COURSE SYLLABUS Spring 2019
SCIENCE MAJORS MICROBIOLOGY (BIOL 2421-73521)

DIVISION OFFICE
Math & Natural Science
Location: P330 Telephone: 972-273-3500

This course syllabus is intended as a guideline for Microbiology. Both North Lake College and the instructor reserve the right to make modifications in content, schedule, and requirements as necessary to promote the best education possible within prevailing conditions affecting this course.

**This instructor recommends students to save a hard copy, or an electronic copy of the syllabus and keep it as a reference of the material covered in the class. It is not unusual for colleges and universities to require copies of syllabi from transferring students.

Instructor Information:

Instructor: Nani W. Cooper
Email: nec0002@dcccd.edu
Office hours: Appointments by request

Course Information:

Title: Microbiology for majors
Course number: Biol 2421
Section number: 73521
Credit hours: 4
Class meeting time: Lecture T/R C214 5:45-7:05
Laboratory T/R C336 7:15-9:05
Course description: A study of the morphology, physiology and taxonomy of representative groups of pathogenic and non-pathogenic microorganisms. Emphasis is placed on relationships that influence humans: public health, infectious diseases, immunology, biotechnology and environmental/industrial applications. Lab experimentation with pure cultures and selected media will be used to study the medical, environmental and industrial importance of these microbes. Designed for students in science or pre-professional programs.
Course prerequisites: Biology 1406, Biology 1407 and Chemistry 1411.
LAB COAT MUST BE WORN AT ALL TIMES WHEN IN LABORATORY—NO EXCEPTIONS. **Students are required to wear protective lab clothing while working with microorganisms. It is required of students to wear a lab coat and close-toed shoes. Additionally, clothing should cover thighs and shoulders, long hair must be secured, and dangling jewelry should be removed. Students who do not follow these minimum safety requirements will not be allowed in lab.

Course Objectives: This 4 credit hour basic study of microbiology is designed for students with health-related majors or interest in health issues. Students will be introduced to the structure and properties of the different types of microbes (bacteria, fungi, protozoa, algae and viruses) and their impact in our lives: from maintaining our planet’s environment, role in creating useful products, to causing human diseases. Major emphasis will be placed on the interaction of microorganisms with human hosts in disease involving topics such as microbial pathogenesis, role of human immune defense system and methods of microbial control. The topics will be presented in the form of lectures & laboratory exercises. The laboratory exercises will also emphasize the basic skills in the manipulation of microorganisms in scientific studies.

Summary: Understanding the role of microorganisms in health and the environment. Communicate in writing the knowledge of microbiology concepts. Develop skills and safety awareness in performance of basic microbiology experiments. Ability to apply lab skills and critical thinking to identify unknown bacteria.

Specific Course Learning Outcomes:
1. Be able to explain the basic types of microorganisms and how they utilize basic chemical reactions to support their reproduction and other energy needs.
2. Be able to communicate effectively the design and expression of microbial genetics.
3. Be able to explain the hosts immune system and its response to invading microorganisms.
4. Be able to explain the strategies of pathogenic microorganisms and disease progression.
5. Acquire basic safety skills and awareness in conducting simple laboratory experiments involving the culture of microbes. Pass the “Sterile Techniques” competency.
6. Applying scientific methods, techniques, and critical thinking skills to independently solve bacterial identification puzzle.

THECB Learning Outcomes: Upon successful completion of this course, students will:
1. Provide examples of the impact of microorganisms on agriculture, ecosystem, energy, and human health, including biofilms.
2. Identify unique structures, capabilities, and genetic information flow of microorganisms.
3. Compare the life cycles and structures of different types of viruses.
4. Discuss how microscopy has revealed the structure and function of microorganisms.
5. Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
6. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
7. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
8. Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
9. Communicate effectively the results of scientific investigations.
10. Describe the causes and consequences of mutations on microbial evolution and the generation of diversity as well as human impacts on adaptation.
12. Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.

Assessment of Course Learning Outcomes:

1. Written Exams: Short answers and Multiple choice
2. In-class Practical tests: Performance of Experiments and written tests
3. Research on Topics in Microbiology
4. Evaluation of Lab Book Record Keeping and Participation in Class (including attendance)
5. Written Report on Individual Lab Experiment (“Unknowns”).

