

BSC 260 MICROBIOLOGY (4 credit hours)

Spring 2020

INSTRUCTOR: Dr. Jan-Ulrik Dahl

OFFICE: SLB 342

OFFICE HOURS: T & Th 11-12 or by appointment (You can make an appointment by going to <https://calendly.com/janulrikdahl> and following the instructions for meeting time)

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EMAIL: jdahl1@ilstu.edu (for any kind of correspondence with the instructor write **BSC260** in the subject line!)

Note: The current COVID-19 outbreak forces us to switch to online teaching. During that time, I also offer office hours via Skype and Zoom. Please request a meeting via email.

LECTURE: T Th 9.35-10:50 am, in Moulton Hall 0210

LABS: (Note that you need to be registered for 1 lab section)

Section 2: MW 12:00-1:50 pm

Section 3: MW 2:00-3:50 pm

Section 4: TTh 2:00-3:50 pm

Section 5: MW 8:00-9:50 am

GENERAL COURSE DESCRIPTION:

Uniqueness, diversity, ecology, molecular biology, and practical applications of microorganisms.

Lecture and lab. Material charge required.

Prerequisites: CHE 220 or CHE 230 and 231 or concurrent registration and BSC 196 and 197.

REQUIRED TEXTBOOK:

Wessner (2e), Microbiology. Wessner, Dupont, Charles, Neufeld (2017).

Note that **you must also sign-up for the WileyPLUS Next Generation online material associated with this textbook**, which will be used in this class. There will be assignments presented that closely relate to the material covered in the lecture. This includes assigned reading, videos, online activities, and online quizzes. This tool also provides additional possibilities that facilitate learning of the course material and give additional feedback to students about their learning progress by self-studying. Visit the course website <http://www.wileyplus.com/go/login> and follow the instructions to set up an account and purchase the access to the textbook. The **Course Section ID is A96799**. The cost to students for WileyPlus (which includes the downloadable Vital Source ebook) is \$108 from the Wiley website. A detailed guideline for the registration can be found in ReggieNet under *Announcements*.

Note:

(1) Access to WileyPLUS Next Generation and the 2nd edition of Wessner is **mandatory**.

(2) The instructor will only recognize one WileyPLUS Next Gen account per student, do not register multiple free trial accounts to circumvent paying for the textbook and WileyPLUS Next Gen.

LECTURES:

The lectures will draw heavily on the assigned readings. **Please read the assignments before attending lecture.** Additional readings from a variety of sources, including primary literature, may be given throughout the semester in both lecture and lab. These additional readings are designed to help you understand the course material and to expose you to literature relevant to this course.

Note: I will **not** give out copies of my slides. Hence, class attendance, while not mandatory, is highly recommended. Please download and install the app **Acadly**, which is **required to participate in in class activities**. Please find the instruction in ReggieNet under Announcements.

There is also the possibility to earn up to **80 extra credit points in exams, a mock defense of the grant proposal, and a pop-up quizz**. I strongly encourage you to take advantage of those.

LEARNING OBJECTIVES:

More detailed learning objectives for each chapter will be announced at the beginning of each chapter in the lecture and posted online on ReggieNet.

- Unit 1&2: Describe the Morphology of bacterial cells
- Unit 3: Describe how eukaryal microorganisms differ from prokaryots
- Unit 4: Explain why archaea and bacteria are grouped in different domains of life
- Unit 5: Define the basic properties of viruses
- Unit 6: Understand the growth requirements of microbes
- Unit 7: Compare DNA replication, transcription, and translation in the different domains of life
- Unit 8: Describe how viruses replicate in bacteria and eukarya
- Unit 9: Describe the process of creating a mutation in bacteria
- Unit 10: Explain the process of gene expression
- Unit 11: Explain how bacteria control gene expression
- Unit 13: Explain how bacteria produce ATP and what it is used for
- Unit 18: Describe the role of microbes in disease
- Unit 19: Describe the different types of immunity
- Unit 20: Understand the concept of adaptive immunity and antibody production
- Unit 21: Explain what defines a bacterium as pathogen
- Unit 24: Understand the different mechanisms by which antibiotics harm bacteria

LECTURE SCHEDULE: The schedule is tentative and subject to change based on class comprehension and understanding of the material. Students are expected to come to class prepared for the day's materials. Any changes will be announced in class or posted ReggieNet.

