BIOL 2421 Microbiology
Course Syllabus: Spring 2014

“Northeast Texas Community College exists to provide responsible, exemplary learning opportunities.”

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<th>Office Hours</th>
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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 is a survey of microbiology emphasizing microbial morphology, metabolism, growth, and genetics. The classification of microorganisms with emphasis on biological principles and the medical significance to humans is also included. (Prerequisites: two college-level laboratory science courses)

Required Textbook(s):
  Publisher: McGraw-Hill Publishers
  ISBN Number: 978-0-07-337529-8
- Optional Atlas: Leboffe and Pierce, A Photographic Atlas for the Microbiology Laboratory; Morton Publishing.

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

Student Learning Outcomes:
1. List and describe at least five characteristics of life upon which the study of biology is based and understand the role of the following molecules in living systems: water, carbohydrates, lipids, proteins, and nucleic acids.
2. List and give the function of the basic characteristics shared by prokaryotic and eukaryotic cells. Describe how these cell types are different. Give examples of prokaryotic and eukaryotic cells and give evidence for the endosymbiotic theory.
3. Draw and describe the fluid mosaic model of the plasma membrane and compare and contrast the Gram + and Gram – cell wall.
4. Define metabolism, aerobic and anaerobic respiration, fermentation and the role of the ATP/ADP cycle in metabolic pathways.
5. Use the techniques, equipment and reagents involved in identifying bacteria including microscopic examination, staining and biochemical testing.
6. Define genetics and describe the role of DNA and RNA in replication, transcription and translation.
7. Understand the control of microbial growth using both physical techniques and chemical agents to destroy, remove, or reduce microbes in a given area.

8. Define normal flora and pathogen (strict and opportunistic). Understand the mechanisms by which organisms cause infection and/or disease.

9. Understand the major components of the first (skin and mucous membranes), second (phagocytosis, inflammation, complement, interferon and fever), and third (antigens, antibodies and lymphocytes) line of defense.

10. Identify Gram + and Gram – cocci, spirilli, and bacilli of medical importance.

11. Identify common eukaryotic infectious organisms and parasites.

12. Identify the basic characteristics of the viruses, the diseases they cause, and understand the lytic and lysogenic cycle of viral replication.

**Exemplary Educational Objectives:**

The objective of the study of a natural sciences component of a core curriculum is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the basis for building and testing theories.

The exemplary educational core objectives for natural sciences are:

3.1 to understand and apply method and appropriate technology to the study of natural sciences;
3.2 to recognize scientific and quantitative methods and the differences between those approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing;
3.3 to identify and recognize the differences among competing scientific theories;
3.4 to demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies;
3.5 to demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture.

**Lecture Readings and Discussions:**

- Week 1-Themes of Microbiology
- Week 2-Chemistry of Biology
- Week 3-Survey of Prokaryotic Cells and Microorganisms
- Week 4-Survey of Eukaryotic Cells and Microorganisms
- Week 5-Microbial Nutritional (Exam 1)
- Week 6-Microbial Growth
- Week 7-Physical and Chemical Control; Antimicrobials
- Week 8-Microbe-Human Interactions (Exam 2)
- Week 9-Gram-Positive and Gram-Negative Cocci and Gram-Positive Bacilli
- Week 10-Gram-Negative Bacilli and Miscellaneous Bacterial Agents
- Week 11-Fungi and Parasites of Medical Importance (Exam 3)
- Week 12-DNA Viruses
- Week 13-RNA Viruses
- Week 14-Host Defenses
- Week 15-Adaptive, Specific Immunity & Immunization (Exam 4)
Evaluation/Grading Policy:
40%  4 major examinations
20%  1 comprehensive final
10%  weekly evaluation and quizzes
10%  2 lab practicals
20%  unknown organisms research

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

Make-up Work: Any test missed, for any reason, must be cleared prior to the test date and are solely up to the discretion of the instructor. All assignments will be accepted only on the due date at the beginning of the period. There is no makeup for missed quizzes or labs.

The last day to drop the course with a grade of W is Thursday, April 10, 2014. 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.

Assignments and Exams: All dates are subject to change at the discretion of the instructor. Learning activities will include reading and evaluation scientific papers, learning basic Microbiological techniques, identifying unknown bacteria, answering questions in lecture and writing scientific papers.

Student Responsibilities/Expectations: Attendance in lab and lecture is necessary and expected. Individual assignments may be given out at various times in the course. They are expected to give an opportunity for individuality and creativity and add to an appreciation of course topics.

Other course (lab) requirements:
1. Lab coat or large shirt to protect clothing
2. Box of microscope slides
3. Sharpie marking pen
4. Plastic gloves/goggles
5. Roll of paper towels
6. 3 ringed binder for lab notebook
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."

Academic Ethics:
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 Catalog or 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.

Lecture Schedule and Exams:
Jan 13: Roll Call/ Syllabus Lab Safety
Jan 15: Lab Safety
Jan 20: No Class MLK Holiday
Jan 22: Chapter 1
Jan 27: Chapter 1

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Jan 29: Chapter 1/3
Feb 3: Lab Practical #1 Lab Safety and Microscope (Chapter 3)
Feb 5: Chapter 3
Feb 10: Chapter 3
Feb 12: Lecture Test #1 Chapters 1 and 3
Feb 17: Chapter 4
Feb 19: Chapter 4
Feb 24: Chapter 4/5
Feb 26: Chapter 5
Mar 3: Chapter 5
Mar 5: Lecture Test #2 Chapters 4 and 5
Mar 10: Spring Break
Mar 12: Spring Break
Mar 17: Chapter 7
Mar 19: Chapter 7
Mar 24: Lab Practical #2 Staining Test (Chapter 8)
Mar 26: Chapter 8
Mar 31: Chapter 8
Apr 2: Chapter 8
Apr 7: Lecture Test #3 Chapter 7 and 8
Apr 9: Chapter 18
Apr 14: Chapter 18
Apr: 16: Chapter 19
Apr 21: Chapter 19/20
Apr 23: Chapter 20
Apr 28: Lecture Test # 4
Apr 30: Chapter 6
May 5: Chapter 6 (Self Study) Library Work on Unknown
May 7: Comprehensive Final

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