

Medical Microbiology (Biology 352) – Spring 2022

4 credits

Course Syllabus



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**Instructor**: Dia C. Beachboard, Ph.D.

Office Location: Hurd Science Center Room 129

Office Hours: M: 2:00pm-3:00pm

W 8:30am-9:30am

F: 2:00pm-3:00pm

Office Phone: (610) 282-1100, ext. 2111

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**Meeting Times and Locations**:

**Lecture**: MWF 10am-10:50am: Hurd Science Center Auditorium

**Lab**: TTh Hurd Science Center Room 115

Section 1: TTh 8am - 9:25am

Section 2: TTh 9:30am -10:55am

Section 3: TTh 12:30pm -1:55pm

**Prerequisites**: BI-151, BI-255 and CH-231. Not open to students who have taken BI-252. Must register for BI-352L.

**Course Description**: An advanced study of medically relevant microorganisms, including bacteria, viruses, protozoa and fungi. The structure, reproduction, metabolism, and taxonomy of these organisms will be studied. Major emphasis will be placed on the clinical aspects in terms of transmission, disease pathology, clinical identification and treatment. Lecture 3 hours, lab 3 hours. Course fee.

**Textbook and required Materials**:

1. OpenStax Microbiology. <https://openstax.org/details/books/microbiology?Book%20details>
2. Pressbook. DeSales Microbiology eBook. Optional – New resource in development)

<https://oer.pressbooks.pub/desalesmicro/>

1. Registration in Blackboard Course site
2. The Lab manual will be electronic and available in the Blackboard Course site
3. Other resources may be used and will be provided via the Blackboard Course site

**Hardware and Software requirements**: As the course will contain online content, students will be expected to have a laptop computer, smart phone, or tablet. Most quizzes will be administered on Blackboard.

**Blackboard**: You will need to access Blackboard for quizzes and assignments. Additionally, lab (lab handouts) and course materials (powerpoint slides and videos) and helpful links will also be available on the Blackboard course site. We will be using the Lecture course site for both lecture and lab.

If you have trouble with Blackboard, see the [Technology Help Desk](https://www.desales.edu/academics/academic-support-resources/technology-help-desk) website or call them at 610-282-1100 x4357.

**Student Learning Outcomes to be achieved in this Course**: At the successful completion of this course, the students will demonstrate the following student outcomes:

1. Describe and distinguish among the groups of organisms and infectious agents known as microorganisms.
2. Describe beneficial activities of microorganisms in the world.
3. Identify, describe, and explain the major features of the biology of microorganisms including: structure, growth, environmental effects on growth, classification, metabolism, and genetics.
4. Describe and compare the benefits and limitations of physical, chemical, and chemotherapeutic means of controlling microbial growth.
5. Compare the benefits and limitations of the different methods for identification and classification of bacteria.
6. Explain the cause and ramifications of the growing problem of antibiotic resistance.
7. Identify from a brief description of the disease or the characteristics of the disease agent and differentiate among 72 important agents of disease.
8. Identify and explain the major features of the movement of disease in populations.
9. Describe and explain the activities and benefits of the Centers for Disease Control.
10. Explain how features of infectious microorganisms enable them to cause infection.
11. Explain how the body fights infection.
12. Describe the significance and causes of healthcare associated infections and explain how we can reduce them.
13. Describe the normal flora and characteristics of each organ system as they relate to disease of that system.

**Course Methodology:** Methods of instruction will include: (1) Lecture, (2) Discussion, and (3) Research Presentations. Lab will be practical experiments designed to teach basic microbiology techniques and use those techniques to identify an unknown bacterial culture.

**Attendance:** Students are expected to attend all classes in-person.

The attendance policy is stated in the *Undergraduate Catalog*. Excessive absences (more than five, which includes missing online assignment deadlines) can adversely affect your final grade, or you may be removed from the course. If you arrive late or leave early, you might not get credit. If you attend via live *Zoom* but without a camera (that clearly shows your presence), you may not get credit. If you miss lab, you will be required to do a make-up assignment.

