BALL STATE UNIVERSITY
DEPARTMENT OF BIOLOGY
SYLLABUS – Fall 2025

Course Number: **BIO 113** **Credit Hours: 5**

Lecture Instructor: Dr. Douglas Bernstein (Doug)
E-mail: dabernstein**@bsu.edu**
Office: FSB 412
Office Hours: **Wednesday 9-10 and Friday 9-10 or by appointment** – FSB 412
This course will use **CANVAS** for all updates, notes, and assignments. If you come by to see me in my office and have not spoken with me ahead of time to say you are coming by.

Class Meets: M, W and F Foundational Science Building FSB 142 10-10:50

Lab Instructor: _____

Lab Time: _____; FSB 259

Please contact me with any questions or concerns you have regarding this course as soon as possible. The most effective means of contacting me quickly is via e-mail as I ***generally*** receive and can respond to queries within 24 h. Sometimes messages can get sent to my clutter folder so if I do not respond within 24 hours, please email me again. I encourage you to come ask questions or discuss concerns during scheduled office hours or make an appointment for an alternative time. Feel free to stop by anytime and if I am available, I would be happy to talk with you. In addition, I will plan on getting to lecture ~5-10 minutes before it begins and will try to stay 5-10 minutes after class, provided no other immediate obligations to answer questions.

I. TITLE: Microbiology for the Allied Health Sciences

II. REQUIRED TEXT, RESOURCES AND MATERIALS:

a. **Lecture Text:** Microbiology with Diseases by Body System. 5th Edition. RW Bauman. Benjamin Cummings (Pearson). ISBN: 9780134607900
Textbook should be brought to every lecture class.
b. 113 Labs will be provided on Canvas

Note: Substituting earlier editions or alternative texts for either the lecture text or laboratory manual is not recommended. E-text may be used if preferred for the lecture text.

c. **Modified Mastering Microbiology:** access (can be purchased ONLY from student bookstores or from the Pearson publisher – **DO NOT purchase online**). Mastering Microbiology should be accessed ONLY through the course CANVAS site. ISBN 9780134607900 This is the number for the E text and the modified mastering combo if you get this you do not need a separate textbook.
d. Supplemental materials may also be available in the Science Library (in FSB) and on CANVAS.
e. YOU WILL NEED A WORKING COMPUTER THAT CAN CONNECT TO THE BALL STATE WIFI FOR THIS CLASS TO TAKE THE EXAMS IN CLASS. A PHONE WILL NOT BE SUFFICIENT TO DO THE WORK REQUIRED FOR THIS CLASS.

III. PREREQUISITES: None, however at least a moderate interest in microbiology and medicine will make this course much more enjoyable for both of us.

IV. CATALOG DESCRIPTION:
Introductory course for students in applied health curricula. Presents biomolecules, enzyme interaction/function, physiology, and structure of representative microorganisms. Emphasizes bacteria, viruses, fungi, and protozoa of health significance and the host-microbe relationship. Microbiological techniques will be emphasized in laboratory.

III. COURSE RATIONALE
Bio 113 is designed primarily for students in applied health curricula. As such, Bio 113 aims to expose and teach students basic microbiological principles they will encounter in medical setting and apply these principles. **Three themes will be carried through the course 1) The microbe must encounter the host and enter the host, 2) The microbe will multiply despite the host's defenses 3) The microbe can cause damage to the host.** Basic microbiological concepts will be taught via clinical case studies using problem-based learning techniques. The diversity of microbiota and microbial metabolism, growth and control are all fundamental concepts bridging basic microbiology and clinical practice and will be explored as such. Students will practice basic laboratory protocols and techniques for identifying clinically-relevant microbiota and design strategies for identifying unknown pathogens. This course will begin to prepare students both academically and emotionally for the experiences they may encounter in the clinic or workplace.

