1 6/3-6/9 | Mon | Chapter 1 | 1. Pearson Mastering HW1(6/9/24) 2. Lecture quiz 1 (6/9/24) 3. Pre-lab 1 due on (6/6/24) 4. Cell wall craft (6/9/24) 5. In the news assignment (8/4/24) 6. Article summary (6/16/24) 7. Sickle cell cure extr credit (6/7/24) |
| | Tues | Chapter 3 | |
| | Wed | Chapter 4 | |
| | Thurs | 1. Lab safety, Ex. 3: Intro to microscopes 2. Ex. 5: Advanced microscopy, and wet mount of protists | |
| Week 2 6/10-6/16 | Mon | Chapter 5 | 1. Pearson Mastering HW2 (6/16/24) 2. Respiration craft (6/10/24) 3. Lecture quiz 2 (6/16/24) 4. Prelab 2 (6/13/24) |
| | Tues | Chapter 27 | |
| | Wed | Chapter 28 | |
| | Thurs | 1. Ex. 1 Contamination lab 2. Ex. 6 Transfer technique 3. Ex. 18 Medical Asepsis | |
| 3 Week 6/17-6/23 | Mon | Exam 1 (face-to face) Chapter 6 | 1. Pearson Mastering HW3 (6/23/24) 2. Lecture quiz 3 (6/23/24) 3. Prelab 3 (6/20/24) |
| | Tues | Chapter 7 | |
| | Wed | Chapter 8 | |
| | Thurs | 1. Ex. 7: Streak plate technique 2. Ex. 8: Counting bacteria | |
| Week 4 6/24-6/30 | Mon | Chapter 9 | 1. Pearson Mastering HW4 (6/30/24) 2. Prelab 4 (6/27/24) 3. Prelab 7 (6/27/24) |
| | Tues | Chapter 10 | |
| | Wed | Chapter 12 | |
| | Thurs | Ex. 9: Simple stain, Ex. 13: Acid fast stain Ex. 12: Endospore stain | |
| Week 5 7/1-7/7 | Mon | Chapter 13 | 1. Pearson Mastering HW5 (7/7/24) 2. Lecture quiz 4 (7/7/24) 3. Prelab 5 (7/3/24) 4. Virus craft (7/7/24) 5. RSV vaccine extra credit (7/7/24) |
| | Tues | Chapter 14 | |
| | Wed | Chapter 15 | |
| | Thurs | Ex. 10: Gram stain with unknowns Ex. 11: Capsule stain | |
| Week 6 7/8-7/14 | Mon | Midterm (face-to-face) | 1. Pearson Mastering HW6 (7/14/24) 2. Lecture quiz 5 (7/14/24) 3. Antibody craft (7/14/24) |
| | Tues | Chapter 16 | |
| | Wed | Chapter 17 | |
| | Thurs | Lab practical-1 (face-to face) | |
| Week 7 7/15-7/21 | Mon | Chapter 18 | 1. Pearson Mastering HW7 (7/21/24) 2. Pearson Mastering HW8 (7/21/24) 3. Lecture quiz 6 ((7/21/24) 4. Prelab 7b (7/18/24) |
| | Tues | Chapter 19 | |
| | Wed | Chapter 20 | |
| | Thurs | 1. Ex.19: Control of microorganisms moist and dry heat 2. Ex.20: Control of microorganisms with ultraviolet light 3. Ex.21: Control of microorganisms with disinfectants 4. Ex. 22: Control of microorganisms with antibiotics | |
| Week 8 7/22-7/28 | Mon | Chapter 21 | 1. Pearson Mastering HW9 (7/28/24) 2. Lecture quiz 7 (7/28/24) 3. Prelab for week 8b (7/25/24) 4. Prelab Parasitology (7/25/24) |
| | Tues | Chapter 22 | |
| | Wed | Chapter 23 | |
| | Thurs | Ex. 27, 29 & 31: Pathogenic cocci, cultures of anaerobic bacteria and Parasitology | |

