## Tompkins Cortland Community College Master Course Syllabus

## **Course Discipline and Number: BIOL112**

## Year: 2024-2025

**Credit Hours: 3** 

#### Course Title: Essentials of Medical Microbiology

**I. Course Description:** Provides a general overview of principles in medical microbiology, including morphology, physiology, genetics and structure, and function of microorganisms. Epidemiology, host/microbe interaction and control, and infectious diseases are emphasized. Emerging infectious diseases and bioterrorism are addressed. Microbiology laboratory experiences are integrated throughout the course. This is not a science–majors level general microbiology (BIOL216) course that may be required in advanced degree programs. BIOL112 fulfills the SUNY General Education Natural Sciences requirement. Prerequisites: college prep biology and chemistry or completion of BIOL101 and prior or concurrent CHEM101. ENGL100 if required by placement testing. 3 Cr. (2 Lec., 2 Lab.) Spring, Summer and Fall semesters.

#### II. Additional Course Information:

1.		This course can fulfill requirements for the Nursing A.A.S. degree and/or Biotechnology certificate.
2.		This course uses active engagement activities including case studies and discussions
3.	•	The SUNY supported course management system (BrightSpace) is used to post the course syllabus, outline, course materials and related links. Including on-line quizzes, lab manual and discussion materials. Use of other on-line course management systems are encouraged.

## **III. Student Learning Outcomes**

Upon successful completion of this course, students will be able to:

1.	Students will demonstrate scientific reasoning applied to the natural world, including: An understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling
2.	Application of scientific data, concepts, and models in one of the natural (or physical) sciences
3.	Demonstrate a proficiency in technical lab skills enabling them to function in a laboratory setting.

# IV. Tompkins Cortland Institutional Learning Outcomes; Program Learning Outcomes; SUNY General Education Competencies and Knowledge and Skills Areas

#### **Tompkins Cortland ILOs**

Complete this section for "service" courses only (e.g., courses that are required of all students; courses that are not program specific but satisfy liberal arts requirements; or commonly used in multiple academic programs to meet non-program-specific requirements). Check only Institutional Learning Outcomes (ILOs) that are meaningfully developed and assessed in this course. For each ILO chosen, include the SLO to which it aligns.

Students will:

Communicate effectively, in oral and written forms, taking into consideration audience and purpose.

Apply principles and methods of scientific inquiry and quantitative reasoning appropriate to their discipline.

Course SLO(s): Students will demonstrate scientific reasoning applied to the natural world, including• an understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling as assessed by lab reports, oral presentation, poster presentations.•

application of scientific data, concepts, and models in one of the natural (or physical) sciences as assessed by projects, practicums and/or solving case studies.

Use information, critical thinking, and the creative process to solve problems and reach conclusions.

Use technology appropriate to their discipline.

□ Describe the ways in which social, economic, or environmental sustainability depends on their own and the collective contributions of a diversity of ideas and people.

#### Program Learning Outcomes

Complete this section for program-specific courses (e.g., those that share the same discipline code as the academic program or satisfy requirements in related programs). List the academic program(s) here and note which Student Learning Outcomes align to specific Programmatic Learning Outcomes. Please see the MCS Instructions for more details.

Specify the Academic Program: Biotechnology Certificate.

Demonstrate a proficiency in technical lab skills enabling them to function in a laboratory setting. Apply methods of scientific inquiry and quantitative reasoning to investigate a hypothesis or solve a scientific problem.

#### **SUNY General Education Competencies**

If this course assesses a SUNY GEN ED Competency, check all that apply and indicate which course outcome(s) address each checked item:

CRITICAL THINKING & REASONING- Students will:

a. Identify, analyze, and evaluate ideas, data, and arguments as they occur in their own or others' work; acknowledge limitations such as perspective and bias; and

Course SLO(s):

#### □ INFORMATION LITERACY - Students will:

a. locate information effectively using tools appropriate to their need and discipline; evaluate information with an awareness of authority, validity, and bias; and demonstrate an understanding of the ethical dimensions of information use, creation, and dissemination.

Course SLO(s):

SUNY GENERAL EDUCATION KNOWLEDGE AND SKILLS AREA(s): Natural Sciences For courses that are approved to meet one (or more) of the ten SUNY General Education Knowledge and Skills Areas, indicate which area the course fulfills, and which outcome(s) are aligned with the SUNY outcomes for that area:

Course SLO(s): Students will demonstrate scientific reasoning applied to the natural world, including

1.	Describe the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling as assessed by lab reports, oral presentation, poster presentations.
2.	Apply scientific data, concepts, and models in one of the natural sciences as assessed by projects, practicums and/or solving case studies.