IV. COURSE OBJECTIVES:
This course has been designed to provide allied health science majors with an overview of the fundamental techniques and concepts of modern microbiology. Students will gain an understanding of the fundamentals of microbiology, essential critical thinking skills for application of microbiological concepts, and tools for utilizing microbiological techniques within the medical field. At the completion of the course, the student will be able to:

- Evaluate and critique the biological definition of life.
- Explore the diversity of microbiota.
- Compare and contrast biological structure and function among taxa.
- Derive the broad principles which unify all life.
- Recognize basic microbiological etymology.
- Evaluate physiological and biochemical differences between organisms.
- Understand basic environmental and physiological parameters that affect the growth of microorganisms.
- Describe basic chemical reactions and cite the role of key compounds in cellular respiration and fermentation.
- Describe microbial reproduction, characteristics of DNA, process of transcription, translation, mutation.
- Apply and encourage the principles of laboratory and clinical health safety, including Universal Precautions
- Relate laboratory test results to common disease processes by recognizing the principles and methodologies practiced.
- Culture, identify, and differentiate prominent clinical microbiological specimens.
- Design a series of clinical tests to identify an unknown clinical bacterium.

- Recognize factors that affect methods and test results and take appropriate actions within established guidelines using the skills of critical thinking and problem solving.
- Predict susceptibility of individuals and populations to disease
- Synthesize biological, clinical, and socioeconomic properties influential in epidemiology.
- Critique antimicrobial therapy and immunizations (limitations, reasons for success and failure)
- Critique types of sterilization and disinfection methods and associated principles of infection control
- Enumerate bacteria found in natural ecosystems and assess their effect on the quality of the environment.
- Discuss microbial pathogenesis and describe microbes of medical importance.
- **Develop basic scientific writing/communication skills!**

V. CONTENT OUTLINE:

Below is a **TENTATIVE** lecture schedule including general topics, likely exam dates, and corresponding **REQUIRED** reading material from course textbook. Additional required and suggested readings may be provided. The exams will cover all material presented after the previous exam. While exams are not cumulative, it is expected that you will know the material and can apply material from the previous exams to subsequent exams.

week	Date	Lecture Topics	Textbook Chapters	Weekly Homework Due Date	Homework Topics	Weekly Exam Topics	Exam Dates
week	Date	Lecture Topic/s	Texbook Chapters	Weekly Homework Due Date	Homework Topic	Exam Topic	Exam Date Estimates
1	18-Aug	Microbiology History and Methods	1,4	11:59 PM Saturday 8/23/25	1,4		
2	25-Aug	Cell Structure and Function	2,3	11:59 PM Saturday 8/30/25	2,3	Chapters 1-4	Exam 1 9/3/2025
3	1-Sep	Microbial Nutrition	6	11:59 PM Saturday 9/6/25	6		
4	8-Sep	Microbial Metabolism	5	11:59 PM Saturday 9/13/25	5	Chapter 5 and 6	Exam 2 9/17/2025
5	15-Sep	Microbial Genetics/Central Dogma	7	11:59 PM Saturday 9/20/25	7		
6	22-Sep	Viruses	13	11:59 PM Saturday 9/27/25	13		
7	29-Sep	Microbial Control- Body	10	11:59 PM Saturday 10/4/25	10	Chapter 7,13, and 10	Exam 3 10/3/2025
		Fall Break Monday+Tuesday 10/6-10/7					
8	8-Oct	Microbial Control-Environment	9	11:59 PM Saturday 10/11/25	9		
9	13-Oct	Infection, Infectious Disease and Epidemiology	14	11:59 PM Saturday 10/19/25	14		
10	20-Oct	Innate Immunity	15	11:59 PM Saturday 10/25/25	15	Chapter 9,14, and 15	Exam 4 10/22/2025
11	27-Oct	Adaptive Immunity	16	11:59 PM Saturday 11/1/25	16		
12	3-Nov	Immunization, immune disorders	17,18	11:59 PM Saturday 11/8/25	17,18		
13	10-Nov	Diseases of the Skin and Nervous System	19,20 Case Studies	11:59 PM Saturday 11/15/25	19,20 Case Studies	Chapters 16,17, and 18	Exam 5 11/14/2025
14	17-Nov	Cardiovascular and Respriatory Diseases	21, 22 Case Studies	11:59 PM Saturday 11/22/25	21, 22 Case Studies		
		Thanks Giving Break 11/26-11/30					
16	1-Dec	Digestive and Genitourinary Diseases	23, 24 Case Studies	11:59 PM Saturday 12/6/25	23, 24 Case Studies	Chapters 19,20,21,22,23,24	Exam 6 12/5/2025
17	9-Dec	Finals Week					

