



BIOL 2420 Microbiology (BIOL 2420.088)

Course Syllabus: Spring 2024

"Northeast Texas Community College exists to provide personal, dynamic learning experiences empowering students to succeed."



Mary Hearron, Ed.D.

Professor of Biology and Chemistry, Emeritus

Office: Online/Teams/Email

Email: mhearron@ntcc.edu

The information contained in this syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Catalog Course Description: This course covers basic microbiology and immunology. It introduces 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.

Purpose of the Course: This is an **ONLINE** course in microbiology for both lecture and lab. All lecture materials can be accessed through the NTCC Blackboard Learning Management System from any location in which the student has internet access. The lab component of the course requires the purchase of the eScience lab kit. If you are remote, you may purchase a voucher for the lab kit and go to the eScience lab website to redeem the voucher and have the kit delivered directly to your home. If you are a local student, you may be able to pick up a lab kit directly from the college store. All lab activities can then be completed at your location without coming to campus. However, both the mid-term and final exams (lecture and lab practicals) are required to be taken in an approved testing center either on the NTCC campus or other permissible location.

This course is intended for those students interested in pursuing a degree in any one of the health sciences professions including but not limited to: nursing, medical laboratory technology, dental hygiene, or medical assisting. Though there are no official prerequisites for this non-majors' course listed in the Texas Academic Course Guide Manual, there is an expectation that students have had previous exposure to fundamental biological principles preferably gained from a college course in anatomy and physiology or general biology. Microbiology traditionally involves the study of organisms/viral particles too small to be seen with the naked eye. This includes bacteria, viruses, helminth worms, fungi and protozoans. There are various applied sub-disciplines in microbiology including food, medical, and agricultural. This course will focus primarily on medical microbiology. An understanding of basic chemical principles, cell structure and function and human organ systems is beneficial as you begin your study of microbiology.

Inclusive Access: The college has negotiated with the publisher to obtain a discounted price for your lecture course materials. Your eBook and Connect Access Code are included with your tuition and will be available through Blackboard on the first class day (use the link found on the Bb course homepage). The materials are required for your class and essential in your success. If you also

determine that you would like a print copy of your text in addition to your inclusive access loose-leaf copies will be available in the College Store at a discounted price. You may opt out of purchasing your materials from the College Store through the Census Date for the course. If you choose to opt out you will be responsible for purchasing your Connect Access Code from another vendor. You will receive a refund for the Inclusive Access if you opt out.

The required lab kit is a separate purchase available from the NTCC College Store.

Required Textbook/Lab Kit:

- Cowan, 2022, Microbiology Fundamentals: A Clinical Approach, 4th Edition with Connect Publisher: McGraw Hill; ISBN-978-1-260-70243-9
- eScience Microbiology Lab Kit #6039 info@esciencelabs.com © eScience Labs, LLC 2019

Recommended Reading(s): Appropriate chapters in textbook as assigned

Minimum Technology Requirements:

- Laptop or computer with webcam
- Access to high speed daily internet
- Microsoft Office 365 (available as a free download for all NTCC students)

Required Computer Literacy Skills:

- Ability to use a web browser to access NTCC Blackboard System for course information, eBook and Connect assignments and Respondus Lockdown Browser for test monitoring as required.
- Ability to access NTCC student email system and communicate professionally and competently with instructor.
- Ability to download, create and complete Word documents, save on your computer and upload into Bb assignment links.

College Student Learning Outcomes:

Critical Thinking Skills

CT.1

Students will demonstrate the ability to 1) analyze complex issues, 2) synthesize information, and 3) evaluate the logic, validity, and relevance of data.

Communication Skills

CS.1

Students will effectively develop, interpret and express ideas through written communication.

Empirical and Quantitative Skills

EQS.1

Students will manipulate numerical data or observable facts by organizing and converting relevant information into mathematical or empirical form.

EQS.2

Students will analyze numerical data or observable facts by processing information with correct calculations, explicit notations, and appropriate technology.

Team Work

TW2.

Students will work with others to support and accomplish a shared goal.

