Course Syllabus

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MARIAN UNIVERSITY
Indianapolis

Bio 214 Microbiology 4 Credits

Semester and Year: First Five-Weeks, Summer 2023

Email: Contact via Canvas email

Required Textbook(s):

Access Card: Includes the Virtual Lab and E-book

Talaro, K. P., & Chess, B. Connect and LearnSmart Labs Access Card for Foundations in Microbiology. New York: McGraw-Hall, 2017. Talaro, Kathleen Park. (Includes e-book - Foundations in Microbiology, 11e New York: McGraw-Hall, 2017.)

ISBN 9781260451320

Students are required to purchase the items listed above prior to the start of the course. Look into all of your options - new, used, rental or e-books. If you choose a rental option, be sure to understand the policies and the due dates for the returns. While you have the option to obtain your course materials from any source, ordering from the MU Book Store can be a convenient option. Please note that you can also charge bookstore purchases to your student account or use your MU financial aid if applicable. Visit **the Marian bookstore (Links to an external site.) (http://www.bkstr.com/marianustore/home)** .

Textbook Resources Website:

Accessing McGraw-Hill Connect Labs

1. Click McGraw-Hill Connect (left navigation) of our course
2. Click Begin
3. Click Register
4. Insert your email address
5. Insert your registration code or purchase the access directly here for $122.50 USD

Additional Resources:

The Mother Teresa Hacklemeier Memorial Library at Marian University provides various databases **http://www.marian.edu/library/Pages/default.aspx (Links to an external site.)** **(http://www.marian.edu/library/Pages/default.aspx)**

Course Description:

A study of bacteria, viruses, and other microorganisms; their morphology, development, and function; techniques of isolation, cultivation, and identification; with emphasis on structure, metabolism, role in disease, and immune responses to infection. Three lecture hours per week and three lab hours per week. This course satisfies general education curriculum standards for the development of scientific knowledge.

Student Learning Objectives:

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

1. Be able to list diverse forms of microbial life on the planet earth and key fundamental discoveries in microbiology that shaped our lives. Differentiate prokaryotic and eukaryotic organisms including non-cellular virus particles based on their unique characteristics and living conditions in nature.
2. Outline the currently used procedures applied to safely-handle microbiological samples in a hospital or clinical environment or during transport to an analytical laboratory.
3. Explain the appropriate physical, chemicals (e.g. alcohol, antimicrobials) and radiation procedures for the removal or suppression of growth of microbes in various materials including human tissue.
4. Describe standard procedures for microbial control that include but not limited to disinfection of living tissue by applying aseptic technique, or procedures for sterilizing surgical tools, and more broadly, pasteurization or quality control of products in health facilities and food or biotechnology industry.
5. Discuss various stages in the progression of disease caused by bacteria. Discuss bacteria-specific virulence factors required for entry, colonization or biofilm formation, and spread of infection by shedding as part of human waste.
6. Explain human-microbe interaction with an overview of the human immune system and how it defends against bacteria and viruses by various levels of innate and acquired immunity (vaccination).
7. Identify the importance of human resident microflora and its recently discovered links to human health. Discuss few examples of prevailing conditions which may allow opportunistic human pathogens to cause disease.
8. Outline some examples of human pathogens of global importance and their mode of infection. Methods useful for their isolation and identification, monitoring or source tracking of infectious diseases or epidemiology, and impact on public health and global economy will be discussed.