VI. INSTRUCTIONAL ACTIVITIES:

This course will utilize several instructional techniques including lecture, group activities, and laboratory experimentation. Instruction may also include self- and peer-graded activities. ***Regular class participation is essential to all aspects of this course!***

- **Statement of Instructor Responsibilities** – Instructors have the responsibility to *facilitate* student learning. As an instructor, I am responsible for ensuring students are familiar with course objectives and grading procedures; creating an environment conducive to meeting course objectives; preparing lecture materials and conducting lecture within class time; providing challenging and intellectually stimulating lecture content; informing students of resources to aid in meeting course objectives; grading assignments and exams in a timely and equitable manner; being available for student consultation; and responding to student questions and concerns in a timely manner. As an instructor, I will address your concerns and questions professionally at all times.

- **Statement of Student Responsibilities** – Students have responsibility for the development of their education and are accountable for all choices and actions. As a student, you are responsible for reviewing, understanding, and abiding by course and university guidelines; attending class regularly for the full period; engaging in discussions and activities; exhibiting non-disruptive classroom behavior; securing and turning off all electronic communications and entertainment devices during class (any use of a cell phone or other unauthorized electronic device may lead to an accusation of academic misconduct); refraining from use of laptops for any purpose other than class-related activities during class time; completing all coursework on time; taking scheduled exams; addressing conflicts or absences with the instructor as soon as possible in accordance with course policies; reviewing all graded material; registering disabilities with appropriate university office(s); notifying instructor of disabilities; and, ***discussing any concerns or questions regarding the course with the course instructor as soon as possible.*** Students should recognize that all coursework and interactions with instructors (whether verbal, e-mail, written, etc.) are professional activities and act accordingly.

VII. RESOURCES:

Course resources include the listed lecture text with supplemental materials and laboratory manual. Additional resources may be available via the course website on CANVAS including lecture notes, exam review materials, and study aids. Ball State University has multiple resources available for aiding students in courses via individual and group tutoring, informal course study sessions, and specialized equipment. Contact BSU Student Services for additional information.

VIII. GRADING PROCEDURES:

1.	**Lecture Participation**	60	**~30 lectures x 2**
2.	**6 Lecture Exams** (50 pts each)	300	
3.	**Weekly Mastering Homework** (15 pts each)	225	
4.	**4 Laboratory Quizzes** (30 pts each)	120	
5.	**PreLab Questions (**30 pts total**)**	30	**~30 meetings x 1**
6.	**4 Laboratory Reports** (25 points each)	100	
7.	**Public Service Announcement**	35	
8.	**Comprehensive Laboratory Final**	60	
9.	**Final Exam**	70	

1. **Lecture Participation**
   Most class periods will have a 10 minute section when you will work on questions with a group. These will be handed in online during class. I will choose randomly students to present their answers. Working as a group and answering these questions will earn you 2 points. Failure to hand in questions online will result in 0 points. Everyone must hand in their own answers. It is important for you not only to find the correct answer for these problems but also determine why alternative choices are incorrect. This type of problem solving will be important for the weekly quizzes. Please get my attention if you would like me to come to your group next to discuss a problem. A **collegial** and **professional** environment is expected at all times during group work. You must be in class to get credit for these questions.

2. **Lecture Exams (50 pts each)**
   Lecture exams will be administered in class online and will have a paper portion that needs to be turned in. There will be 6 exams throughout the semester. You must be present in class to take the exams. If you take the exam at home, you will be given a zero on the exam. If you get to class late you will have less time to take the exam. Exams will focus on the application of learned material. Exams will be multiple choice and will have a paper portion that needs to be turned in. Exams will cover material from both lecture and required reading and homework. Unless alternative arrangements are needed and discussed with the instructor, **exams must be completed within the allotted time period. See the course schedule for when exams will be. This schedule may change dependent upon instructor discretion.** If students need accommodations for disabilities to ensure success on lecture exams, please contact the disabilities office as soon as possible.

