



Microbiology (BIO 203a) COLS, Dept. Mathematics & Natural Sciences Course Outline

Instructor: Mr. T. Kennedy

Office Hours: via email and Virtual Office

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Course Description

This course will introduce the students to laboratory safety and procedures for handling biological specimens. The methods of identification of microorganisms, both microscopic and by diagnostic media will be emphasized. Students will work with a selection of the most common medically significant microorganisms including bacteria, protists, fungi and parasites. This course emphasizes techniques essential to microbiology including aseptic technique, isolation of a single colony by quadrant streak method, preparation of a pure culture and inoculation. In addition, preparation of stained slides and wet mounts, microscopic observations, and the determination of antibiotic susceptibility will be learned. Students will culture and study the normal flora of the throat, skin, and surface of everyday items. Students will gain an understanding of the difference between sterile conditions and disinfection.

Course Objectives of Microbiology (BIO 203A)

Learning Outcomes

1. Learn about laboratory safety, proper conduct, and correct handling of biological specimens.
2. Prepare, observe, and interpret stained slides of bacteria using microscopy.
3. Aseptically transfer, culture bacteria, and isolate individual colonies by using the streak technique.
4. Use differential and selective media to isolate and identify various bacteria.
5. Test microbial susceptibility using different chemical agents.
6. Culture bacteria from common surfaces and substrates.
7. Identify samples of unknown bacteria using deductions and systematic testing

Expectations and Requirements

National University's goal is for all students to achieve their academic potential, and to have a positive learning experience in the BIO 201-203 series. Department of Mathematics and Natural Sciences has developed advice for students for the courses BIO 201-203. The purpose of this advice is to ensure that students are properly prepared for the materials in these courses.

The Department's advice to students is:

1. Health Science and Pre-Nursing students that are new to National University should take the Areas A-E program requirements (e.g. ENG 100, ENG 101, COM 200, ILR 260) before taking BIO 201-203. This will enable students to adjust to the pace of National University, while strengthening their written communication and exam skills.
2. Before taking BIO 201-203, students should have taken introductory biology (BIO 100, 100A, 101, 101A) and chemistry, or the equivalent, within the past 5 years.
3. Students should take BIO 201-203 in the numerical sequence. This scheme familiarizes students with the laboratory before taking BIO 203, which is the most laboratory intensive course.

Please take a moment to review your own academic history to be sure you meet the recommended prerequisites for BIO 203 & BIO 203A. If you decide to withdraw from these courses, please be sure to talk to an advisor and to complete the appropriate paperwork or you will receive a letter grade of "F" at the end of the semester.

Academic Dishonesty

There is zero tolerance for academic dishonesty in this class. You may discuss assignments with classmates; however, **you are responsible to write and complete your own assignments**, which should reflect your own work. Copying the work of another student, cheating on an exam or plagiarizing will result in an automatic failure of the course.

Student Responsibilities

Students are responsible for:

- a) Attending every class session and completing all laboratory exercises
- b) **Completing reading assignments prior to each class meeting.**
- c) Completing the Midterm and Final Exams and Lab Exercises

Expectations and Requirements - University policies, as stated in the catalog, are the guidelines that must be followed. Additionally:

- Be in your seat on time for every lab especially after breaks. MUST wear closed-toe shoes!
- Bring your lab manual, lab notebook and textbook to each class period.
- Stay focused on the subject of the lab.
- Keep up with reading assignments.
- Please come prepared for each lecture and lab session. It will be essential to have **read and prepare for the lab experiments ahead of time** in order to finish them by the end of class.
- You will be working with both nonpathogenic and pathogenic microorganisms. These require special precautions. Therefore, if you are deemed to be unprepared for the lab, or seem unfocused, or are not following the required lab safety rules, you may be asked to excuse yourself in order to preserve a safe lab situation for everyone.
- **Attendance:** In accordance to the NU catalogue, regular and punctual attendance is required of all students. Attendance is MANDATORY at each lab session. **Withdrawals:** Each student must be familiar with the regulations concerning attendance and withdrawal procedures. They may be found in the NU catalogue.
[\[http://www.nu.edu/OurPrograms/StudentServices/AcademicPoliciesandP/CourseSchedulingandW.html\]](http://www.nu.edu/OurPrograms/StudentServices/AcademicPoliciesandP/CourseSchedulingandW.html)

You play an important role in determining your outcome of this class. Because of the short and concentrated nature of these courses, attendance at every lecture and lab class is MANDATORY. Due to the perishable and pathogenic nature of the microbes, labs, quizzes, and assignments CANNOT be made up. Health, family, or work emergencies may be considered. Students **must produce** written evidence of an emergency (e.g. official letter from work, police, or hospital) to be able to make up for quizzes and midterm.