Course Learning Objectives	**Methods of Assessment**

Be able to list diverse forms of microbial life on the planet earth and key fundamental discoveries in microbiology that shaped our lives. Differentiate prokaryotic and eukaryotic organisms including non-cellular virus particles based on their unique characteristics and living conditions in nature.	Quiz 1, Exam 1, Human- Microbe Interactions Assignment, Gram Staining Discussion, Cell Anatomy Lab, How Enzymes Function Lab, Staining Lab, Fungal Disease Discussion
Outline the currently used procedures applied to safely-handle microbiological samples in a hospital or clinical environment or during transport to an analytical laboratory.	Quiz 1, Exam 1, Lab Safety Lab, Metric Measurements Lab, Scientific Method Lab, Microscopy Microbiology Lab
Explain the appropriate physical, chemicals (e.g. alcohol, antimicrobials) and radiation procedures for the removal or suppression of growth of microbes in various materials including human tissue.	Quiz 2, Exam 2, MRSA Case Study, Microbial Growth Lab, Control of Microbial Growth Lab
Describe standard procedures for microbial control that include but not limited to disinfection of living tissue by applying aseptic technique, or procedures for sterilizing surgical tools, and more broadly, pasteurization or quality control of products in health facilities and food or biotechnology industry.	Quiz 2, Exam 2. Nosocomial Case Study, Aseptic Technique Lab, Control of Microbial Growth Lab
Discuss various stages in the progression of disease caused by bacteria. Discuss bacteria-specific virulence factors required for entry, colonization or biofilm formation, and spread of infection by shedding as part of human waste.	Quiz 3, Exam 3, Abstract 1
Explain human-microbe interaction with an overview of the human immune system and how it defends against bacteria and viruses by various levels of innate and acquired immunity (vaccination).	Quiz 3, Exam 3, Vaccine History Case Study, Abstract 2, Blood Lab
Identify the importance of human resident microflora and its recently discovered links to human health. Discuss few examples of prevailing conditions which may allow opportunistic human pathogens to cause disease.	Quiz 4, Exam 4, Human-Microbe Interactions Assignment, Abstract 3, Medical Microbiology
Outline some examples of human pathogens of global importance and their mode of infection. Methods useful for their isolation and	Quiz 4, Exam 4, Viral Presentation, Influenza Debate Discussion,

identification, monitoring or source tracking of infectious diseases or epidemiology, and impact on public health and global economy will be discussed.	Isolation Methods Lab, Identification of Unknown Bacteria Lab, Gram Stain Discussion

Teaching Strategies:

Audios, discussion, assigned readings, web-based activities, and assignments

Assignments & Assessment Methods:

Performance assessment:	**Total Points**
4 lecture exams	400 points
4 lecture quizzes	100 points
7 homework assignments	175 points
4 discussion board	100 points
Viral Presentation	50 points
Lab Reports	135 points
Total	960 points

Methods of Evaluation:

The student is expected to demonstrate competence through class participation, written exams, homework assignments, laboratory exercises, and written and oral presentations.

Grading Scale:

The grading scale for this course is:

Letter Grade	**Percentage**
A	94-100%
A-	90-93.9%

B+	87-89.9%
B	83-86.9%
B-	80-82.9%
C+	77-79.9%
C	73-76.9%
C-	70-72.9%
D+	65-69.9%
D	60-64.9%
F	<60%

Course Policies:

Academic Integrity:

The search for truth, the transmission of knowledge, and the facilitation of moral development are the avowed goals of institutions of higher education around the world. Members of the Marian University community are expected to maintain the highest level of honesty in every phase of their academic lives and to help create and promote an ethical atmosphere in which the goals of the University can be fully realized. All Marian University students are responsible for knowing and avoiding academically dishonest behaviors.

Plagiarism (using the ideas and/or words of someone else without proper reference) and other forms of cheating are not tolerated. *Students guilty of plagiarism or other forms of cheating are subject to disciplinary action that may include failure in the course or expulsion from the University.* For more details on plagiarism, see reference materials posted in the Introduction module. Thus, be sure to properly cite and reference all sources used.

Plagiarism is defined in detail in the **Code of Student Rights and Responsibilities** (https://www.marian.edu/docs/default-source/campus-life/codeofstudentrightsandresponsibilities.docx?sfvrsn=14) under Section 8: Academic Conduct Procedures, as well as an extended description of academic dishonesty.

Late Policy & Due Date Extensions: Acceptance of work submitted past the due date or requests of due date extensions, including exams, may be considered in the event of unforeseen, documented hardships, such as medical emergencies, documentable technical issues, death of a loved one, etc. However, simply forgetting, time zone differences, going on vacation, or not preforming a well as intended are not acceptable excuses.