COURSE Student Learning Outcomes:

1. Describe distinctive characteristics and diverse growth requirements of prokaryotic organisms compared to eukaryotic organisms.
2. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
3. Distinguish between mechanisms of physical and chemical agents to control microbial populations.
4. Explain the unique characteristics of bacterial metabolism and bacterial genetics.
5. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
6. Compare characteristics and replication of acellular infectious agents (viruses and prions) with characteristics and reproduction of cellular infectious agents (prokaryotes and eukaryotes).
7. Describe functions of host defenses and the immune system in combating infectious diseases and explain how immunizations protect against specific diseases.
8. Explain transmission and virulence mechanisms of cellular and acellular infectious agents.
9. Use and comply with laboratory safety rules, procedures, and universal precautions.
10. Perform basic microbiology procedures including proficient use of light microscope, staining techniques, and aseptic techniques for transfer, isolation, quantification, and observation of bacteria.
11. Use different types of bacterial culture media and biochemical tests to grow, isolate, and identify microorganisms.
12. Demonstrate making a wet mount and basic identification protocols based on microscopic morphology of some common fungi and parasites.

Lecture Readings, Connect Assignments and Discussions:

- Week 1- Chapter 1 & 3
- Week 2- Chapter 4
- Week 3- Chapter 5
- Week 4- **Test 1 (Chps. 1, 3-5)**
- Week 5- Chapter 7
- Week 6- Chapter 8
- Week 7- Chapters 9 & 11; **Test 2 (Chps. 7- 9, 11)**
- Week 8- **MIDTERM (Lecture and Lab Practical at an approved testing center)**
- Week 9- Chapter 12 & 13
- Week 10- Chapter 16
- Week 11- Chapter 17; **Test 3 (Chps. 12-13, 16-17)**
- Week 12- Chapter 18
- Week 13- Chapter 19
- Week 14- Chapter 20
- Week 15- Chapter 21; **Test 4 (Chps. 18-21)**
- Week 16- **FINAL EXAM (Lecture and Lab Practical at an approved testing center)**

Evaluation/Grading Policy:

Lecture Average 70% of final course grade

The “lecture” component of this course will consist of online homework/quizzes through McGraw-Hill Connect, Unit discussions, unit assessments and mid-term and final examinations with the following weight in calculating your final average:

- 10% online Connect homework, and all quizzes and NCLEX quizzes
- 10% Unit discussions
- 20% Unit Assessments 1-4 (taken in Respondus Lockdown Browser)
- 15% Midterm Exam (taken at an approved proctored location)
- 15% Final Exam (taken at an approved proctored location)

Final Grades will be determined as follows:

- 90.0 --- 100 = A
- 80.0 --- 89.9 = B
- 70.0 --- 79.9 = C
- 60.0 --- 69.9 = D
- 59.9 and <= F

Please note that there is no “extra credit” assigned/offered for any individual student in the course.

Learning Activities

Assignments and Quizzes are accessed in Bb using **McGraw-Hill Connect**. Each assignment or quiz will be due at a specific time in the semester related to the lecture schedule. See the printable calendar to note specific due dates.

What is McGraw-Hill Connect?

The McGraw-Hill Connect provides you with access to your eBook. Additionally, within each Connect Folder in Blackboard you will see a link to three different activities: 1) SmartBook, 2) Chapter Assignment, and 3) NCLEX Quiz. **Each of these types of activities are auto-graded in the Connect system and those grades will be automatically uploaded into the Blackboard grade book.** If you feel that there is a grading error within Connect, do not hesitate to contact me with that information. If you have any question about a Connect assignment, do not hesitate to contact me for an explanation. There is also a link within Connect to report or challenge an incorrect answer.

- 1) SmartBook assignments are beneficial to your understanding of the material. **These are not figured into your course grade**; however, students have said that doing the SmartBook exercises improved their grades. This guided reading helps identify areas that you are having trouble understanding and provides you with some “tutoring” in those areas. I have set the SmartBook to take average of 30-45 minutes, however, you can spend as much time on these reading activities as you need.
- 2) Homework assignments **are required and figured into the course grade**. These can be done 2 times before the due date. Five percent will be deducted for the 2nd try. There is no time limit so it is advisable to start early and work on this all during the week. Use of the eBook and hints are available with no deductions. Feedback will be shown after submitting each attempt. After the first attempt, you will see what questions you got correct or incorrect. After the 2nd attempt, a more detailed feedback is given. Printing is allowed on homework assignment questions.

Study attempts: After the due date, these homework assignments will be available for practice without changing your grade. Assignments are automatically submitted on the due date. If you do not complete the assignment before that time, a grade of zero will automatically be recorded in the gradebook. If you open the assignment after the due date as a study attempt, you cannot receive an extension on the work.

