

## Bacterial Pathogenesis

**Course number: MCB 426**

**Semester:** Spring 2021

**Meeting Time:** Monday, Wednesday and Friday: 10:00 – 10:50 P.M.

**Room:** Zoom

**Instructor:** Dr. Thomas E. Kehl-Fie

**Office:** CLSL B401

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**Email:** [kehlfie@illinois.edu](mailto:kehlfie@illinois.edu) Please include MCB 426 in the subject line of emails.

Office Hours: Wednesdays 2-3 P.M. or by appointment via Zoom. Office hour appointment requests should be made at least 48 hrs in advance.

Teaching Assistant: Paola Parraga

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Office Hours: Mondays 4-5 P.M. via Zoom. Office hour appointment requests should be made at least 48 hrs in advance.

**Website:** <https://learn.illinois.edu/> (sign in using your login and AD password). All course materials including, Zoom links, schedule, and assigned readings can be found on the course website.

**Course Reading:** A text book and primary literature will be used for the course

**Text Book:** Bacterial Pathogenesis a Molecular Approach by Drs. Brenda Wilson, Malcom E. Winkler, and Brian T. Ho, 4<sup>th</sup> Edition. ASM Press (WILEY). 2019. An eBook is available.

**Primary Literature:** The articles that will be discussed in class will be posted on the course website.

### Goals of the Course:

1. Build a foundation of knowledge that will enable you to discuss and critically evaluate topics related to microbial pathogenesis.
2. Develop your ability to critically evaluate new knowledge and apply it to existing problems in microbial pathogenesis.
3. Develop your ability to work with individuals with diverse backgrounds and expertise.
4. Improve your science communication skills.

### Foundational Concepts Covered:

1. The magnitude of the existing and escalating problems faced by microbiologists, infectious disease healthcare workers, scientists, and the world.
2. Criteria and methods by which we can determine causal linkages between pathogens, their products and disease.
3. Host defenses that protect the body and must be overcome to establish infection.
4. Mechanisms by which bacterial pathogens initiate infection.
5. Mechanisms by which bacterial pathogens subvert and evade host defenses and disseminate.
6. Identification and characterization of virulence factors that contribute to infections and transmission in human/animal populations.
7. Mechanisms or strategies by which we can prevent, cure or combat bacterial infections and their symptoms.

**Course Format:** The course will use class periods for active-learning with significant team-based problem-solving content. Small group problem sets and in class discussions including that of primary literature will occupy the bulk of in class activities. Lectures will be pre-recorded and available on the course website. The weekly schedule is as follows:

**Mondays:**

Experimental Approach and Design Discussion  
Q & A period for material covered the prior week  
Post-lecture assignment due (11:59 PM central time)

**Wednesdays:**

In-class small group problem set  
Small group problem sets due (11:59 PM central time)

**Fridays:**

Journal discussion pre-assignments due prior to the beginning of class.  
Weeks 1-4 Discussion of how to ready a journal article  
Weeks 5-15 In-class journal discussion (participation/attendance points awarded). No journal discussion on exam weeks. Weeks 5 (2/26), 9 (3/26) and 14 (4/30) Exam

**Evaluation and Grading:**

Post Lecture Assignments (10 Points each)	90 Pts (The top 9 out of 11 will be used)
Small Group Problem Set (10 Points each)	90 Pts (The top 9 out of 10 will be used)
Journal Discussion Pre-Assignment (5 Points each)	45 Pts (The top 9 out of 11 will be used)
Journal Discussion (25 Points each)	175 Pts (The top 7 out of 8 will be used)
Exams including the Final (200 Points each)	600 Pts (The top 3 out of four will be used)

**GRADING SCALE**

A	934-1000
A-	900-933
B+	867-899
B	834-866
B-	800-833
C+	767-799
C	734-766
C-	700-733
D+	667-699
D	634-666
D-	600-633
F+	567-599
F	<567

**Post Lecture Assignments:** These assignments are structured as short (20 min) online multiple choice quizzes, focusing on the assigned text book reading and video lectures from the previous week (i.e., the assignment due the 2nd week of class will focus on the material covered the 1st week).

The assignment will open on Moodle after class on Monday and must be completed by 11:59 PM central time on the same day.

The goal of these assignments is to provide an opportunity for self-assessment of progress towards mastering the foundational knowledge necessary to understand, discuss, and critically evaluate material related to bacterial pathogenesis.

