



Course Prefix/Number/Title: BIOL 202 – MICROBIOLOGY

Number of credits: 4

### Course Description:

This course is a survey of microbial cell biology, microbial genetics, and virology with an emphasis on human infectious disease.

Pre-/Co-requisites: BIOL 150 or higher

### Course Objectives:

Students will be introduced to the world of Microbiology. They will learn about the types of microbes, microbial genetics, diversity, microbe control and defenses. Students will understand the role of microbes in the ecosystem and the scientific and medical applications of microbes.

**Learning Objectives:** To develop a fundamental understanding of the basic principles of microbiology. Students will develop a working understanding of the structure, growth, nutrition, metabolism, genetics and diversity of prokaryotes, microscopic eukaryotes and virus. Students will become familiar with medical, agricultural, and other applied aspects of the field of microbiology.

**Instructor:** Angela Bartholomay

**Office Hours:** TBD **Phone:** (701)-228-5471

**Email:** [angela.bartholomay@dakotacollege.edu](mailto:angela.bartholomay@dakotacollege.edu) (preferred)

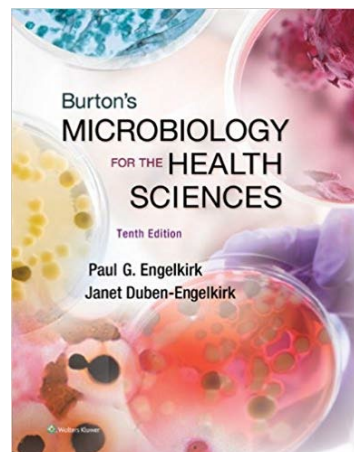
**Lecture Schedule:** TBD

**Lab Schedule:** TBD

**Lab Manual:** Blackboard shell

**Textbook(s):** Burton's Microbiology for the Health Sciences (Microbiology for the Health Sciences. Paperback by Paul G. Engelkirk and Janet Duben-Engelkirk. Tenth Edition.

ISBN- 978-1-4511-8632-1



**Course Requirements:** Grading is based on the percentage of total possible points you obtain. This course will have approximately 1000 points

14 quizzes (10-20 points each)

3 Exams (120 points each)

Laboratory and assignment (400 points). ,

Missed exam/work cannot be made up unless prior arrangements have been made and must be made up within the allotted time. All hands on labs require a photo of you doing your work that includes the date in the background in order for you to receive full credit.

Final letter grades are assigned based on the following criteria:

A = 89.5-100% of the total points

B = 79.5 - <89.5% of the total points

C = 69.5 - <79.5% of the total points

D = 59.5 - <69.5% of the total points

F = <59.5% of the total points

**General Education Competency/Goal # 1:** Identifies the interrelationships between humans and their environment.

LO 2: Demonstrates an understanding of the natural environment

LO 3: Applies scientific information in everyday life

### Relationship to Campus Focus/Theme

This course addresses the campus theme by incorporating the latest diagnostic procedures, treatments, and other technologies that are used to identify and treat human diseases and disorders.

### Classroom Policies

- 1) Be respectful of other students and the instructor
- 2) Due your best to turn work in on time. Due dates are set for midnight the Monday of the following week. All assignments from the 1<sup>st</sup> half of the semester will close at the end of spring break.

**Student Email Policy:** Dakota College at Bottineau is increasingly dependent upon email as an official form of communication. A student's campus-assigned email address will be the only one recognized by the campus for official mailings. The liability for missing or not acting upon important information conveyed via campus email rests with the student.

**Academic Integrity:** According to the DCB Student Handbook, students are responsible for submitting their own work. Students who cooperate on oral or written examinations or work without authorization share the responsibility for violation of academic principles, and the students are subject to disciplinary action even when one of the students is not enrolled in the course where the violation occurred. The Code detailed in the Academic Honesty/Dishonesty section of the Student Handbook will serve as the guideline for cases where cheating, plagiarism or other academic improprieties have occurred.