- 3) Chapter Quizzes and NCLEX Quizzes are **required and figured into the course grade**. Chapter Quizzes are usually 25 questions with a time limit of 30 minutes. Please use these quizzes to determine whether you have a true understanding of the material. Chapter Quizzes can be taken 2 times before the due date. If you take the 2nd attempt at the quiz, you will “start over” and may be getting new questions. It is to your advantage to see as many question types as possible. Five percent will be deducted for the 2nd try but I have set the quizzes and the homework assignments to take the highest grade so it is to your advantage to correct your work and review the questions. The Chapter Quizzes automatically submit on the due date as does the homework. After the due date, you can open the quiz as a study attempt. The NCLEX quizzes are usually only 10-15 questions. These are important examples of the types of questions you will see on the NCLEX exam. NCLEX quizzes are set with the same policy as Chapter Quizzes and homework assignments.

What are Discussion Board Postings?

This course is divided into 4 Units of study. Each unit will pose a specific discussion question to which you must respond. A 300- word response to the discussion question will be required.

Additionally, you should reply to at least 2 other students with a minimum of a 50-word response. The discussion postings will allow you to interact with other students in the course to exchange ideas and/or opinions. The instructor will also be interacting with you through the discussion board. Grades will be determined based on the following criteria: postings are written in your own words; the minimum required length is met and responses to at least 2 other students are posted. Each appropriate posting is worth 70 points and each response to other students are worth 15 points.

What are Unit Assessments?

There are 4 Unit assessments/tests. Each assessment/test will be taken through Respondus Lock- down Browser and will consist of multiple choice and short answer/discussion questions. Each assessment is graded based on the number of multiple-choice questions and points awarded for short answer or discussion questions. The number of points per question will be represented in each assessment. The unit assessments are intended to prepare you for the mid-term exam and/or the final exam. Read the information in the “Start Here” folder to familiarize yourself with the process for downloading the browser.

Mid-term and Final Exams and Lab Practicals

The mid-term and final exams and lab practicals are proctored exams. You MUST schedule a time at an approved testing center to take these exams. There are NO EXCEPTIONS to this requirement. Refer to the posted calendar in the “Start Here” folder for appropriate dates. The mid-term, final and lab practicals are multiple choice and short answer. Each exam and the practicals are graded based on the number of questions and the possible points awarded. The number of points per question will be represented in each exam. If you are in the NTCC service area you must take the midterm and final exams at the NTCC testing center. If you are out of the NTCC service area, you must make arrangements in your local college testing center. Be sure to contact me with the contact information for your college.

Lab Average 30% of final course grade

The “lab” component of this course will consist of online and hands-on laboratory activities through eScience Lab Kit for Microbiology:

15% eScience Kit Online and hands-on Lab Reports

15% Lab Practicals (mid-term and final taken at the proctored testing location).

The labs within this course are important learning activities to help you master many of the learning outcomes in the course. Lab Workbooks should have all answers written in complete sentences in your own words describing work that you have completed to receive credit. Lab Reports are graded based on documented evidence of completion of the lab exercise (photos included in your lab report and your signature evident) and successful answering of questions presented. **Photo and signature documentation are worth from 25 to 50% of the lab exercise grade. All other graded questions and data charts are worth 50 to 75% of the lab exercise grade.** Each lab workbook indicates the points to be awarded upon completion. **Lab Reports that do not include all photos or that show evidence of being copied from any web site or are identical with any other submitted reports will be given a grade of zero.** It is important for you to know that I am completely aware of the fact that there are websites available that allow students to copy the work of others. These are not reputable and should not be utilized. They do not supply correct answers in many cases. I check these sites and compare your work to the answers I find there. When you complete each lab simply answer the questions based on your work and in your own words. You would never attempt to copy another person’s work when you are in your future profession and so do not attempt to do so now. Lab reports will generally be graded within a week of submission and feedback on your techniques or results will be included.

The eScience Lab Kit contains almost all of the materials that you will need. There are a few items that you should be prepared to supply to complete some labs. These include: access to a microwave oven or hot water bath; isopropyl (rubbing alcohol); soil sample; local water samples; an apple, a banana; disposable plastic pan. **Please be sure to review all of the materials in your lab kit and check them off with the list of the content that is included to be sure you have all materials. You should contact eScience if there are any missing components of your kit within the first week of obtaining your kit and eScience will replace them.**

Additional Information:

The Blackboard gradebook will be used to record all of your graded work. You will see a category named “CURRENT GRADE”. This number represents your current average based on the work that you have submitted at that point in the semester. **Any grades that have not been submitted, will not be averaged into the current grade unless a score of “0” has been entered. The current grade is fluent (a running total up to that point) and can change daily based on the work that you submit.** If you have any questions about your current grade at any point, you should certainly contact me with your question. A mid-term grade will be submitted to the Academic Success Team based on your Current Grade at that point.