SCIENCE LEARNING CENTER: P333

The Science Center (SC) provides student services in the following subjects (majors and non-majors): Biology, Botany, Microbiology, Anatomy and Physiology, Chemistry, Geology, Botany, Physics and Ecology. The center is in P333 & P334 and offers various resources all of which are free to the students. The SC features tutors, software, videos, CDROM’s, internet, models, places to study quietly, places for group work, and other materials to assist in science classes. In order to access resources of the SC a North Lake College ID Card is required. The subject specific schedule of tutors is updated every semester and is located at [www.northlakebiology.com/SLC_tutor_schedule.htm](http://www.northlakebiology.com/SLC_tutor_schedule.htm). When students attend SC we ask that they sign in and out. This data helps us keep the center stocked, running, and most of all, free of charge!

**Hours of operation:** M-R 9-7; F-Sat 9-3

Coordinator: Amanda Mello.

Lecture Course Outline:

**Unit 1** – Chapters 1-6
1. Introduction to Microbiology
2. Molecules of Life
3. Cell structure: Prokaryotic and Eukaryotic
4. Cellular Metabolism: energy production

**Unit 2** – Chapters 7-10; 14-15
5. Genetics: Replication and Gene Expression
6. Genetic Change and Evolution
7. Biotechnology
8. Immune Defense: Specific and Non-specific immune responses

Unit 3 - Chapters 16-20, etc
9. Antimicrobial Drugs and Drug resistance
10. Principles of Disease and Pathogenicity
11. Bacterial Diseases

Unit 4 - Chapters 12-13, etc
12. Fungal and Algae Diseases
13. Viruses
14. Viral Diseases

Exams will be given after each Unit covered (~2/7, 3/7, 4/11, 5/14)

Laboratory Course Outline

Practical 1 (~2/26)
1. Lab Introduction and General Safety Procedures Microbiology
2. Microscopy studies of Microbes
3. Preparation of Microbial Samples for Observation: Simple Stain and Hanging Drop
5. Spore and Capsule Staining
6. Cultural Medium and Contamination
7. Pure Culture Techniques and Culture Maintenance
8. Microbial Growth: Temperature & Oxygen Influence
9. Control of Microbes: Temperature
10. Control of Microbes with Chemicals: Antiseptics, Disinfectants, Antimicrobial Drugs

Practical 2 (~5/7)
11. DNA Manipulations
12. Immunology: Agglutination Reactions/Blood-typing
13. Fungi
14. Protozoan
15. Microbiology of Water
16. Microbiology of Food
17. Studies of Physiological/Biochemical Characteristics of Bacteria
18. Discussion of Unknown Project 19. Performance of the Unknown Project

(Class will not meet 2/28, 3/12, 3/14. Note: Schedule is subject to change by the instructor).

Evaluation Procedures: Specific Learning and Evaluation Activities

Lecture: 60%
Lab 40%

Grading Scale A= 100 – 90 % B = 89 - 80 % C = 79 - 70 % D = 69 - 60 % F < 59%
There will be no make-up exams for unexcused absences. The grades earned in this course reflect the performance of each student. A student should NOT expect to have grades curved or to be given extra credit points, assignments, or projects to offset failing grades. This is a challenging course, so plan to study accordingly.

**Major Course Assignments and Examinations:**

**Lecture:** 600 points
There will be 3 major lecture exams (100 points/ea), a research presentation (50 points), weekly quizzes (50 points) and a comprehensive final (200 points).

**Lab:** 400 points
There will be 2 laboratory practicals. Questions are set in a series of stations which include lab experiment materials, students move at 2 minute intervals (100 points/ea), Identification of 2 unknowns (75 points/ea), Slide project (50 points). Practical 1 will also include hands on techniques such as staining, plating and an aseptic technique evaluation. Towards the end of the semester, students will be assigned an unknown bacterium. Students will have three weeks to perform the staining procedures and biochemical tests necessary to identify the genus and species of the unknown microorganism. Students will keep written records of their work in the form of a journal. A written report summarizing the procedures used to identify the organism will be turned in with the journal at the end of the three weeks.