Exam Retakes: Exams retakes are different than requesting and being granted an extension on an exam. There are no exam retakes allowed in this course. Once you open an exam, you're stating that you have prepared adequately for the exam and you're accepting the results of the exam.

Extra Credit: There is no extra credit in this course.

Withdrawal:
It is the responsibility of the student to know and follow the University policies on academic integrity and class withdrawal.

Students with Disabilities:

Students with disabilities who have proper documentation must contact the Director of Academic Support Services in the Counseling and Consultation Services office to set up a documentation review. If after the review, accommodations are deemed appropriate, an accommodation plan will be developed. As per the ADA (Americans with Disabilities Act) no accommodations can be provided until this process is complete.

Accommodation/Accessibility Statement**:** Marian University, through policy and practice, is committed to providing equitable access to learning opportunities for all students. If you experience, or anticipate experiencing, barriers to your education due to a disability please contact the Personalized Learning Center by emailing **plc@marian.edu (mailto:plc@marian.edu)** or calling **317.955.6540** to start a conversation.

Although a student may request an accommodation at any time, it is best to initiate the accommodation process as early as possible as it may take time to complete the interactive process and accommodations will not be implemented retroactively. If a reasonable accommodation is determined, a Course Accommodation Letter will be created at the Personalized Learning Center for the student to provide to their faculty members with information related to their accommodations. Faculty will not set up disability-related accommodations without a current semester Course Accommodation Letter.

Faculty, Staff or Student questions or concerns regarding the accommodation process can be sent to **plc@marian.edu (mailto:plc@marian.edu)** or Mandie Greiwe, **agreiwe@marian.edu (mailto:agreiwe@marian.edu)**, Director of the Personalized Learning Center.

Diversity & Inclusion Statement: Marian's Adult and Online Programs (MAP) at Marian University is a collaborative academic community committed to fostering a diverse and inclusive community across the intersections of race, ethnicity, religion, sexual orientation, gender identity, age, disability status, socio-economic background, political perspective, culture, immigration status, and national origin. Online

programs is committed to creating a safe and just environment of respect for students, faculty, and staff following our shared Franciscan values.

****Any changes to this syllabus will be communicated to the students.**

Course Summary:

Date	Details	Due
Fri May 12, 2023	Take: Quiz 1 (https://marian.instructure.com/courses/3717399/assignments/40847937)	due by 11:59pm
Sat May 13, 2023	1st Lab - Virtual Labs Tutorial (https://marian.instructure.com/courses/3717399/assignments/41080539)	due by 11:59pm
	Lab Safety - Personal Safety (https://marian.instructure.com/courses/3717399/assignments/41080544)	due by 11:59pm
	Metric Measurement - Temperature (https://marian.instructure.com/courses/3717399/assignments/41080534)	due by 11:59pm
	Metric Measurement - Volume (https://marian.instructure.com/courses/3717399/assignments/41080538)	due by 11:59pm
	Discuss: Welcome and Introductions! (Initial posts due on Wednesdays) (https://marian.instructure.com/courses/3717399/assignments/40847953)	due by 11:59pm
Sun May 14, 2023	Take: Exam 1 (https://marian.instructure.com/courses/3717399/assignments/40847929)	due by 11:59pm
	Submit: Article Summary 1 (https://marian.instructure.com/courses/3717399/assignments/40847967)	due by 11:59pm
	Submit: Human-Microbe Interactions (https://marian.instructure.com/courses/3717399/assignments/40847971)	due by 11:59pm
	Submit: MRSA Case Study (https://marian.instructure.com/courses/3717399/assignments/40847972)	due by 11:59pm

