
Term Information

Effective Term Autumn 2023

General Information

Course Bulletin Listing/Subject Area Microbiology
Fiscal Unit/Academic Org Microbiology - D0350
College/Academic Group Arts and Sciences
Level/Career Undergraduate
Course Number/Catalog 4010
Course Title Foundations of Microbiology and Human Health
Transcript Abbreviation MicroHumanHealth
Course Description This human health focused class covers microbial metabolism and diversity, microbial genetics, and anti-microbial approaches. The impact of microbes on human health is explored through discussions about antibiotic resistant bacteria, pathogen emergence and re-emergence, host-microbe interactions, microbiome, immune responses, pathogenesis, vaccines, and epidemiology.
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 14 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Lecture
Grade Roster Component Lecture
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites 3 credit hours in college-level Biology
Exclusions None.
Electronically Enforced Yes

Cross-Listings

Cross-Listings None.

Subject/CIP Code

Subject/CIP Code 26.0502
Subsidy Level Baccalaureate Course
Intended Rank Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Describe the basic morphology and structure of bacteria, their growth requirements, and how they adapt and reproduce.
- Explain how environmental factors affect growth of microbes.
- Understand the diversity of bacterial metabolism and how it is relevant in infectious diseases.
- Discuss bacterial genetics with emphasis on mutations and bacterial gene transfer: the two mechanisms responsible for spread of antibiotic resistance as well as emergence of new strains of pathogens.
- Describe the basic morphology of viruses, how they reproduce and cause diseases.
- Explain various ways to control the growth of microbes.
- Describe the system of natural or innate immunity and how it provides protection.
- Describe adaptive immunity; understand how it is acquired, how it protects us, and how vaccines work.
- Elucidate microbial mechanisms to overcome the host body's immune mechanisms and establish successful infections.
- Understand how microbes are transmitted. Explain infection and disease control using preventative techniques to limit the spread of microbes.
- Describe some of the normal microbiota of the nose, mouth, skin, and digestive system.
- Describe microbial diseases of various human systems with emphasis on etiological agent, pathogenesis, symptoms, transmission, and treatment

Content Topic List

- Introduction to Microbiology: Types of Microbes and characteristics
- Bacterial morphology, cell structure
- Microbial Metabolism
- Microbial Growth
- Microbial Genetics
- Viruses, Viroids, and Prions
- Control of Microbial Growth
- Antimicrobial Drugs
- Innate Immunity
- Adaptive Immunity
- Epidemiology
- Host-Microbe interactions
- Infectious diseases

Sought Concurrence

No

Attachments

- Microbiology4010_Coverletter_Dec2023.pdf
(Cover Letter. Owner: Kwiek, Jesse John)
- Syllabus_Micro4010v2.pdf
(Syllabus. Owner: Kwiek, Jesse John)

Comments

- This course will not count towards the microbiology major (not even as an elective). *(by Kwiek, Jesse John on 12/13/2022 02:25 PM)*
- If this course will be able to count in your major (even as an elective), please provide an updated curriculum map. *(by Vankeerbergen, Bernadette Chantal on 12/13/2022 02:18 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Kwiek, Jesse John	12/13/2022 12:39 PM	Submitted for Approval
Approved	Kwiek, Jesse John	12/13/2022 12:39 PM	Unit Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	12/13/2022 02:18 PM	College Approval
Submitted	Kwiek, Jesse John	12/13/2022 02:25 PM	Submitted for Approval
Approved	Kwiek, Jesse John	12/13/2022 02:26 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	01/17/2023 02:54 PM	College Approval
Pending Approval	Cody, Emily Kathryn Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	01/17/2023 02:54 PM	ASCCAO Approval



13 December 2022

RE: New Course Proposal: Microbiology 4010

Dear Colleagues,

We propose a new lecture course, **Microbiology 4010: Foundations of Microbiology and Human Health**, a 3.0 credit course that focuses on the intersection of microbiology and human health. This new course came about through a multi-year discussion with the college of Nursing in response to stakeholder feedback that a more integrated approach was needed so nurses can apply the concepts from microbiology in clinical application. This course will be a required course in the new Bachelor of Science (BSN) in Nursing curriculum that commences in Autumn 2023.

