North Central State College

MASTER SYLLABUS	2025-2026

A. Academic Division: Health Sciences

B. Discipline: Science

C. Course Number and Title: BIOL1550 Microbiology for Health Professionals

D. Assistant Dean: Heidi Kreglow, PT

E. Credit Hours: 3
Lecture: 2 hours
Laboratory: 2 hours

F. Prerequisites: None

G. Last Course/Curriculum Revision Date: Fall 2023 Origin date: 03/10/2011

H. Textbook(s) Title:

Open Education Resources (available for download or view)
BIOL 1550: Microbiology (2025) - OER Materials
- Author: Curated/Customized by J. DasGupta
- Copyright Year: 2025
- Edition: 1st
- ISBN:
- OER LINK: https://bio.libretexts.org/Courses/North_Central_State_College/BIOL_1550%3A_Microbiology_(2025)

I. Workbook(s) and/or Lab Manual: Course lab manual provided by instructor.

J. Course Description: This course is designed for allied health and nursing majors. It explores the major groups of microorganisms and the role they play in the environment and in disease. The host-parasite relationship, human immunity to disease, epidemiology, and the control of microorganisms are also addressed. Laboratory exercises provide the student with the basic techniques of microbial identification, microscopy, sterile technique, and basic infection control.

K. College-Wide Learning Outcomes

College-Wide Learning Outcomes	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Identify the major historical figures and describe their contribution to the development of modern microbiology.	Lecture quizzes and exams the first third of the semester and end of the semester.
2. Identify the major characteristics of bacteria, including morphology, metabolism, and growth characteristics.	Lecture quizzes and exams the first third of the semester and end of the semester. Lab quizzes the first third of the semester.
3. Describe the major characteristics of the non-bacterial microbes including the Rickettsias, Chlamydias, Fungi, and Protozoa.	Lecture quizzes and exams the second third of the semester and end of the semester.
4. Identify the structure of viruses and describe the cycles of viral reproduction.	Lecture quizzes and exams the second third of the semester and end of the semester.
5. Describe patterns and dynamics by which disease spreads through a human population.	Lecture quizzes and exams the second third of the semester and end of the semester. Lab quiz last week of semester.
6. Identify common pathogens that cause disease in humans and describe some of the basic chemotherapeutic treatments for the disease.	Lecture quizzes and exams throughout the semester.
7. Describe the physical and chemical control methods for microorganisms.	Lecture quizzes and exams throughout the semester. Lab quizzes following Lab Exercises 10, 11, 13, and 14 (in Lab Content section).
8. Become acquainted with common staining and culture techniques used to study microorganisms in the laboratory.	Lab quizzes following Lab Exercises 4 - 8 (in Lab Content section).

M. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00-59	F	0.00	Failure

N. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences. Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

* *Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation*

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf

North Central State College

SYLLABUS ADDENDUM

Academic Division:	Health Sciences	**Discipline:**	Biology
Course Coordinator:	Jaydip Das Gupta Ph.D.		
Course Number:	BIOL-1550/BIOL -1550L	**Course Title:**	Microbiology for Health Professional
Semester / Session:	Spring 2026 (16 weeks)	**Start / End Date:**	1/12/2026 – 5/8/2026

Instructor Information

Name:	Jaydip Das Gupta Ph.D.	**Credentials:**	M.Sc, Ph.D.
Phone Number:	419-755-4872	**E-Mail Address:**	Jdasgupta@ncstatecollege.edu
Office Location:	HS 332	**Office Hours:**	See the course schedule

I. Topical Timeline (Subject to Change):

Lecture Schedule:

		BIOL 1550-911 (Thursday 1.15 pm - 3.05 pm) BIOL 1550-912 (Wednesday 5 pm - 6.50 pm) BIOL 1550-915 (Monday 6.00 pm - 7.50 pm)
Date	**Chapter**	**Topic**
12-Jan	1	Intro to Microbiology
19-Jan	2	Biochemistry basic
26-Jan	3	Introduction to prokaryotic cells
		Lecture Exam 1 (During lab time)
2-Feb	4	Introduction to Eukaryotic cells
9-Feb	7	Fundamentals of Microbial growth
16-Feb	8	Microbial Metabolism
		Lecture Exam 2 (During lab time)
23-Feb	5	Genetics
9-Mar		**Spring Break (College Closed)**
16-Mar	14	Biotechnology
23-Mar	6	Virus and Prion
		Lecture Exam 3 (During lab time)
30-Mar	15	Antibiotics
6-Apr	10	Host microbe interaction
13-Apr	11, 12	Innate immunity and adaptive immunity
		Lecture Exam 4
20-Apr	16, 19	Respiratory and Digestive system infection
27-Apr	17, 20	Skin, Urinary and Reproductive system infection
4-May		**COMPREHENSIVE FINAL (In Lab)**