REQUIRED TEXTBOOK(S)

Collaborate Sessions

Live sessions using Blackboard Collaborate are optional and done at the discretion of the Instructor.

COURSE GRADING

Students are responsible for:

1. Completing all assigned reading. Plan time to read material multiple times.
2. Review PowerPoint slides and pre-recorded lectures. Review all materials posted in Blackboard.
3. Completing three Exams
4. Complete 5 quizzes
5. Complete 4 case studies on specific microbial topics
6. Complete weekly discussion posts: original thread and 2 follow-up responses to peers' threads

Assignments

Case Studies (20pts each)	80 points
Lab Exam 1	100 points
Lab Exam 2	100 points
Lab Exam 3	100 points
Quizzes (25 pts each)	125 points
TOTAL	505 points

Grade Correlation

96 -100	A	74 – 76	C
90 - 95	A-	70 – 73	C-
87 – 89	B+	67 – 69	D+
84 – 86	B	64 – 66	D
80 – 83	B-	60 – 63	D-
77 – 79	C+	< 59	F

Late work and missed exam policy

The late paper policy for homework assignments is to be specified by the instructor. Otherwise late assignments: for each day after the due date that an assignment is turned in late, its point credit will be reduced by 25%. In case a student cannot take an exam on the scheduled day because of extraordinary circumstances, he/she must warn the instructors; then the exam will be rescheduled without a loss in points. The instructor may require proof of extraordinary circumstance (health, family, or work emergencies).

Exams & Quizzes

There will be three unit examinations. There will be **NO MAKE-UP** examination given. Each exam and quizzes are timed. The questions will consist of: multiple choices, T/F, short answer and matching. Changes in exam and quiz dates will be announced at least a week in advance. Health, family, or work emergencies may be considered. Students must produce written evidence of an emergency (e.g. official letter from work, police, or hospital) to be able to make up exams.

Schedule of classes

We will follow this schedule as closely as possible. Changes to the schedule will be announced.

Microbiology Lab 203A Schedule

Week	Date 2020	
		Laboratory Topics (BIO 203A)
1	9/2	Biosafety Labster Topics to discuss: biosafety, microscopy Lecture 1 Microscope FIB Quiz 1 (Sat. 9am)
2	9/9	Gram staining Case Study 1 Due (Wed 10 pm) Lecture 2 and 4 Staining FIB Topics: cell wall structure, staining, simple, Gram, acid fast etc. Quiz 2 (Sat. 9am)
3	9/16	Isolation of bacteria Topics to discuss: Culture media, aseptic technique, streaking etc. Intro to differential and selective media. Lecture 5 Growth FIB Review Ch 3 and 6 OpenStax lecture Lab Exam 1 (Sat. 10am)
4	9/23	Bacterial growth curve Labster + Control of Growth Bacterial quantification by culture Labster Case Study 2 Due (Wed. 10 pm) Topics: bacterial growth curve, quantification, CFUs. Consider talking about anaerobes. Quiz 3 (Sat. 9am)
5	9/30	Identification of unknown bacteria Labster* Bacterial identification techniques : biochemical techniques, differentia-selective media. Lecture 8 and 16 Bacterial ID FIB Quiz 4 (Sat. 10am)
6	10/7	Cont. of previous- consider explanations of medical cultures (throat/Streptococci, skin/Staphylococci etc) Bacterial Quantification by Culture Case Study 3 Due (Wed. 10 pm) Review Ch 6 and 7 OpenStax lecture Lab Exam 2 (Sat. 9am)
7	10/14	HHMI virtual lab- bacterial identification using 16S PCR

		Modern diagnostic techniques. Topics: disinfectants & antibiotics, methods to measure, disk diffusion, e-test etc. Review for Final- Review Ch 10, 18, 20 OpenStax lecture Quiz 5 (Sat. 9am)
8	10/21	Case Study 4 Due (Wed. 10 pm) Lab Exam 3- Final Exam (Wed. 6:00pm)

NATIONAL UNIVERSITY RESOURCES AND POLICIES

Student Accessibility Services

National University is committed to providing equitable access to learning opportunities for all students. Student Accessibility Services (SAS) is the office that collaborates with students who have disabilities and faculty members to provide and/or arrange reasonable accommodations.