**Small Group Problem Sets:** The problem sets will consist of several short answer questions intended to be worked on with a student's small group in class. While working together on the problem sets is encouraged (but not required), you must submit your own assignment, which answers the questions using your own words. During

the first in-class discussion you will be assigned to your small group. Zoom breakout rooms will be used to facilitate small group discussions on Wednesdays.

The questions will be posted on Moodle at the beginning of class on Wednesday and must be submitted, using Moodle, by 11:59 PM Central time on the same day.

The primary goal of these assignments is to facilitate developing the ability to apply foundational knowledge (of microbial pathogenesis) to new situations, to critically evaluate new knowledge and integrate it into an existing frame work, and design experiments to investigate problems relevant to microbial pathogenesis. Additional goals include developing science communication skills and the ability to work collaboratively with people who have diverse experiences and knowledge bases.

**Journal Pre-Assignment:** Pre-assignments are due on weeks 2-15 except as noted on the course website. These assignments should be completed after reading the assigned journal article using the template on the course website. Weeks 2-4 will use unique pre-assignments, which are available on the course website, with special instructions.

They are due Friday (except as noted) before class and must be submitted via Moodle.

The goals of these assignments is to prepare students for the in-class discussion of journal articles and facilitate the development of the skills necessary to critically read and evaluate primary literature.

**Journal Discussions:** To receive credit, you must be present in class and able to discuss the paper. Journal discussions will take place on Fridays on weeks 6-15 except as noted on the course website. The specific expectations for the discussion will be discussed the first Friday of the class.

The goals of these assignments is to facilitate the development of the skills necessary to critically read and evaluate primary literature, as well as communicate these evaluations. They will also provide exposure to current topics in microbial pathogenesis.

**Exams:** There will be four equally weighted exams throughout the course. Due to the nature of the course the exams are inherently cumulative. However, exams 1-3 will primarily focus on material covered since the last exam. Exam 4 will be entirely cumulative.

Exams 1-3 will be on Friday 2/26, 3/26 and 4/30. The date and time of the final exam (Exam 4) are yet to be determined.

The exams will be proctored using Zoom. See the document on the course website for details. You will need two electronic devices for the exam. One on which to take the exam and one with a camera for Zoom. If you do not have the requisite devices, contact me as soon as possible.

No makeup exams will be offered after the scheduled exam. If you will miss a scheduled exam it is your responsibility to arrange a time to take the exam prior to the originally scheduled exam.

You will have one week after an exam is handed back to the class to challenge the grading of the exam. No requests after this time period will be entertained. To challenge a grade, you must return to me the exam plus on a separate sheet of paper a clearly written, detailed explanation of your reason for challenging the grade. Except for when correcting simple score calculation errors, the entirety of the exam may be regraded if a regrade is requested.

The points from each exam that contribute to your overall point total will be based on the top 3 test scores using the following formula:

Points received from questions on the exam/(Average of top 3 exam scores) = Exam %

Exam % x 200 = points towards final grade in the class.

Example: If there were 130 total possible question points on an exam but the top three scores were 115, 120, and 125 (average 120), 100% for the exam would be set at 120 question points. If you received 110 question points (91.6%) on the exam you would receive 183.3 points that contribute to your overall grade in the course.

$$110/120 = 91.6\%$$

$$91.6\% \times 200 = 183.3 \text{ points}$$

**Extra Credit:** Up to 50 Points of extra credit can be earned in the class by actively advancing class discussions and by attending the Department of Microbiology seminar series.

**In class participation:** Students who actively contribute to in-class discussions beyond the basics required of the course may be awarded up to 2 pts of extra credit per week.

**Attending microbiology seminars:** Extra credit will be awarded to students who attend the Department of Microbiology's Thursday seminar series. Three points of extra credit may be received per seminar attended. To receive credit, a 1 page summary (1 inch margins 11 point font) of the seminar including the presenter and title must be submitted within 1 week of the seminar. The seminar must be presented by a visiting professor. The Department of Microbiology seminar schedule can be found here: [Microbiology Department \(illinois.edu\)](http://Microbiology.Department(illinois.edu)).

**Academic Integrity:**

You are expected to be familiar with the [UIUC Student Code, Article 1. Part 4. Academic Integrity \(sections 401-406\)](#). Cheating will NOT be tolerated in this course. Any student found cheating could face receiving a failing grade for the course and recommendation for suspension or dismissal from the University.