□ This course does not address any of the above Tompkins Cortland ILOs, PLOs, or SUNY General Education Competencies or Knowledge and Skills Areas.

## V. Essential Topics/Themes

1.	<b>History of Microbiology</b> : Discuss the discovery of microorganisms and their recognition as important agents of disease. Microorganisms and viruses, and other infectious particles.
2.	Scientific Method
3.	Staining and Classification of Microbes / Microscopy- simple stain, Gram stain, structure stains
4.	<b>Cell Structure and Function</b> of microorganisms: Differentiate the basic physiology, structure, genetics, and ecology between prokaryotic and eukaryotic
5.	<b>Microbial Genetics</b> , reproduction, and physiology of microorganisms: Describe the role of microorganisms in human health and immune responses.
6.	<b>Microbial Nutrition and Growth</b> Cultivate appropriate and safe laboratory techniques useful in the health profession
7.	<b>Controlling Microbial Growth</b> : Cultivate appropriate and safe laboratory techniques useful in the health profession
8.	<b>Immunology</b> Identify the interactions of molecules, cells, and organs of the immune system, as well as the genetic components of this system.
9.	Discuss mechanisms leading to drug resistance of microorganisms.
10.	<b>Epidemiology</b> of disease: Discuss various infectious diseases and implications/effects on the health of human populations.
11.	<b>Infectious diseases of the organ systems-</b> identify typical of bacteria, fungal and viral infections of the organ systems.
12.	Stimulate professional growth by keeping abreast of new developments in the study of microorganisms through journals and other pertinent resources
13.	Trends: emerging infectious diseases and bioterrorism

## VI. Methods of Assessment/Evaluation

Method	% Course Grade
Unit exams, covering several chapters; the last unit exam (or final) should be comprehensive and incorporate questions relating to all core concepts	25-35%
Final Exam	10-20%
Weekly quizzes on	15-20%
Case Studies	5-10%
Lab Notebook	5-10%

Identification of Unknown	10-20%
Laboratory Assignments	15-25%

### VII. Texts – 🛛 Required 🛛 🖾 Recommended 🔅 🖓 Used for more than one course (list courses)

High school instructors may consult with staff in the CollegeNow office for additional information and guidance.

	OER
1. <b>OpenStax: Microbiology. 2016</b> : <u>https://openstax.org/details/books/microbiology</u> ISBN:10:1- 938168-14-3	
2. <u>Microbiology with Diseases by Body System</u> , 5 <sup>th</sup> edition by Robert Bauman OR comparable text.	

Editions listed are current as of date of syllabus. More recent editions may be used.

#### VIII. Bibliography of Supplemental Materials

1.Centers for Disease	Control and Prevention, DPDx Website, Laboratory Identification of Parasites of Public
Health Concern, ht	tps://www.cdc.gov/dpdx/az.html
2.Centers for Disease	Control and Prevention, Fungal Infections, https://www.cdc.gov/fungal/features/fungal-
infections.html	

Editions listed are current as of date of syllabus. More recent editions may be used.

#### IX. Other Learning Resources

Audiovisual: video (YuJa) on lab notebook documentation of data

#### Electronic:

**Other:** The SUNY supported course management system (BrightSpace) is used to post the course syllabus, outline, course materials and related links. Including on-line quizzes, lab manual and discussion materials. Use of other on-line course management systems are encouraged.

**Credit/Contact Hour Relationship**: The State University of New York, like most of American higher education, has adopted a variant of the traditional "Carnegie Unit" as a measure of academic credit. This unit is known in the State University by the familiar term, "semester credit hour," and is the primary academic measure by which progress toward a degree is gauged. In the interest of accurate academic measurement and cross campus comparability, the following definitions and practices apply in controlling the relationship between contact and credit hours. A semester credit hour is normally granted for satisfactory completion of one 50-minute session of classroom instruction per week for a semester of not less than fifteen weeks. This basic measure may be adjusted proportionately to reflect modified academic calendars and formats of study. Semester credit hours are granted for various types of instruction.(SUNY Memorandum to Presidents, Vol. 76 #8, 1976)

Attendance Policy: To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161,

Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.

**Services for Students with Disabilities:** It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.

**Academic Integrity:** Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of their academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.

Any written work submitted by a student must be their own. If the student uses the words or ideas of someone else, they must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.

Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.