Currently nursing students take General Microbiology 4000, which covers a wider range of microbiology concepts. The proposed course has a health science focus and the microbiological concepts from this course have been mapped throughout the new BSN curriculum. According to Dr. Bowles, "OSU will be the first in the nation to implement this thoughtful and integrative type of framework in nursing." Although in its first offering this new course will only be offered to BSN students (~160 students), in subsequent years we will increase enrollment to allow non-nursing students to also take the course.

We thank you for your consideration.

Regards,

Jesse J. Kwiek
Professor
Vice Chair for Teaching & Undergraduate Affairs
Department of Microbiology
Ohio State University
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484 West 12th Avenue
Columbus, OH 43210
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Microbiology 4010
Foundations of Microbiology and Human Health
Autumn 2023
The Ohio State University
3 Credit Hours

Course Description

Prerequisite: 3 credit hours in college-level Biology

Day/Time: TBD

This human health focused microbiology course covers bacterial structure, anti-microbial approaches, microbial metabolism, diversity, and genetics. The microbial impact on human health is explored through discussions about antibiotic resistance, pathogen emergence and re-emergence, host-microbe interactions, human microbiome, immune responses, pathogenesis, vaccines, and infectious diseases.

Instructor Information

Instructor: Dr. Madhura Pradhan
Email: pradhan.2@osu.edu
Phone number: 614-292-1196
Office: 372 Biological Sciences Building, 484 W 12th Ave
Office Hours: TBD

Materials Needed

Textbook: 'Microbiology Fundamentals: A Clinical Approach, 3rd ed. by Marjorie Kelly Cowan and Heidi Smith, McGraw Hill Publ. Co
(E-Textbook with online Access)

By the end of this course, students should successfully be able to:

1. Describe the basic morphology and structure of bacteria, their growth requirements, and how they adapt and reproduce.
2. Explain how environmental factors affect growth of microbes.
3. Understand the diversity of bacterial metabolism and how it is relevant in infectious diseases.
4. Discuss bacterial genetics with emphasis on mutations and bacterial gene transfer: the two mechanisms responsible for spread of antibiotic resistance as well as emergence of new strains of pathogens.
5. Describe the basic morphology of viruses, how they reproduce and cause diseases.
6. Explain various ways to control the growth of microbes.
7. Describe the system of Natural or innate immunity and how it provides protection.

8. Describe Adaptive immunity; understand how it is acquired, how it protects us, and how vaccines work.
9. Elucidate microbial mechanisms to overcome the host body's immune mechanisms and establish successful infections.
10. Understand how microbes are transmitted. Explain infection and disease control using preventative techniques to limit the spread of microbes.
11. Describe some of the normal microbiota of the nose, mouth, skin, and digestive system.
12. Describe microbial diseases of various human systems with emphasis on etiological agent, pathogenesis, symptoms, transmission, and treatment

**Microbiology 4000.02
Lecture Schedule, Autumn 2023**

Note: The following schedule is subject to change.

Week	Topic	Chapter	Assignments
Week 1 Aug 23-26	Introduction to Microbiology Types of Microbes and characteristics		Homework 1
Week 2 Aug 29-Sept 2	Bacterial morphology, cell structure		Quiz 1 Homework 2
Week 3 Sept 5-9	Microbial Metabolism (Sept. 4: Labor Day)		Homework 3
Week 4 Sept 12-16	Microbial Growth		Quiz 2 Homework 4
Exam 1			
Week 5 Sept 19-23	Microbial Genetics		Homework 5
Week 6 Sept 26-30	Viruses, Viroids, and Prions		Quiz 3 Homework 6
Week 7 Oct 3-7	Control of Microbial Growth		Quiz 7 Homework 7
Exam 2			
Week 8 Oct 10-14	Antimicrobial Drugs		Quiz 4 Homework 8
Oct 12-13	Fall Break		
Week 9 Oct 17-21	Innate Immunity		