**Academic Integrity**: Students should refer to the DeSales University Undergraduate Catalog regarding the Academic Honesty Policy. In brief, cheating of any kind will NOT be tolerated and all work submitted by students is expected to be original. Violations will be managed on a case-by- case basis as described in the Undergraduate Catalog. In addition to the rules and regulations delineated in the Undergraduate Catalog: students are not permitted to discuss exams or quizzes during the time of the exam. The time of the exam for this course is defined as the moment the first student takes the exam/quiz until the moment the last student takes the exam/quiz.

**Course Eval**: Students are expected to provide constructive criticism and feedback regarding the course content and instructor performance through an anonymous online survey (CoursEval) that will be made available near the end of the semester. This survey is important to improve the content and delivery of this course. Since the survey is a requirement for class participation, you will receive 10 points towards your grade in the class if you provide the acknowledgement form which indicates you have completed the survey to me via email.

**Evaluation of Student Learning:** There will be a total of 1000 points for the course. The breakdown of those points is:

|  | **Individual Points** | **Total Points** |
| --- | --- | --- |
| Quizzes (12) | 10 | 110pt (lowest dropped) |
| Exams (3) | 100 | 300pt |
| Cumulative Final exam (1) | 150 | 150pt |
| Research Presentation (1) | 80 | 80pt |
| Discussion Board Articles (5) | 10 | 50pt |
| Course Eval | 10 | 10 |
| Lab Quizzes (11) | 10 | 100pt (lowest dropped) |
| Lab Books (2) | 25 | 50pt |
| Lab Exam (2) | 75 | 150pt |
| Total | --- | 1000 |

**Grading Scale:** Course Grade = (Total points/1000) x 100%

A = 93.00 – 100.00%

A- = 90.00 – 92.99%

B+ = 87.00 – 89.99%

B = 83.00 – 86.99%

B- = 80.00 – 82.99%

C+ = 77.00 – 79.99%

C = 73.00 – 76.99%

C- = 70.00 – 72.99%

D+ = 67.00 – 69.99%

D = 60.00 – 66.99%

F =<60%

The letter grades in this course are not ‘curved’ or ‘rounded’.The grade you earn is the grade you receive.

**Exams/Quiz/Assignment Make-Up Policy**: Unexcused missed exams count as a zero. Arrangements will be made for excused missed exams. Please contact me before class (if possible) or within 24h of the missed class. A note is required for all excused missed exams. The instructor reserves the right to change the format to ensure fairness.

**Disabilities:** Students with a documented disability who wish to request academic adjustments should contact the Director of the Office of Student Accessibility (Dooling Hall, room 26, extension 1453).

**Quiz/Exam Return Policies:** Quizzes will be electronic, and feedback will be displayed after the due date. Exams will not be returned. Grades will be posted to Blackboard as soon as possible after completion. There will be viewing times during lab after all exams are graded.

**Academic Success Center:** The Academic Success Center (Dooling Hall Room 23) is an excellent resource for additional help with this course. A tutor is available for this course. See the Academic Resource Center for more information.

**Class Recording Policy**: By registering for or attending DeSales University courses, individuals consent to the recording of classes within the scope of the DeSales University Class Recording Policy, available at [www.desales.edu/policies](http://www.desales.edu/policies). All lectures will be recorded via zoom and uploaded to Blackboard so students can review them while studying.

**Note Regarding Lab:** Due to the nature of working with LIVING organisms and cells, work outside of the designated lab time may be required. Students are responsible for maintaining their own cells during and outside of lab. There will also be a few instances where you will need to work on a few experiments outside of the designated lab time in order to complete the experiments in a timely manner. Groups are encouraged to share this duty throughout the semester.