The last day to drop the course with a grade of W is **Thursday, April 18, 2024**. If circumstances require you to withdraw from this course, you must do so by that date. It is the **student’s responsibility** to initiate the withdrawal with the registrar’s office. **Failure to officially withdraw will result in your receiving a grade of F.**

Student Responsibilities/Expectations:

Northeast Texas Community College is a “community of scholars”. Please remember that you and all of the students in this class are pursuing very important goals in your lives. As scholars, I expect every student to be courteous to other students and the instructor in all online experiences.

As your instructor, I will make a conscientious effort to provide you with a variety of teaching and learning formats to help you in your efforts to be successful in microbiology. I deeply care about your learning experience and your success in this course, however that ultimate success does depend largely on **YOU**. Your success can be maximized and your potential achieved by making the commitment to meet these online expectations:

1. Schedule and plan to complete all lecture and laboratory assignments and submit them when they are due. Be sure to print off the calendar to help you keep up with assignment due dates.
2. Be sure to do all of your own work. Collusion and plagiarism are acts of academic dishonesty.

For any questions that you may have concerning NTCC established student policies, please consult the Student Handbook found at

https://myeagle.ntcc.edu/ICS/icsfs/NTCC_Student_Handbook_2021-2022.pdf?target=eab4356b-3257-488c-9433-2c70b4acb5db

Communication: NTCC email is the official form of communication used by the college. Please check your NTCC email daily for any important announcements or communications from me. **I will post important announcements each week based on the topics that are to be studied. You should receive an email notification of these announcements as well. I will also post responses to your discussions as appropriate throughout the semester.** I encourage you to contact me with any questions that you have about the course through email. I will respond to your email within 24-36 hours but generally much sooner.

Discussion Board responses, emails, and all other correspondence among faculty and students enrolled in this class are expected to conform to the level of conduct that would be expected in a regular classroom. Students should feel free to express disagreement with the instructor and other students, but it must be done in a manner which is not verbally abusive, threatening, or harassing.

Communication among students is encouraged but must end if one of the party's requests that it be terminated. Students will not send unsolicited email espousing a cause, religion, or activity to other class participants and will not add other class participants to any listservs or other entity which distributes unwanted email or material.

Violation of these guidelines may result in disciplinary action against the offending student. This action can include termination of the student's participation in the class and a grade of "F". Please read the entire Netiquette guidelines document that is also posted in the START COURSE HERE folder.

NTCC Academic Honesty Statement:

"Students are expected to complete course work in an honest manner, using their intellects and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. NTCC upholds the highest standards of academic integrity. This course will follow the NTCC Academic Honesty policy stated in the Student Handbook." The college expects all students to engage in academic pursuits in a manner that is beyond reproach. Students are expected to maintain complete honesty and integrity in their academic pursuit.

Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. Refer to the student handbook for more information on this subject.

Statement Regarding the Use of Artificial Intelligence (AI) Technology:

Absent a clear statement from a course instructor, use of or consultation with generative AI shall be treated analogously to assistance from another person (collusion). Generative AI is a subset of AI that utilizes machine learning models to create new, original content, such as images, text, or music, based on patterns and structures learned from existing data (Cornell, Center for Teaching Innovation). Unauthorized use of generative AI tools to complete an assignment or exam is not permitted. Students should acknowledge the use of generative AI and default to disclosing such assistance when in doubt. Individual course instructors may set their own policies regulating the use of generative AI tools in their courses, including allowing or disallowing some or all uses of such tools. Students who are unsure of policies regarding generative AI tools are encouraged to ask their instructors for clarification. **(Adapted from the Stanford University Office of Community Standards-- accessed August 31, 2023)**

ADA Statement:

It is the policy of NTCC to provide reasonable accommodations for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to arrange an appointment with a College counselor to obtain a Request for Accommodations form. For more information, please refer to the NTCC Student Handbook.

Family Educational Rights and Privacy Act (FERPA):

The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children's educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered "eligible students." In essence, a parent has no legal right to obtain information concerning the child's college records without the written consent of the student. In compliance with FERPA, information classified as "directory information" may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student's name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.

Eagle Assist: At Northeast Texas Community College, we understand that students often need support that extends beyond the classroom. "Eagle Assist" is the place to start when looking for that type of assistance. Our support system is here to help you succeed in both your academic and personal growth. Services include mental health counseling, classroom accommodations, food pantry, hygiene closet, cook nook, financial literacy and emergency aid. Send a message to eagleassist@ntcc.edu for more information.