**ATTENDANCE IS REQUIRED FOR EACH OF THE SCHEDULED LABS.**

**Policies:**

1. Attendance is mandatory. The University expects students to attend all classes regularly and punctually. Class attendance is normally addressed in the instructor’s syllabus. Absences do not exempt students from academic requirements. Students must consult with instructors regarding the completion of make-up work. Excessive absences, even if documented, may result in a student failing the course. Attendance helps determine your grade. If the absence is excused efforts will be made by the instructor together with the individual student to cover material. The student should initiate all efforts. All missed work must be completed within one week of excused absence. **PLEASE NOTE:** Poor attendance will preclude students from taking advantage of extra credit assignments and bonus points
2. Be on time and prepared for class.
3. Turn cell phones and pagers OFF during class. Laptops **ARE NOT** encouraged.
4. Withdrawing from a course: if a student is unable to complete the course(s) in which he/she is registered, it is the student’s responsibility to withdraw from the course by the appropriate date, which is published in the class schedule (April 17th). The instructor cannot initiate the drop process. If the student stops attending classes but does not officially withdraw, he/she will receive a performance grade, usually a grade of F.
5. The campus policy of no smoking and no eating in these lecture halls will be strictly observed. Bottled water may be brought into the lecture room.
6. No grades will be posted or given over the phone or by email.
7. If you wish to record lectures, please obtain permission of the instructor.
8. No bathroom breaks during exams, go before you come to class, if you must leave during a testing session you must turn in your completed exam at that time.

INSTITUTIONAL POLICIES: www.northlakecollege.edu/syllabipolicies

ACADEMIC DISHONESTY: The Student Code of Conduct prohibits academic dishonesty and prescribes penalties for violations. According to this code, which is printed in the college catalog, "academic dishonesty", includes (but is not limited to) cheating, fabrication, facilitating academic dishonesty, plagiarism, and collusion. 1) The Vice-President of Academic & Student Affairs may initiate disciplinary proceedings against a student accused of academic dishonesty. 2) Academic dishonesty includes, but is not limited to, cheating on a test, plagiarism and collusion. 3) Cheating on a test includes: a) Copying from another student's test paper; b) Using, during a test, materials not authorized by the person giving the test; c) Collaborating with another student during a test without permission to do so; d) Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of an unadministered test. e) Substituting for another student or permitting another student to substitute for you to take a test; and f) Bribing another person to obtain an unadministered test or information about an unadministered test. 4) "Plagiarism" means the appropriation of another's work (ideas and/or words) and the unacknowledged incorporation of that work in one's written work offered for credit. Quotes not identified as quotes constitute a form of plagiarism even if the borrowed ideas are documented. 5) "Collusion" means an unauthorized collaboration with another person in preparing written work offered for credit.

Academic dishonesty may result in the following sanctions, including, but not limited to: 1. A grade of zero or a lowered grade on the assignment or course. 2. A reprimand. 3. Suspension from the college.

NOTIFICATION OF ABSENCE DUE TO RELIGIOUS HOLY DAY(S): Students who will be absent from class for the observance of a religious holiday must notify the instructor in advance. Please refer to the Student Obligations section of the college catalog for more explanation. You are required to complete any assignments or take any examinations missed as a result of the absence within the time frame specified by your instructor.

REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT: (A430) North Lake College provides academic accommodations to students with disabilities, as defined under ADA law. It is the student's choice and responsibility to initiate any request for accommodations. If you are a student with a disability who requires such ADA accommodations, please contact North Lake College's Disability Services Office in person (A430) or by phone at 972-273-3165. http://www.northlakecollege.edu/resources/disability.html

FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT OF 1974 (FERPA): In compliance with the Family Educational Rights and Privacy Act of 1974 (FERPA), the College may release information classified as "directory information" to the general public without the written consent of the student. Directory information includes: (1) student name, (2) student address, (3) telephone numbers, (4) date and place of birth, (5) weight and height of members of athletic teams, (6) participation in officially recognized activities and sports, (7) dates of attendance, (8) educational institution most recently attended, and (9) other similar information, including major field of student and degrees and awards received. Students
may protect their directory information at any time during the academic year. If no request is filed, directory information is released upon written inquiry. No telephone inquiries are acknowledged. No transcript or academic record is released without written consent from the student, except as specified by law.