- If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact SAS at sas@nu.edu or 858.521.3967 to arrange a confidential discussion regarding equitable access and reasonable accommodations. To receive any course-related adaptation or accommodation, the student must first be registered with SAS; registration information and steps can be found by visiting www.nu.edu/sas. The SAS team works with students confidentially and does not disclose disability-related information without his/her permission.
- If you are already registered with SAS and have a current accommodation letter outlining approved accommodations, we encourage you to contact your instructor early in the term, by the first class session preferably, to review how the accommodations will be applied in the course. You are encouraged to arrange a confidential phone or in person meeting with your professor to discuss the approved accommodations.

Plagiarism

Plagiarism is the presentation of someone else's ideas or work as one's own. Students must give credit for any information that is not either the result of original research or common knowledge. If a student borrows ideas or information from another author, he/she must acknowledge the author in the body of the text and on the reference page. Students found plagiarizing are subject to the penalties outlined in the Policies and Procedures section of the University Catalog, which may include a failing grade for the work in question or for the entire course.

- Plagiarism means using another person's work, writing, words, ideas, research, graphics, programs, music, pictures, data, and/or other creative expression without giving the other person full credit. Student must enclose another person's words in quotation marks, cite the appropriate source(s), and give citations when using the ideas of another person, even if those ideas are paraphrased. The following is one of many websites that provide helpful information concerning plagiarism for both students and faculty:
- Any time information from a source is used, it must be cited.

Ethics

Ethical behavior in the classroom is required of every student. The course will identify ethical policies and practices relevant to course topics.

Technology

Students are expected to be competent in using current technology appropriate for this discipline. Such technology may include word processing, spreadsheet, and presentation software. Use of the internet and e-mail may also be required.

Diversity

Learning to work with and value diversity is essential in every class. Students are expected to exhibit an appreciation for multinational and gender diversity in the classroom.

If you need accommodations due to a documented disability, please contact the Office of Scholarships and Special Services at (858) 642-8185 or via e-mail at specialservices@nu.edu. Accommodations can only be granted upon approval by the Committee for Students with Disabilities (CSD). Students should make the instructor aware of any documented disabilities as soon as possible.

Civility

As a diverse community of learners, students must strive to work together in a setting of civility, tolerance, and respect for each other and for the instructor. Rules of classroom behavior (which apply to online as well as onsite courses) include but are not limited to the following:

- Conflicting opinions among members of a class are to be respected and responded to in a professional manner.
- There are to be no offensive comments or language

Math Center

Tutoring services in the fields of mathematics, sciences, engineering and business mathematics, including help with calculator usage, Excel, SPSS and Minitab applications are included in the study assistance extended to National University students.

Mathematics tutors are available free of charge to National University students. Since the request for help is online, any student from any National University academic center can access this service.

Tutors are available Monday through Thursday afternoons and evenings and by appointment on weekends. Once a student makes an appointment at through the online Math Center, a math tutor is assigned to contact the student and arrangements can then be made between tutor and student.

URL: <https://www.nu.edu/OurPrograms/StudentServices/mathcenter.html>

Writing and Critical Thinking Across the Curriculum

Students are expected to demonstrate writing and critical thinking skills in describing, analyzing and evaluating ideas and experiences. Written reports and research papers must follow specific standards regarding citations of an author's work within the text and references at the end of the paper. Students are encouraged to use the services of the University's Writing Center when preparing materials.

URL: <https://www.nu.edu/OurPrograms/StudentServices/WritingCenter.html>

The following website provides information on APA, MLA, and other writing and citation styles that may be required for term papers and the like: <http://nu.libguides.com/citations>

National University Library

National University Library supports academic rigor and student academic success by providing access to scholarly books and journals both electronically and in hard copy. Print materials may be accessed at the Library in San Diego or through document delivery for online and regional students. Librarians are available to provide training, reference assistance, and mentoring at the San Diego Library and virtually for online or regional students. Please take advantage of Library resources.

URL: <http://library.nu.edu>.

Contact the Library:

- RefDesk@nu.edu
- (858) 541-7900 (direct line)
- 1-866-NU ACCESS x7900 (toll free)

The following website might be useful for you to find peer-reviewed, research articles on your PowerPoint presentation topic.

Google Scholar

NCBI: <https://www.ncbi.nlm.nih.gov/pubmed/>

NU Library: <https://library.nu.edu/>

PLOS: <https://www.plos.org/>

Help for Blackboard: 1-(866) 628-8988 or SCS@nu.edu