3. **Weekly Mastering Microbiology Homework (15 pts each)**
   All of the homework you do in this course will be done through Mastering Microbiology which should be accessed ONLY through the course CANVAS tab. Mastering Microbiology registration instructions are located in a file on CANVAS (under the syllabus tab). Please follow these instructions carefully. By doing weekly assignments, you will stay more up to date with the course material, and should do better in the course. Each assignment will cover the required chapter/s on the syllabus you will read for that week. Outside of questions about the material or points awarded, **all other questions should be referred to the Mastering Technical Support staff** which is linked on the Mastering tab in CANVAS. Each week, homework must be completed by 11:59 pm Saturday. **Homework cannot be made up**!

   Mastering Biology Grading Policy:
   - There are 6 number of answer attempts per question allotted.
   - You gain credit for correctly answering a question directly or through a hint. You also gain credit for not opening a hint. Hints are helpful clues or simpler questions that guide you to the answer. Hints are not available for all questions.
   - You lose credit for exhausting all attempts or giving up on a question and not answering.
   - If other words, guessing is not beneficial unless you have no idea on a question.

4. **Laboratory Quizzes (30 pts each)**
   Laboratory quizzes will be given at the beginning of the lab session at dates specified in the schedule. Quizzes will be timed (15 minutes) and consist of multiple choice, fill-in-the blank, and short-answer questions regarding lab material from the manual and in-class activities. As with other assignments, lab quizzes cannot be made-up if missed. If students need accommodations for disabilities to ensure success on lab quizzes please contact your lab instructor as soon as possible.

5. **PreLab Questions (30 pts total)**
   Every week 3-5 prelab questions found in the lab manual at the beginning of each lab will be due at the beginning of class. These questions must be handed in as you enter the classroom and are given to make sure that you read the lab before coming to class.

6. **Laboratory Reports (25 pts each)**

Laboratory reports will be collected randomly 4 times during the semesters. Students will not be informed of which lab reports will be collected. Lab reports consist of the questions and results described in your lab manual. Lab reports should be completed by the following lab meeting and can be collected at any time for grading.

7. **Public Service Announcement (35 pts each)**
   During your laboratory meeting, students will develop and present a public service announcement for a specific disease of clinical relevance. Additional details can be found in your laboratory manual and dates are listed in the laboratory schedule.

8. **Comprehensive Laboratory Final (60 pts)**
   On the last day of your laboratory section, a written comprehensive laboratory final exam will be completed to assess knowledge and application of laboratory concepts. A study guide will be provided ~ 1 month prior to the laboratory final.

9. **Lecture Final Exam (70 pts)**
   A written comprehensive final exam will be given during the lecture final exam period. A study guide will be provided ~ 1 month prior to the final exam. The final exam will consist of short-answer questions covering broad concepts discussed through the semester.

10. **Getting to know you assignment (Extra Credit) (10 pts)**
    This will be worth 10 extra credit points. It will allow me to get to know you, why you are taking the course, and show you where my office is. This will be posted on CANVAS.

We will adhere to the fixed grading scale, total points available are 1000 without extra credit.

A = 940-1000 pts	C = 740-769 pts
A- = 900-939 pts	C- = 700-739 pts
B+= 870-899 pts	D+ = 670-699 pts
B = 830-869 pts	D = 630-669 pts
B- = 800-829 pts	D- = 600-629 pts
C+= 770-799 pts	F = 0-599 pts

IX. ATTENDANCE POLICY:

You are required to attend both lecture and laboratory on time. This course will adhere to the policy published in the BSU Code of Student Rights & Responsibilities. Regular attendance is essential to succeeding in this course. Students are solely responsible for materials covered during any absence and should contact the instructor regarding absence.

Missed Exams/Quizzes/Participation: The instructor must be notified **in advance** of the examination period if an exam is to be missed. Any make-ups are at the discretion of the instructor and on presentation of a documented excuse satisfactory to the course instructor. Please do not miss exams!

Late Assignments: A zero tolerance policy is in place for late assignments. No assignments will be accepted past the designated due date. Note that assignments are due on Saturday at midnight. I will leave the homework up until the exam so people can use it to study but you will not get credit if you do not hand it in by the due date. Only doctors notes documenting a illness will be accepted. If you have an issue with an assignment not showing up on CANVAS contact me within **48 hours**.

Vacations and work are not excuses for missing assignments. If you are an NCAA athlete or have other university related schedule issues please come to me to discuss any schedule issues.