All students are expected to adhere to the highest standards of academic integrity. Dishonesty in the classroom or laboratory and with assignments, quizzes, and exams is a serious offense and is subject to disciplinary action by the instructor and college administration. For more information, refer to the Student Handbook.

**Disabilities and Special Needs:** Students with disabilities or special needs (academic or otherwise) are encouraged to contact the instructor and Disability Support Services.

If you have a disability for which you need accommodations, you are encouraged to contact your instructor and Erica Hamilton at 701-228-5672 to request disability support services as early as possible during the beginning of the semester.

**Title IX:** Dakota College at Bottineau (DCB) faculty are committed to helping create a safe learning environment for all students and for the College as a whole. Please be aware that all DCB employees (other than those designated as confidential resources such as advocates, counselors, clergy and healthcare providers) are required to report information about such discrimination and harassment to the College Title IX Coordinator. This means that if a student tells a faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the College's Title IX Coordinator. Students wishing to speak to a confidential employee who does not have this reporting responsibility can find a list of resources on the DCB Title IX webpage.

### **AI Student Policy:**

Unless otherwise indicated in the course syllabus, or in individual instructions for course assignments, or in the absence of the express consent of the course instructor, students are not allowed to utilize generative AI to help produce any of their academic work. Any violation of this policy will be considered an act of academic dishonesty as outlined within the Dakota College Code of Student Life.

#### **RESPONSIBILITIES**

|          |                                                                                                                                                                                                                                                                                                          |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Students | <ul style="list-style-type: none"><li>• Responsible for following the syllabus and assignment instructions regarding use of generative AI for all academic work.</li><li>• Obtain permission of the instructor prior to the use of generative AI that is outside of the syllabus or assignment</li></ul> |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <p>instructions. Provide appropriate rationale for how the use of generative AI will enhance the learning experience for the assignment.</p> <ul style="list-style-type: none"> <li>• In instances where generative AI is permissible, appropriately cite the generative AI program used and indicate where in the assignment it was used, in a brief submission statement.</li> </ul>                                                                                                                                                                                                       |
| Faculty | <ul style="list-style-type: none"> <li>• Determine if the use of generative AI could enhance student learning in any assignment of project.</li> <li>• Clearly indicate in all course syllabi if generative AI is allowable for any academic work.</li> <li>• If allowable, give specific parameters for how and when generative AI may be used.</li> <li>• If a violation of generative AI for the individual course/syllabus is suspected, discuss the concern with the student. If violation is still suspected, inform the appropriate semester coordinator/program director.</li> </ul> |

## Microbiology BIOL 202\_SCHEDULE

| <b>Timeline</b> | <b>Topic</b>                                                                     | <b>Text</b> |
|-----------------|----------------------------------------------------------------------------------|-------------|
| Week 1          | Introduction to Microbiology and Viewing the Microbial World                     | Ch 1, 2     |
| Week 2          | Cell Structure and Taxonomy                                                      | Ch 3        |
| Week 3          | Microbial Diversity: Acellular and Prokaryotes                                   | Ch 4        |
| Week 4          | Microbial Diversity: Eukaryotic Microbes                                         | Ch 5        |
| Week 5          | Biochemical Basis of Life                                                        | Ch 6        |
| Week 6          | Microbial Physiology and Genetics                                                | Ch 7        |
| Week 7          | Controlling Microbial Growth In Vitro                                            | Ch 8        |
| Week 8          | Inhibiting the Growth of Pathogens In Vivo using Antimicrobial Agents            | Ch 9        |
| Week 9          | Microbial Ecology and Microbial Biotechnology and Epidemiology and Public Health | Ch 10, 11   |
|                 |                                                                                  |             |
| Week 10         | Pathogenesis of Infectious Diseases                                              | Ch 14       |
| Week 11         | Nonspecific Host Defense Mechanisms                                              | Ch 15       |
| Week 12         | Specific Host Defense Mechanisms: An Introduction to Immunology                  | Ch 16       |
| Week 13         | Overview of Human Infectious Diseases and Viral Infections of Humans             | Ch 17 & 18  |
| Week 14         | Bacterial Infections of Humans                                                   | Ch 19       |
| Week 15         | Fungal Infections of Humans                                                      | Ch 20       |

| <b>Timeline</b> | <b>Topic</b>                   | <b>Text</b> |
|-----------------|--------------------------------|-------------|
| Week 16         | Parasitic Infections of Humans | Ch 21       |
| Finals Week     | Final Exam                     |             |