Date	Details	Due
Fri May 19, 2023	Take: Quiz 2 (https://marian.instructure.com/courses/3717399/assignments/40847921)	due by 11:59pm
Sat May 20, 2023	Bacterial Genetics - DNA Profiling (https://marian.instructure.com/courses/3717399/assignments/41080536)	due by 11:59pm
	How Enzymes Work - Effect of Temperature (https://marian.instructure.com/courses/3717399/assignments/41080533)	due by 11:59pm
	How Enzymes Work - Enzyme Activity (https://marian.instructure.com/courses/3717399/assignments/41080547)	due by 11:59pm
	Microscopy - Operation of Brightfield Microscope (https://marian.instructure.com/courses/3717399/assignments/41080545)	due by 11:59pm
	Discuss: Research Fungal Diseases Discussion (Initial posts due on Wednesdays) (https://marian.instructure.com/courses/3717399/assignments/40847957)	due by 11:59pm
Sun May 21, 2023	Submit: Article Summary 2 (https://marian.instructure.com/courses/3717399/assignments/40847968)	due by 11:59pm
	Submit: Nosocomial Case Study (https://marian.instructure.com/courses/3717399/assignments/40847973)	due by 11:59pm
	Take: Exam 2 (https://marian.instructure.com/courses/3717399/assignments/40847948)	due by 11:59pm
Fri May 26, 2023	Take: Quiz 3 (https://marian.instructure.com/courses/3717399/assignments/40847915)	due by 11:59pm

Date	Details	Due
Sat May 27, 2023	Aseptic Technique - Broth Culture to Sterile Agar Plate (https://marian.instructure.com/courses/3717399/assignments/41080531)	due by 11:59pm
	Isolation Methods - Quantification by Colony Counting (https://marian.instructure.com/courses/3717399/assignments/41080546)	due by 11:59pm
	Staining - Gram Staining (https://marian.instructure.com/courses/3717399/assignments/41080540)	due by 11:59pm
	Staining - Preparing a smear sample from a bacterial sample (https://marian.instructure.com/courses/3717399/assignments/41080541)	due by 11:59pm
	Discuss: Gram Stain Discussion (Initial posts due on Wednesdays) (https://marian.instructure.com/courses/3717399/assignments/40847958)	due by 11:59pm
Sun May 28, 2023	Submit: Article Summary 3 (https://marian.instructure.com/courses/3717399/assignments/40847969)	due by 11:59pm
	Take: Exam 3 (https://marian.instructure.com/courses/3717399/assignments/40847926)	due by 11:59pm
Sat Jun 3, 2023	Blood - Differential White Blood Cell Count (https://marian.instructure.com/courses/3717399/assignments/41080535)	due by 11:59pm
	Control of Microbial Growth - Antimicrobic Sensitivity Testing (Kirby-Bauer Method) (https://marian.instructure.com/courses/3717399/assignments/41080532)	due by 11:59pm
	Microbial Growth- Effects of pH (https://marian.instructure.com/courses/3717399/assignments/41080543)	due by 11:59pm
	Discuss: Influenza Debate (Initial posts due on Wednesdays) (https://marian.instructure.com/courses/3717399/assignments/40847955)	due by 11:59pm

Date	Details	Due
Sun Jun 4, 2023	Submit: Design Your Own Viral Presentations (https://marian.instructure.com/courses/3717399/assignments/40847970)	due by 11:59pm
	Submit: Vaccine History Case Study (https://marian.instructure.com/courses/3717399/assignments/40847974)	due by 11:59pm
Fri Jun 9, 2023	Take: Quiz 4 (https://marian.instructure.com/courses/3717399/assignments/40847910)	due by 11:59pm
Sat Jun 10, 2023	Ubiquity of Microorganisms - Sampling Surfaces for Bacteria (https://marian.instructure.com/courses/3717399/assignments/41080537)	due by 11:59pm
	Unknown Bacterial Identification - Sample #1 (https://marian.instructure.com/courses/3717399/assignments/41080542)	due by 11:59pm
	Take: Exam 4 (Chapters 6, 11, 12 and cumulative review [Chapters 4, 7 and 13]) (https://marian.instructure.com/courses/3717399/assignments/40847931)	due by 11:59pm