Lab schedule:

BIOL 1550L-02 Lab meets on Tuesday at 3.30 pm till 5.20 pm
BIOL 1550L-33 Lab meets on Tuesday at 6.00 pm till 7.50 pm
BIOL 1550L-01 Lab meets on Thursday at 9.00 am till 10.50 am
BIOL 1550L-34 Lab meets on Thursday at 3.30 pm till 5.20 pm

(Schedule subject to change to accommodate all experiments)

Date	Topic
Jan 13/15	Introduction: Safety and Laboratory Guidelines Basic Growth Media Preparation (review) Common Aseptic Transfers and Inoculation Methods
Jan 20/22	Ubiquity of Microorganisms Colony Morphology Exercise Growth Patterns on Slants Exercise Growth Patterns in Broth Exercise
Jan 27/29	Introduction to the Light Microscope Gram staining of known organism
Feb 03/05	**Lecture exam 1 (During lab)** Gram staining of unknown organism (Grading)
Feb 10/12	Endospore and Acid-fast staining method with grading
Feb 17/19	Serial dilution introduction and experiment
Feb 24/26	**Lecture exam 2 (During lab)** Serial dilution result analysis
Mar 3/5	Differential test introduction Phenol Red Broth Starch Hydrolysis
Mar 10/12	**Spring break (No class)**
Mar 17/19	Differential Test: Urea Hydrolysis SIM Medium
Mar 24/26	Analysis of differential Test MacConkey Agar Eosin Methylene Blue Agar
Mar 31/Apr 2	**Lecture exam 3 (During lab)** Antimicrobial Susceptibility Test (Kirby-Bauer test)
Apr 7/9	Evaluation of Disinfectants/Antiseptics
Apr 14/16	Differentiation of Gram Positive Cocci Anaerobic Jar

Mannitol Salt Agar
Catalase Test
Blood agar test

Apr 21/23 Result analysis of Gram positive Cocci experiment
Hand washing experiment

Apr 28/30 Quantitative Indirect ELISA experiment

May 5/7 **Comprehensive lecture final**

Upon successful completion of this course, the course outcome will be as follows:

Lecture Outcomes	Assessments – How it is met & When it is met
1. Identify four different macromolecules which make up a living cell.	Lecture, lab quizzes and exams throughout the semester.
2. Identify the major historical figures and describe their contribution to the development of modern microbiology.	Lecture, lab quizzes and exams throughout the semester.
3. Classify microorganisms and how they have adapted to and shaped our environment.	Lecture, lab quizzes and exams throughout the semester.
4. Compare and contrast how we visualize microorganisms using different types of microscopes.	Lecture, lab quizzes and exams throughout the semester.
5. Examine morphological and physiological characteristics of prokaryotes microorganisms and infectious particles.	Lecture, lab quizzes and exams throughout the semester.
6. Compare and contrast prokaryotic and eukaryotic microorganisms.	Lecture, lab quizzes and exams throughout the semester.
7. Explain the difference between bacteria and viruses, compare and contrast the life cycle of bacteria and viruses.	Lecture, lab quizzes and exams throughout the semester.
8. Describe the various methods of controlling the growth of microorganisms and the possible impact of improper use of antimicrobial agents.	Lecture, lab quizzes and exams throughout the semester.
9. Explain different steps of the microbial growth curve.	Lecture, lab quizzes and exams throughout the semester.
10. Explain how microbes acquire and process nutrients and convert them into energy and raw materials for cell growth and repair.	Lecture, lab quizzes and exams throughout the semester.
11. Explain the mechanisms of molecular genetics as it relates to microbial function.	Lecture, lab quizzes and exams throughout the semester.
12. Explain some of latest biotechnological trends and how we use it to identify unknown microorganisms with reference to PCR, microarray etc.	Lecture, lab quizzes and exams throughout the semester.
13. Explain the mode of action of different types of antibiotics and impact of antibiotic resistance in microorganisms.	Lecture, lab quizzes and exams throughout the semester.
14. Describe the microbial mechanisms of pathogenicity.	Lecture, lab quizzes and exams throughout the semester.