**ADMINISTRATIVE WITHDRAWAL**: Students with valid extenuating circumstances may be eligible for an administrative withdrawal by the Dean of the Division in which the course or courses are taught. An administrative withdrawal will not be awarded to students who simply fail to withdraw prior to the last day to receive a “W.” The request for an administrative withdrawal must be made in writing to the Dean of the Division with any supporting documentation attached. This must occur before the last official day of the semester.

**DROP POLICY**: If you are unable to complete this course, you must officially withdraw by: Check e-Connect for dates. Withdrawing is a formal procedure which you must initiate; your instructor cannot do it for you. All Dallas County Community Colleges charge a higher tuition rate to students registering the third time for a course. This rule applies to the majority of credit and Continuing Education / Workforce Training courses. Developmental Studies and some other courses are not charged a higher tuition rate. Third attempts include courses taken at any DCCCD college since the fall 2002 semester. For further information, go online to: http://www.DCCCD.edu/thirdcourseattempt.

**STOP BEFORE YOU DROP**: For students who enrolled in college level courses for the first time in the fall of 2007, Texas Education Code 51.907 limits the number of courses a student may drop. You may drop no more than 6 courses during your entire undergraduate career unless the drop qualifies as an exception. Your campus counseling/advising center will give you more information on the allowable exceptions. Remember that once you have accumulated 6 non-exempt drops, you cannot drop any other courses with a “W”. Therefore, please exercise caution when dropping courses in any Texas public institution of higher learning, including all seven of the Dallas County Community Colleges. For more information, you may access: https://www1.dcccd.edu/coursedrops  Drop dateline is April 17, 2019.

**STUDENT AND EMPLOYEE RIGHTS AND RESPONSIBILITIES**: Dallas County Community College District is committed to creating an educational and work environment free from use or distribution of illicit drugs or abuse of alcohol. The college district prohibits the unlawful possession, use or distribution of illicit drugs and alcohol by students and employees on its property or as part of any of its activities. Information and confidential referrals concerning counseling and treatment programs for drug and alcohol abuse may be obtained from any counseling and/or advisement center, health center or location Human Resources office. More information about the Drug Free Schools and Communities Act is included in the 2016-2017 Student and Employee Rights and Responsibilities brochure. Also included is information about bacterial meningitis vaccination requirements, DCCCD’s Student Code of Conduct and notice on hazing, Title IX and campus sexual assault, and student rights under the Family Educational Rights and Privacy Act (FERPA).

**FINANCIAL AID ATTENDANCE AND PARTICIPATION REQUIREMENTS**: FACE-TO-FACE ON-CAMPUS CLASSES: You must attend and participate in your on-campus in order to receive federal financial aid. Your instructor is required by law to validate your attendance in your on-campus in order for you to receive financial aid. You must participate in an academic related activity pertaining to the course such as but not limited to the following examples: • initiating contact with your instructor to ask a question about the academic subject studied in the course; • submitting an academic assignment; • taking an
exam; • completing an interactive tutorial; • participating in computer-assisted instruction; • attending a study group that is assigned by the instructor; • or participating in an online discussion about academic matters relating to the course. ONLINE CLASSES In an online class, simply logging in is not sufficient by itself to demonstrate academic attendance. You must demonstrate that you are participating in your online class and are engaged in an academically related. Your instructor is required by law to validate/certify your attendance in your online course(s) for you to receive financial aid. To meet the attendance requirement, you must attend and participate in your online course(s) prior to the course certification date and continue beyond the course withdrawal date. • participate in an academic related activity pertaining to the course such as but not limited to the following examples: initiating contact with your instructor to ask a question about the academic subject studied in the course; submitting an academic assignment; taking an exam; completing an interactive tutorial; participating in computer-assisted instruction; attending a study group that is assigned by the instructor; or participating in an online discussion about academic matters relating to the course. Students who are receiving any form of financial aid should check with the Financial Aid Office prior to withdrawing from classes. Withdrawals may affect your eligibility to receive further aid and could cause you to be in a position of repayment for the current semester. Students who fail to attend or participate are also subject to this policy. To apply for financial aid in the DCCCD, students must complete FAFSA (Free Application for Federal Student Aid) on the web at: http://www.fafsa.ed.gov