**SDS Online:** DeSales University utilizes an online SDS management system. You can access SDS sheets for every chemical used in all labs at DeSales via the link below. You are expected to review the SDS sheets for every lab in which we use chemicals to familiarize yourself with the safety requirements for that particular lab.

<https://msdsmanagement.msdsonline.com/company/FCB4C140-2E95-46B6-A46D-5BEDD13CBF63>

**Student Wellness:**

The Counseling Center is available for student wellness concerns such as anxiety, depression, stress management, grief, etc. To request an appointment with a counselor, please contact the Counseling Center at www.desales.edu/counselingrequest.

**Campus Closures/Delays:**

In the event of a campus closure (i.e. a snow day) or delayed opening, your instructor will communicate plans for the day via Blackboard and Discord the morning of the closure/delay.

**Tentative Lecture Schedule:** Please note that this schedule is subject to change. See Blackboard Coursesite for any adjustments.

| **Date** | **Day** | **Topic** | **Reading** |
| --- | --- | --- | --- |
| Week 1 |  |  |  |
| Jan 19 | Wed | Introduction and Syllabus | Syllabus |
| Jan 21 | Fri | Classification/History  Quiz 1 | Ch 3 |
| Week 2 |  |  |  |
| Jan 24 | Mon | Classification/History | Ch 3 |
| Jan 26 | Wed | Eukaryotic and Prokaryotic cell structure  *Add/Drop Deadline* | Ch 3 |
| Jan 28 | Fri | Eukaryotic and Prokaryotic cell structure  Quiz 2 | Ch 3 |
| Week 3 |  |  |  |
| Jan 31 | Mon | Microbial Growth | Ch 9 |
| Feb 2 | Wed | Microbial Growth | Ch 9 |
| Feb 4 | Fri | Microbial Metabolism  Quiz 3 | Ch 8 |
| Week 4 |  |  |  |
| Feb 7 | Mon | Microbial Metabolism | Ch 8 |
| Feb 9 | Wed | Review  Discussion Board 1 Due |  |
| Feb 11 | Fri | **Exam 1** |  |
| Week 5 |  |  |  |
| Feb 14 | Mon | Microbial Genetics | Ch 11 |
| Feb 16 | Wed | Microbial Genetics | Ch 11 |
| Feb 18 | Fri | Microbial Genetics  Quiz 4 | Ch 11 |
| Week 6 |  |  |  |
| Feb 21 | Mon | Diversity: Prokaryotes Microbes | NA |
| Feb 23 | Wed | Diversity: Eukaryotes Microbes | NA |
| Feb 25 | Fri | Diversity: Acellular Microbes  Quiz 5  *Credit/Audit and Pass Fail Deadline* | NA |
| Week 7 |  |  |  |
| Feb 28 | Mon | Microbial Control: Disinfectants | Ch 13 |
| Mar 2 | Wed | Microbial Control: Disinfectants | Ch 13 |
| Mar 4 | Fri | Microbial Control: Antimicrobials  Quiz 6 | Ch 14 |
| Week 8 |  |  |  |
| Mar 7 | Mon | *Spring Break* | *No Class* |
| Mar 9 | Wed | *Spring Break* | *No Class* |
| Mar 11 | Fri | *Spring Break* | *No Class* |
| Week 9 |  |  |  |
| Mar 14 | Mon | Microbial Control: Antimicrobials | Ch 14 |
| Mar 16 | Wed | Review  Discussion Board 2 Due |  |
| Mar 18 | Fri | **Exam 2** |  |
| Week 10 |  |  |  |
| Mar 21 | Mon | Epidemiology | Ch 16 |
| Mar 23 | Wed | Pathogenicity | Ch 15 |
| Mar 25 | Fri | Pathogenicity  Quiz 7 | Ch 15 |
| Week 11 |  |  |  |
| Mar 28 | Mon | Innate Immunity | Ch 17 |
| Mar 30 | Wed | Innate Immunity | Ch 17 |
| Apr 1 | Fri | Adaptive Immunity  Quiz 8 | Ch 18 |
| Week 12 |  |  |  |
| Apr 4 | Mon | Adaptive Immunity | Ch 18 |
| Apr 6 | Wed | Lab analysis | Ch 20 |
| Apr 8 | Fri | Lab analysis  Quiz 9  *Last Day to Withdrawal with W, WP, WF* | Ch 21 |
| Week 13 |  |  |  |
| Apr 11 | Mon | Review  Discussion Board 3 Due |  |
| Apr 13 | Wed | **Exam 3** |  |
| Apr 14 | Thurs | *Classes Follow Monday Schedule*  Respiratory Infections | Ch 22 |
| Apr 15 | Fri | *Easter Break* | *No Class* |
| Week 14 |  |  |  |
| Apr 18 | Mon | *Easter Break* | *No Class* |
| Apr 20 | Wed | Respiratory Infections/ Gastrointestinal Infections  **Microbial Diversity Presentations Due** | Ch 22/Ch 24 |
| Apr 22 | Fri | Gastrointestinal Infections  Quiz 10 | Ch 24 |
| Week 15 |  |  |  |
| Apr 25 | Mon | Urogenital Infections | Ch 23 |
| Apr 27 | Wed | Skin and Eyes Infections | Ch 21 |
| Apr 29 | Fri | Skin and Eyes Infections/ Cardiovascular and Lymphatic Systems Infections  Quiz 11 | Ch 21/25 |
| Week 16 |  |  |  |
| May 2 | Mon | Cardiovascular and Lymphatic Systems Infections | Ch 25 |
| May 4 | Wed | Nervous System Infections | Ch 26 |
| May 6 | Fri | Review  Quiz 12  Discussion Board 4 & 5 Due |  |
| Week 17 |  |  |  |
| May 9-14 | TBD | **Cumulative Final Exam** |  |