## Tentative Course and Lab Outline:

### Week 1:

- Reading: Introduction to Microbiology (Ch 1) and Viewing the Microbial World (Ch 2)
- Labs (30 pts): Microbiology-Rules for Success
- Quiz (20 pts): Ch. 1 & Ch. 2

### Week 2:

- Reading: Cell Structure and Taxonomy (Ch 3)
- Begin Lab: Microorganisms, Aseptic techniques, and Cultures
- Quiz (20 pts): Ch. 3

### Week 3:

- Reading: Microbial Diversity: Acellular and Prokaryotes (Ch 4)
- Lab Due (30 pts): Microorganisms, Aseptic techniques, and Cultures
- Quiz (20 pts): Ch. 4

### Week 4:

- Reading: Microbial Diversity: Eukaryotic Microbes (Ch 5)
- Begin Lab: Bacterial Morphology and Staining Techniques
- Quiz (20 pts): Ch. 5, Exam Chapters #1-5

### Week 5:

- Exam Chapters #1-5 part I and II
- Reading: Tissue Biochemical Basis of Life (Ch 6)
- Lab Due (30 pts): Bacterial Morphology and Staining Techniques
- Quiz (20 pts): Ch. 6

### Week 6:

- Reading: Microbial Physiology and Genetics (Ch 7)
- Quiz (20 pts): Ch. 7

### Week 7:

- Reading: Controlling Microbial Growth In Vitro (Ch 8)
- Lab Due (30 pts): Enumeration, Dilution, and Plate Counts
- Quiz (20 pts): Ch. 8

### Week 8:

- Reading: Inhibiting the Growth of Pathogens In Vivo using Antimicrobial Agents (Ch 9)
- Lab (30 pts): Kirby-Bauer Diffusion for Antibiotic Effectiveness

### Week 9:

- Reading: Microbial Ecology (Ch 10) and Microbial Biotechnology and Epidemiology and Public Health (Ch 11)
- Quiz (20 pts): Ch. 10 & Ch. 11
- Midterm (100 pts) Chapters #6-10 Part I and II

### Week 10:

- Reading: Pathogenesis of Infectious Diseases (Ch.14)

- Lab (30 pts): Hand-washing and Normal Flora
- Quiz (20 pts): Ch. 14
- Week 11:
  - Reading: Nonspecific Host Defense Mechanisms (Ch.15)
  - Begin Lab: Food Safety
  - Quiz (20 pts): Ch. 15
  - Exam Chapters # 11-15
- Week 12:
  - Reading: Specific Host Defense Mechanisms: An Introduction to Immunology (Ch.16)
  - Lab Due (30 pts): Food Safety
  - Quiz (20 pts): Ch. 16
- Week 13:
  - Reading: Overview of Human Infectious Diseases (Ch 17) and Viral Infections of Humans (Ch 18)
  - Begin Lab: Environmental Influences on Microbial Growth-Salinity Testing
  - Quiz (20 pts): Ch. 17 & Ch. 18
- Week 14:
  - Reading: Bacterial Infections of Humans (Ch.19)
  - Lab Due (30 pts): Environmental Influences on Microbial Growth-Salinity Testing
  - Quiz (20 pts): Ch. 19
- Week 15:
  - Reading: Fungal Infections of Humans (Ch.20)
  - Lab (30 pts): Microorganisms as Vector of Diseases
  - Quiz (20 pts): Ch. 20
- Week 16:
  - Reading: Parasitic Infections of Humans (Ch.21)
  - Assignment (40 pts): TBD
  - Quiz (20 pts): Ch. 21
- Week 17:
  - Final (150 pts): Chapters #16-21