15. Compare and contrast innate (nonspecific) host defenses and adaptive (specific) host defenses of the human body to protect against infectious diseases.	Lecture, lab quizzes and exams throughout the semester.
16. Describe, discuss and classify select diseases caused by prokaryotic, eukaryotic organisms and infectious particles.	Lecture, lab quizzes and exams throughout the semester.

II. Course Assignments:

1. Quizzes
2. Tests
3. Skills Testing
4. Independent Studies

III. Grading and Testing Guidelines:

The overall class grade will be determined as follows:

Lecture and lab attendance: 5%
Lecture quizzes and exam: 65%
Lab quizzes: 30%

Total grade: 100%

There will be a few lab quizzes, the dates will be announced later based on the progress.

*****Note: Both lecture and lab attendances are mandatory. After three consecutive absences, I have the authority to report to the Dean/Assistant Dean and administrative withdraw from the course*****

IV. Examination Policy:

Quizzes: There will be a bunch of quizzes given throughout the semester. There will be about 10 questions. Quizzes CANNOT be taken after the due date/time. If you miss a quiz, you will be graded zero for that quiz. There will be about three days to take the quiz online. The time frame of the quiz will be found in the assignment folder.

Lecture exam: There will be four exams and one comprehensive exam as mentioned. Each exam will be worth 100 points, Final will be 150 points. The exam will be in-person during the lab time. **EVERYBODY HAS TO BRING OWN COMPUTER DURING THE EXAM, NO EXCEPTION. IF YOU DO NOT HAVE COMPUTER, CONTACT THE COLLEGE WELL AHEAD FOR LOANER COMPUTER.** The questions will be a combination of multiple choice, matching, fill in the blanks or any combination. The time frame of the exam will be mentioned later. **Exams CANNOT be taken after the due date/time. If you miss an exam or quiz, I have the authority to put zero for that missing exam.** It is YOUR responsibility to take the exam on time!

The reasons why a student will be excused from taking an exam or quiz:

a. Hospitalization (with documented verification)
b. Death in the immediate family (with documented verification)
c. Personal illness or illness in immediate family - (doctor's excuse required).
d. Missing exam/quiz for vacation/fun will absolutely not be excused by any means. I have the full authority to grade zero.

V. Class Attendance/Assignments and Make-Up Policy:

The lecture will be via Zoom and attendance is mandatory. The laboratory will be in-person. The Zoom links for the lectures will be under the Zoom folder. The instructor needs to be notified as soon as possible if a student needs to

miss lecture/lab or will be unable to turn in an assignment on time. Excuses/Extensions (for illness, family emergencies, etc.) can be made on a case-by-case basis, but are granted very rarely and are not guaranteed.

Every student should have their camera on during the entire Zoom lecture session. I have the authority to mark you absent for camera off during the session.

VI. Classroom Expectations:

All communications & conduct in this course is subject to the NC State Student Code of Conduct
General Professionalism Expectations
In general, as a future professional in your field, **you will be expected to conduct yourself as a professional in this course in ALL communications** - assignments, discussion forums, Canvas Inbox, emails etc.
This expectation includes *but is not limited to*:

- **Being respectful of classmates' opinions, work and comments**
  Good test = Is this something I would/should say to a co-worker in person?
- **Being respectful in communications with the instructor**
  Good test = Is this something I would/should say to my boss in the workplace?
- **Being respectful of diversity**
  Good test = Is this a comment/joke that is at some other groups, ethnicity, political etc. expense?
  Note: Offensive "jokes", slurs or hate speech will NOT be tolerated
  - **This will immediately escalate to a second level offense if it occurs.**
- **Using Non-Profane, Appropriate Language**
  Good test = Is this language you would use in the workplace or in front of your grandmother?
- **Using proper. NON-"Text speak" Language to make Yourself Easily Understood**
  Good test = Could my older boss understand what I have written?

Consequences for Failure to Meet These Expectations
Failure to meet these standards will result in the following consequences in this course:
1st Level=
Written warning from the instructor documenting issue
(No points deductions)
2nd Level=
Mandatory meeting with the instructor and or Department Chair or Division Dean
(Related assignment/Participation subject to Point Deductions)
3rd Level=
College Disciplinary procedures filed with the NC State Judicial Committee as a violation of the NCSC Student Code of Conduct (Links to an external site.).
(Course Grade subject to F)
NOTE: For an extreme single incident of disruptive unprofessional behavior I reserve the right to go directly to initiating college disciplinary procedures
NCSC Disciplinary hearings can result in a variety of consequences, including and up to suspension or being expelled from the college.
Resources:

- University Etiquette 101: How to Deal with Your Professors (Links to an external site.)
- Email Etiquette for Students