**Tentative Lab Schedule:** Please note that this schedule is subject to change. See Blackboard Course site for any adjustments.

| **Week** | **Lab** | **Topic** |
| --- | --- | --- |
| Jan 20 | 1 | Please Note No Lab on Tuesday Jan 18th  Safety |
| Jan 25/27 | 2 | Aseptic Technique and Culturing the Environment |
| Feb 1/3 | 3 | Microscopy/Simple stain |
| Feb 8/10 | 4 | Differential Stains- Gram stain, acid fast stain, Endospore stain  Culturing body |
| Feb 15/17 | 5 | Culturing microbe on different media |
| Feb 22/24 |  | **Lab practical 1 – Lab Notebook Due** |
| Mar 1/3 | 6 | Enumeration |
| Mar 8/10 |  | Spring Break |
| Mar 15/17 | 7 | Phage Lab |
| Mar 22.24 | 8 | Antibiotics and Disinfectants |
| Mar 29/31 | 9 | Culturing Gram positive and Negative bacteria |
| Apr 5/7 | 10 | Person-to-Person Transmission |
| Apr 12 | 11 | CDC epidemiology – Online with no lab quiz |
| Apr 19/21 | 12 | Unknowns |
| Apr 26/28 |  | **Lab Practical 2 - Lab Notebook Due** |
| May 3/5 |  | No Lab |

Lab Quizzes are due by end of the day Monday before the lab. For lab practicals, each lab will be split into 2 groups. Group A will take them on Tuesday Feb 22 and Thursday Apr 28 and Group B will take them on Thursday Feb 24 and Tuesday Apr 26.



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Submitted by DeSales University. Adapt as needed: *This syllabus was created by Dia Beachboard in the summer of 2022. Support for the project was generously provided by the* [*Pennsylvania Grants for Open and Affordable Learning (PA GOAL) program*](https://sites.google.com/palci.org/pagoal/home?authuser=0)*, Grant #45. This work is licensed under a* [*Creative Commons Attribution-NonCommercial 4.0*](https://creativecommons.org/licenses/by-nc/4.0/)