LABORATORY EXPERIENCE:
Laboratory activities are designed to augment lecture materials and provide hands-on application of topics. **Unexcused missed laboratory session will result in deduction of 2 points per missed lab on your laboratory final exam**. If you miss lab, you will not receive credit for the prelab questions. In addition, labs cannot be made up and you must attend the lab section you are scheduled for. If you miss a lab and a lab report is collected, you cannot hand in this report at a later date. Your laboratory grades will be determined by your laboratory instructor and incorporated into your final course grade. Laboratory questions and concerns should first be directed to your laboratory instructor, followed by the lecture instructor. Generally, your lecture instructor is not involved directly with your laboratory activities.
LABORATORY ATTIRE:
Labs will begin meeting the first week of class at the scheduled time. Beginning the second lab meeting, all students must wear appropriate attire or be dismissed from class on that day. Appropriate attire for laboratory activities to ensure safety includes closed-toed shoes, long pants or skirts, minimal jewelry, and long hair tied back.

X. ACADEMIC HONESTY POLICY:
Honesty, trust, and personal responsibility are fundamental attributes of the university community. Academic dishonesty and other forms of academic misconduct threaten the foundation of an institution dedicated to the pursuit of knowledge and will not be tolerated. To maintain its credibility and reputation, and to equitably assign evaluations of scholastic and creative performance, Ball State University is committed to maintaining a climate that upholds and values the highest standards of academic integrity. Visit the VPAA's academic integrity website (Students tab) for resources on understanding academic integrity, citing sources properly, and avoiding inadvertent academic dishonesty. To learn about BSU's academic integrity expectations and students' rights, please read the University Student Academic Ethics Policy.

Academic integrity violations include giving or receiving an unfair academic advantage (cheating), presenting someone else's ideas or work as your own (plagiarism), and falsifying academic records. Unless otherwise indicated, you must work independently by yourself. Check with me if you are unsure whether something constitutes academic dishonesty. Examples of academic integrity violations include but are not limited to:

- *Using resources not authorized by the faculty member (including devices, AI tools, hidden notes, and open books)*
- *Using commercial study websites to find answers to graded assignments (Chegg, Course Hero, StudyPool, OneClass, etc.).*
- *Without the instructor's written permission, giving away, buying, or selling graded assignments class notes, exams, study guides, or other course materials to other students or to third-party vendors (Course Hero, Chegg, 24HourAnswers, etc.).*
- *Working with another person on any assignment other than authorized group projects.*

- *Sharing or allowing others to access your files, whether done with permission or not.*
- *Reusing your own work from another semester, course, or section.*
- *Sharing answers with others during exams (passing notes, texting, whispering, gesturing)*
- *Discussing exam questions and answers with students who have not taken the exam.*
- *Soliciting others to complete work for you.*

AI Use: For assignments done in class such as quizzes and exams the use of AI will not be permitted. For assignments to be done at home such as lab reports and presentations AI can be used to brainstorm and revise text. However all assignments will have word, sentence, or time limits and failure to abide by these limits will result in lower grades.

XI. University Statement

We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse. If you need course adaptations or accommodations because of a disability, please contact the instructor of record as soon as possible. Ball State's *Disability Services* office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or *dsd@bsu.edu*.

Freedom of Expression: In this course, we are committed to fostering a learning environment that values intellectual diversity, encourages free expression, and promotes open inquiry. As members of the Ball State Community, we treat each person in the Ball State community with civility, courtesy, compassion, and dignity and respect and learn from differences in people, ideas, and opinions. Please review Ball State University's Statement on Freedom of Expression, the resources on Ball State's Freedom of Expression webpage, and Ball State's Beneficence Pledge.

Title IX: Ball State University is committed to providing a safe and inclusive learning environment for all students. If you or someone you know has experienced sexual harassment—including sexual assault, dating violence, domestic violence, or stalking, please know that you are not alone. The University offers support services and resources. For more information or to report an incident, please visit bsu.edu/titleix or contact the Title IX Coordinator at 765-285-1545 or at titleix@bsu.edu.

XII. FERPA: The Family Educational Rights and Privacy Act insures the security and confidentiality of your student information, including your grades. As you are adults, I am not allowed to discuss your performance in this course with anyone outside of the University without your explicit written permission.