Week 10 Oct 24-28	Adaptive Immunity	Homework 9
		Quiz 5 Homework 10

Week 11 Oct 31-Nov 4	Epidemiology	Quiz 11 Homework 11
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Exam 3

Week 12 Nov 7-11	Host-Microbe interactions (Nov 10: Veteran's Day)	15	Quiz 6 Homework 12
Week 13 Nov 14-18	Infectious diseases	24	Homework 13
Week 14 Nov 21-25	Infectious diseases (Thanksgiving Break: Nov 24,25)	25	Quiz 7 Homework 14

Week 15 Nov 28-Dec 2	Infectious diseases	Homework 15
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Exam 4

Assignment category (400 points)	Total Points
* <u>Homework</u> (choose any 10 out of 15 offered for <u>completion</u>)	50
<u>Quizzes with Adaptive Follow-up:</u> (choose any 5 out of 7 offered)	100
* <u>In-class Participation</u>	10
<u>Group Project</u>	20
<u>Exams</u> (4 Exams)	220
Total Course Points	400

Graded for completion *

All other assignments are graded for accuracy

Grading Scale (Total Course Points 400)

(Subject to change)

<u>Final total Percent</u>	<u>Final total points</u>	<u>Grade</u>		<u>Final total Percent</u>	<u>Final total points</u>	<u>Grade</u>
93-100%	372-400	A		77-79.9%	308-319	C+
90-92.9%	360-371	A-		73-76.9%	292-307	C
87-89.9%	348-359	B+		70-72.9%	280-291	C-
83-86.9%	332-347	B		67-69.9%	268-279	D+
80-82.9%	320-331	B-		60-66.9%	600-669	D

The table below gives additional information concerning the point categories above. Please read the information carefully and **ask if you have questions**.

ASSIGNMENTS

Homework:

- We will use Adaptive Learning Resource called LearnSmart (from McGraw Hill) in this course to encourage student preparedness. This smart technology uses continuously adapting learning path individualized for each student.
- The purpose of Homework is to help students check and improve their basic knowledge of the material. It is a tool for student practice and remediation and can be viewed as a warm-up exercise before you can delve into more complex and challenging topics of the chapter.
- All Homework assignments are always available until the end of the semester and can be completed anytime as your schedule allows.
- You will be assigned 15 chapters throughout the semester and each chapter is divided into 2-3 modules. The extent of questions asked for each chapter is not fixed (approximately 30-60 questions per chapter) since it will vary depending on the depth and complexity of the topics being covered.
- The credit for each Homework assignment is earned for the **completion** of the assignment and not the accuracy of the answers.
- You may choose **any 10 chapters for completion**, to get the full credit. If you choose to complete all 15 assignments, top grades for 10 assignments will count towards your final course grade.
- Each assignment can be **accessed multiple times** during the open period and **is not timed**. The assignment can also be accessed after the completion/submission if you wish to practice before the exam.

Quizzes

- There will be total 7 quizzes offered throughout the semester, that can be accessed through Connect platform from McGraw Hill. In order to receive the credit, all quizzes need to be submitted by the due date and time. There will be no credit for late submissions.
- Students may choose to complete **any 5 quizzes out of total 7** offered. Should you choose to complete all 15 quizzes, **lowest 2 quiz scores will be dropped**. There are **no make up quizzes**. If you miss a quiz, it will count as a dropped quiz score.
- Each quiz remains **available for a week**; however, **students can access the quiz only once during this open period**.
- These are **timed quizzes** and can be **accessed only once**. Unlike Homework, these quizzes can not be accessed multiple times or can not be previewed. Once you access the quiz, your timer starts; you must complete it and submit it within the allocated time.
- The questions from quizzes are designed to promote thinking and help students prepare for the exams. **Since the quizzes are timed, you are likely to perform better if you are familiar with the material and have actually studied the topics beforehand. Students are expected to be prepared and have some level of mastery over the content** before taking these quizzes, which will eventually help with students' performance in the Exams. Ample amount of time is allocated for each quiz completion. **It is strongly recommended for students to be familiar with the content before approaching these quizzes.**

