BIOL 2420 Microbiology (BIOL 2420.088)

Course Syllabus: Fall 2024

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

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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 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. All lecture materials can be accessed through the NTCC Blackboard Learning Management System from any location in which the student has internet access. However, both the mid- term and final exams (lecture and lab practicals) are required to be taken in an approved testing center. If you reside in the NTCC service area (Camp, Morris, Titus, Franklin, or Upshur Counties) you will come to the NTCC campus testing center. If you reside outside of NTCC's service area you should arrange with your closest local college testing center to complete the mid-term and final exams at that location.

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. 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.

Required Textbook/Lab Kit:

- Cowan, 2022, Microbiology Fundamentals: A Clinical Approach, 4th Edition with Connect Publisher: McGraw Hill; ISBN-978-1-260-70243-9

- Science Interactive Microbiology Lab Kit # **SI-10815-MB-01** © eScience Labs, LLC 2019

The lab component of the course requires the purchase of the Science Interactive lab kit. You should immediately purchase a voucher for the lab kit from the NTCC College Store. You may order the voucher code for the lab kit online through the college store website: https://www.ntccbookstore.com/home. Once you have your voucher, you will redeem it for the physical lab kit by going to the "Science Interactive Labs" Folder on your Blackboard Course Homepage. Once redeemed, the kit will be shipped to you from the distribution center. Redeem your Lab Kit Voucher Code as soon as possible to receive your kit by the first day of class. Below is the link to instructions to guide you through redeeming your lab kit code using Blackboard.
https://studenthelp.scienceinteractive.com/a/1237529-how-do-i-redeem-a-voucher-through-my-lms

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 day of class (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.

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.
- Ability to access NTCC student email system and communicate professionally and competently with instructor.
- Ability to create and complete Word documents, screen shots and photos, save on your computer and upload into Bb assignment links or Science Interactive 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 prokaryoticorganisms 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 controlmicrobial 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. Demonstrate proficient use of a compound light microscope.
11. Describe and prepare widely used stains and wet mounts and discuss their significance in identification of microorganisms.
12. Perform basic microbiology procedures using aseptic techniques for transfer, isolation and observation of commonly encountered, clinically significant bacteria.
13. Use different types of bacterial culture media to grow, isolate, and identify microorganisms.
14. Perform basic bacterial identification procedures using biochemical tests.
15. Estimate the number of microorganisms in a sample using methods such as direct counts, viable plate counts, or spectrophotometric measurements.
16. Demonstrate 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- **COMPREHENSIVE FINAL (Lecture & 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

20% Unit Assessments 1-4

20% Midterm Exam (taken at an approved proctored location)

20% 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 four different activities: 1) SmartBook, 2) Chapter Assignment, and 3) Chapter Quiz and 4) 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. If you prefer to just use the eBook to read each chapter, that is acceptable.
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. All homework is due on Sunday evening.
   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. Chapter quizzes are due on Tuesday evenings and NCLEX quizzes are due on Wednesday evenings throughout the semester.

What are Unit Assessments?

There are 4 Unit assessments/tests. Each assessment/test will be taken through Connect 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. You should consider these as formative evaluations intended to allow you to gauge what you have learned in each unit of study. Unit assessments will open on Thursday morning but are due on Saturday evening. You must complete these in one sitting.

Mid-term and Final Exams and Lab Practicals

The mid-term and final exams and lab practicals are summative evaluations and are proctored exams. You MUST complete these exams at an approved testing center. 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. Generally, the NTCC testing center does not require that you make an appointment. If you are out of the NTCC service area, you must schedule with your local college testing center. You should confirm with your college testing center to see if an appointment is required. Be sure to email me with the contact information for your college testing center.

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:

5% Identification of Bacterial Unknowns Connect Virtual Labs & Bacterial Unknown Quiz

10% Science Interactive Kit Laboratories (1-12)

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

There are 5 lab activities required to be completed before you can begin any of the laboratory experiments. They are: 1) Getting Started with SI Lab Kit; 2) Lab Safety; 3) Using the V-Scope; 4) Microbiology Lab Prep and 5) Lab Kit Inventory. These activities are all found in the START HERE folder on the homepage in Blackboard. Once they are completed, you will have access to the SI Lab Experiments 1 through 12. Please note that you will have one week to complete each of the 12 labs. Labs are due on Sunday evening along with Chapter Homework assignments. The labs within this course are important learning activities to help you master many of the learning outcomes in the course. To receive credit, all short-answer questions should be answered using complete sentences in your own words describing work that you have completed. Labs are graded based on documented evidence of completion of the lab exercise. Many labs require photos to be uploaded, data tables to be completed, and successful answering of questions presented. When photos are required as a component of a lab submission, work submitted without photos uploaded will receive an automatic zero. Completion of data tables is equally important. An icon for photo submission and data table completion is labeled "Data" and is located in the lower right corner of your lab experimentation page. Lab Reports 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. Lab reports will generally be graded within a week of submission and feedback on your techniques or results will be included.

The Science Interactive 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; household bleach, etc. **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 Science Interactive if there are any missing components of your kit within the first week of obtaining your kit and Science Interactive will replace them. Detailed instructions are included in the first lab activity you will complete.**

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 **Tuesday, November 19, 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 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.

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.