XIII. Course Withdrawals: You have until **10/27/2025** to withdraw from this course. After that date, a late withdrawal is only allowed with permission and documentation of significant extenuating circumstances.

XIV. Incompletes: An incomplete grade is only given when course work cannot be finished at the end of the semester, such as the final exam, for a documentable reason. All previous grades in the course are retained and a final course grade is given once the work is made-up. This grade is **NOT** a way to retake the class.

XV. Tips for Success:

- Develop a regular weekly routine of completing homework and exams.
- Complete any available extra credit assignments.
- Review the weekly study guides to assist you on exams.
- Read your book, work the problems in the back of the chapters, a copy is on reserve in the Science Library
- When studying, focus on the concept first and then work your way down to the details
- Do all activities at the end of each chapter and check answers in the Appendix
- Use the activities at the MasteringMicrobiology study center to review
- Re-do Mastering homework assignments for practice, this will not affect your grade
- Ask for help - the earlier the better! I am happy to meet with students outside of class time on a weekly basis or whenever is needed. Large classes can be difficult to get one-on-one help – come see me as much as you need!
- Use the Bio 113 tutoring in the Learning Center or tutoring online through Mastering
- Take advantage of sessions in the Learning Center on study strategies and the supplemental instruction with the SI leader.
- **Please come see me if you are not doing as well as you would like!!!!!!!!!! I can't help if you don't come see me!!!!!!**

BIO 113 Tentative Laboratory Schedule

Please read corresponding lab manual pages prior to attending lab

Supplemental readings will be posted on CANVAS and/or provided in the Science Library

		Biology 113 Schedule of Laboratory Activities Fall 2025	
Week	Monday of the Week	Lab Number	Topic
1	18-Aug	Lab 1	Universal Precautions in Action, Specimen Transport
1	18-Aug	Lab 2	Microscopy Care and Use of Microscope
2	25-Aug	Lab 3	Cultivation of Microbes; Microbes in the Environment and Skin
2	25-Aug	Lab 4	Isolation of Bacteria by Dilution Techniques
3	1-Sep	Lab 5	Gram Stain
3	1-Sep	Lab 6	Acid Fast and Structural Staining
4	8-Sep	Lab 7	Morphological Unkown
4	8-Sep	Lab 8	Lab Quiz #1 Microbial Growth; Differential, Selective and Enriched Media
5	15-Sep	Lab 9	Microbial Metabolism; Carbohydrate Metabolism
5	15-Sep	Lab 10	Bacterial Transformation
6	22-Sep	Lab 11	Ames Test and UV radiation induced mutation
6	22-Sep	Lab 12	Phone Soap Lab
7	29-Sep	Lab 13	Lab Quiz #2 Control of Microbial Growth; Physical Methods
7	29-Sep	Lab 14	Chemical Methods of Control; Disinfects and Antiseptics
8	6-Oct		Fall Break No Lab
8	6-Oct		Fall Break No Lab
9	13-Oct	Lab 15	Antimicrobial Drugs and Difference between Fungi and Bacteria
9	13-Oct	Lab 16	Water Contamination
10	20-Oct	Lab 17	Genus Identification of Unknown Bacterial Cultures
10	20-Oct	Lab 18	Genus Identification of Unknown Bacterial Cultures
11	27-Oct	Lab 19	Epidemiology how a cold spreads through a dorm
11	27-Oct	Lab 20	Lab Quiz #3; Innate Immunity
12	3-Nov	Lab 21	Blood Typing: ABO and Rh Blood Group Systems
12	3-Nov	Lab 22	Strep Test/White Blood Cell Identification
13	10-Nov	Lab 23	Public Service Announcement
13	10-Nov	Lab 24	Bacteria of the Gastrointestinal Tract
14	17-Nov	Lab 25	Lab Quiz #4 Bacteria of the Gastrointestinal Tract/Genitourinary Tract
14	17-Nov	Lab 26	PSA Presentations
15	24-Nov		Thanksgiving Break
15	24-Nov		Thanksgiving Break
16	1-Dec	Lab 27	PSA Presentations if needed Review for Lab Final
16	1-Dec	Lab 28	Lab Final Exam during regular lab time!