COUNSELING SERVICES: (A311) Counseling services for personal issues are provided to all students currently enrolled at North Lake College at NO CHARGE. These services are provided by licensed professionals who are bound by confidentiality (within ethical parameters). With the assistance of a counselor, students can identify, understand, resolve issues and develop appropriate skills. To make an appointment call 972-273-3333 or visit A311. For additional information, go to: http://northlakecollege.edu/services-and-resources/health-and-wellness/counselingservices • The iRead Lab offers individual and small group tutoring, as well as workshops, to help current students improve their reading, study, and test taking skills. • The Writing Center to help students clarify writing tasks, understand instructors’ requirements, develop and organize papers, explore revision options, detect grammar and punctuation errors, properly use and document sources, and improve their writing skills. • The Online Writing Lab (OWL) allows students to submit papers to our writing tutors electronically and get feedback within 24-72 hours. The OWL can be accessed through eCampus. - After logging on to eCampus, click on the Community Tab at the top. - Type “Owl” in the search field and click “Go.” - Next, click on the double drop-down arrows next to “NLC-OWL2,” and then click on “Enroll.” - Once enrolled, students can receive services from the OWL. • The Blazer Internet Lounge with 12 computers, additional open seating, and WiFi Internet access.

DCCCD OIE FACULTY SYLLABI STATEMENT: The Office of Institutional Equity, in coordination with DCCCD colleges, has the primary responsibility for reviewing, updating and implementing compliance policies and procedures. The Institutional Equity and Compliance Officer and the Office of Institutional Equity will ensure compliance with College District policies, federal and state laws related to sexual assault, Title IX, Title II (Americans with Disabilities Act) and the Military Veterans Full Employment Act to support diversity and inclusion.

REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT: (A430) North Lake College provides academic accommodations to students with disabilities, as defined under ADA law. It is the student’s choice and responsibility to initiate any request for accommodations. If you are a student with a
disability who requires such ADA accommodations, please contact North Lake College’s Disability Services Office in person (A430) or by phone at 972-273-3165.  
http://www.northlakecollege.edu/resources/disability.html

**STUDENTS WITH DISABILITIES:** If you are a student with a disability and/or special needs, or if you think you may have a disability, please contact the college Disability Services Office (DSO). Please note that all communication with DSO is confidential. If you are eligible for accommodations, please provide or request that the DSO send your accommodation letter to me as soon as possible (students are encouraged to contact DSO at the beginning of the semester). For more information regarding the College Disability Services Office, please visit the Student Services website: dcccd.edu/DSO Offices or contact DCCCD Office of Institutional Equity at (214) 378-1633. North Lake 972-273-3165

**A NOTE ON HARASSMENT, DISCRIMINATION AND SEXUAL MISCONDUCT:** We are committed to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX and DCCCD policy prohibit harassment, discrimination and sexual misconduct. If you encounter harassment, sexual misconduct (sexual harassment, sexual assault, stalking, relationship violence, stalking), retaliation or discrimination based on race, color, religion, age, national origin, disability, sex, sexual orientation, gender identity, and/or gender expression, please contact your College Title IX Coordinator or the Office of Institutional Equity. We treat this information with the greatest degree of confidentiality possible while also ensuring student welfare and college safety. We are concerned about the well-being and development of our students and are available to discuss any concerns. There are both confidential and nonconfidential resources and reporting options available to you. If students wish to keep the information confidential, please contact the college Counseling or Student Health Services. As required by DCCCD policy, incidents of discrimination and/or sexual misconduct shared with faculty will be reported to the College Title IX Coordinator or District Title IX Coordinator. The Title IX Coordinator will contact the student and determine if further investigation is needed. For more information about policies, resources or reporting options, please contact your college Title IX Coordinator or visit www.dcccd.edu/titleIX. District Title IX Coordinator Office of Institutional Equity LaShawn Grant TitleIX-District@dcccd.edu 214-378-1633