Exams

- During the semester, there will be **four closed-book, non-cumulative (non-comprehensive) in-class exams administered through carmen**.
- Exam format will include a combination of multiple choice, true/false, short answer using 2-3 sentences, matching/labelling etc.
- **All exams are in-person**
- Please note the exam dates listed in the lecture schedule. Should you miss an exam and have a **valid** excuse (illness, death, accident, unavoidable conflict for academic reasons) you must contact the Instructor and provide a valid, written documentation for your absence in order to be eligible to take a make-up exam. The validity of the excuse document will be decided on case-by-case basis.
- Also note that the format of the make-up exam may be different than the regular exams (mix of short answer, multiple choice etc.). All make up exams must be completed within three days of the regularly scheduled exams.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and kind.

- **Writing style:** While there is no need to participate in class assignments as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably.
- **Citing your sources:** When we have academic projects, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion/project.

Copyright Disclaimer

The materials used in connection with this course are subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Academic Misconduct:

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

- **Quizzes and exams:** All quizzes and Exams are closed-book assessments. You must complete online exams and online quizzes yourself, without any external help or communication.
- **Written assignments:** Your written assignments should be your own original work. In formal assignments, you should cite the ideas and words of your research sources.
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with the instructor.
- **Falsifying research or results:** All work you will conduct in this course is intended to be a learning experience; you should never feel tempted to make up your work.
- **Collaboration and informal peer-review:** The course includes many opportunities for collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, **remember that comparing answers on a quiz or assignment is not permitted.** If you're unsure about a particular situation, please feel free just to ask ahead of time.

Ohio State's academic integrity policy. Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The

Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that "failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct. The Committee on Academic Misconduct web pages ([COAM Home](#))

Academic Support Services and Student Resources

The University offers a range of academic support services and resources to help students successfully handle the academic demands. A few examples of these services include Advising, Tutoring, Workshops to help students improve study skills. For further details, follow the links below or contact the office to take advantage of all these resources.

<http://advising.osu.edu/welcome.shtml>

<http://ssc.osu.edu>

<http://Younkinsuccess.osu.edu/academic-services>

The college of Arts and Sciences has a comprehensive list of Student Resources on its own website.

<https://artsandsciences.osu.edu/academics/current-students/resources>

Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu>

Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Diversity, Equity and Inclusion

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach their own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited. There is no tolerance for hateful speech or actions. All violations of this policy should be reported to the OSU Bias Assessment and Response Team (BART, <http://studentaffairs.osu.edu/bias/>).

Accessibility accommodations for students with disabilities

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's [request process](#), managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you [register with Student Life Disability Services](#). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Student Wellness and Counseling Services

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other and alcohol use among the top ten health impediments to academic performance. As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, social isolation, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. Students experiencing personal problems or situational crises during the semester are encouraged to contact OSU Counseling and Consultation Services (614-292-5766) for assistance, support and advocacy. This service is free and confidential.

- OSU offers a range of services to assist students experiencing elevated stress levels. **Counseling and Consultation Service** (CCS; ccs.osu.edu) provides a range of confidential mental health services to students.
- 24-hour emergency help is also available through the **National Suicide 24/7 Prevention Hotline** at 1-800-273-TALK or at suicidepreventionlifeline.org.
- **Wellness Coaching** (go.osu.edu/wellnesscoaching) is a free service provided by the Office of Student Life that takes an empowering, strength-based approach to building your capacity to face challenges and navigate transitions in order to create the life you want to live.
- In addition, the "**Student Advocacy Center** is committed to helping students navigate Ohio State's structure and to resolving issues that they encounter at the university" (<http://advocacy.osu.edu>).