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|--------------------|-------|--|--|
| Week 9 7/29-8/4 | Mon | Chapter 24 | 1. Lecture quiz 8 (8/4/24) 2. Pearson Mastering HW10 (8/4/24) 3. Prelab 9b (8/1/24) 4. Prelab 9c (8/1/24) |
| | Tues | Chapter 25 | |
| | Wed | Chapter 26 | |
| | Thurs | Ex. 30: Enteric bacteria Ex. 33: Epidemiology Ex. 14: Bacterial conjugation | |
| Week 10 8/5-8/9 | Mon | Unknown bacteria project Dichotomous key due, bacteria characteristic table due, Gram stain, Culture samples on plates | |
| | Tues | Reading results of the unknown bacteria project | |
| | Wed | Final exam | |
| | Thurs | Lab practical-II (online) | |

Institutional Policies and Guidelines

Grade Appeal Process: Concerns about the accuracy of grades should first be discussed with the instructor. A request for a change of grade is a formal request and must be made within six months of the grade assignment. Directions for filing an appeal can be found in the student handbook https://www.com.edu/student-services/docs/Student_Handbook_2023-2024_v2.pdf. *An appeal will not be considered because of general dissatisfaction with a grade, penalty, or outcome of a course. Disagreement with the instructor’s professional judgment of the quality of the student’s work and performance is also not an admissible basis for a grade appeal.*

Academic Success & Support Services: College of the Mainland is committed to providing students the necessary support and tools for success in their college careers. Support is offered through our Tutoring Services, Library, Counseling, and through Student Services. Please discuss any concerns with your faculty or an advisor.

ADA Statement: Any student with a documented disability needing academic accommodations is requested to contact:

Kimberly Lachney, Student Accessibility Services Coordinator

Phone: 409-933-8919

Email: AccessibilityServices@com.edu

Location: COM Doyle Family Administration Building, Student Success Center

Textbook Purchasing Statement: A student attending College of the Mainland is not under any obligation to purchase a textbook from the college-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

Withdrawal Policy: Students may withdraw from this course for any reason prior to the last eligible day for a “W” grade. Before withdrawing students should speak with the instructor and consult an advisor. Students are permitted to withdraw only six times during their college career by state law. The last date to withdraw from the 1st 5-week session is July 1. The last date to withdraw from the 10-week session is July 30. The last date to withdraw for the 2nd 5-week session is August 2.

FN Grading: The FN grade is issued in cases of *failure due to a lack of attendance*, as determined by the instructor. The FN grade may be issued for cases in which the student ceases or fails to attend class, submit assignments, or participate in required capacities, and for which the student has failed to withdraw. The issuing of the FN grade is at the discretion of the instructor. The last date of attendance should be documented for submission of an FN grade.

Early Alert Program: The Student Success Center at College of the Mainland has implemented an Early Alert Program because student success and retention are very important to us. I have been asked to refer students to the program throughout the semester if they are having difficulty completing assignments or have poor attendance. If you are referred to the Early Alert Program you will be contacted by someone in the Student Success Center who will schedule a meeting with you to see what assistance they can offer in order for you to meet your academic goals.

Resources to Help with Stress:

If you are experiencing stress or anxiety about your daily living needs including food, housing or just feel you could benefit from free resources to help you through a difficult time, please click here <https://www.com.edu/community-resource-center/>. College of the Mainland has partnered with free community resources to help you stay on track with your schoolwork, by addressing life issues that get in the way of doing your best in school. All services are private and confidential. You may also contact the Dean of Students office at deanofstudents@com.edu or communityresources@com.edu.

Nondiscrimination Statement:

The College District prohibits discrimination, including harassment, against any individual on the basis of race, color, religion, national origin, age, veteran status, disability, sex, sexual orientation, gender (including gender identity and gender expression), or any other basis prohibited by law. Retaliation against anyone involved in the complaint process is a violation of College District policy.