Month	Date	Day	Topic	Book Chapter	Assignment due
January	14	T	Course Introduction, History, Microbial World	1	Thursday 9.30 am
	16	Th	Microbial World, Bacteria	1, 2	
	21	T	Bacteria	2	
	23	Th	Bacteria	2	Homework 1
	28	T	Cultivating Microorganisms	6	
	30	Th	Cultivating Microorganisms, Eukaryal Microorganisms	6, 3	Homework 2
February	4	T	Eukaryal Microorganisms, Archaea	3, 4	
	6	Th	Exam I	1,2,3,4,6	
	11	T	Viruses	5	
	13	Th	Viral Replication Strategies	8	Homework 3
	18	T	Viral Replication Strategies	8	
	20	Th	Viral Replication Strategies; DNA replication & Gene expression	7, 8	Homework 4
	25	T	DNA replication & Gene expression	7	
	27	Th	DNA replication & Gene expression	7	Homework 5
March	3	T	Bacterial Genetic Analysis	9	
	5	Th	Exam II	5,7,8,9	
	10	T	Spring Break		
	12	Th	Spring Break		
	17	T	No class due to COVID-19		
	19	Th	No class due to COVID-19		
	24	T	Microbial Genomics	10	
	26	Th	Microbial Genomics	10	Homework 6
	31	T	Regulation of Gene Expression	11	
April	2	Th	Regulation of Gene Expression	11	Homework 7
	7	T	Regulation of Gene Expression	11	Exam III - Part I
	9	Th	Metabolism	13	Homework 8
	14	T	Metabolism	13	Exam III - Part II
	16	Th	Infectious Diseases / Bacterial Pathogenesis	18, 21	Homework 9
	21	T	Bacterial Pathogenesis	21	Exam III - Part III
	23	Th	Innate Immunity	19	Homework 10
	28	T	Adaptive Immunity	20	Exam III - Part IV
	30	Th	COVID19 Lecture	24	
May	4	M	Exam Final	comprehensive	

ASSESSMENT:

Exam I	100 points (Date: Feb 6, 9.35 am)
Exam II	100 points (Date: Mar 5, 9.35 am)
Exam III	split into 5 parts w/ 50 points each (Apr 7, Apr 14, Apr 21, Apr 28 at 10.30 am)
Homework/Quiz	100 points
Final	100 points (Date: May 4, 10 AM – 12 PM)
Laboratory	200 points
TOTAL	800 points

GRADING SCALE:

A:	> 90%	>720 points
B:	80 – 89.99%	640 – 719.5 points
C:	70 – 79.99%	560 – 639.5 points
D:	60 – 69.99%	480 – 559.5 points
F:	< 60%	< 480 points

Note:

(1) Make-up exams will **only** be given in cases of University excused absences, extreme emergency or grave illness. Dr.'s note will be required in case of missed exam due to illness. In any case, the students **must notify** the instructor **prior to the exam** in order to be eligible for a make-up exam. In case the instructor will not be notified prior to the exam, the absence will be considered unexcused, no make-up exam will be given.

If you run into any sort of technical issue, please follow the following instructions:

If you experience technical difficulty while completing an assignment in ReggieNet, begin an IT help ticket immediately. You can do this by calling (309)438-4357, using [the IT Help Support Request](#), clicking the link "IT Help" within the course ReggieNet page, or emailing the Technology Support Center immediately at supportcenter@ilstu.edu. You must start this process immediately even if the Support Center is closed at the time of your difficulty. Regardless of how you start, you will be given a ticket number. You should then forward the email with the ticket number to your lecture instructor so they can follow up on the technical difficulty with the Support Center. You will not be given credit for or be allowed to make up missed work due to a technical issue unless you have emailed your lecturer providing the ticket number and the difficulty is found to be a direct result of an ISU-related IT problem.

(2) Homework (including online assignments), and quizzes (announced, unannounced, and/or online) will be used to assess the students learning progress. All assignments will be given a due date and time. **No late submissions will be accepted. If you miss the class, it is still your responsibility to submit the work on time.** Make-up of homework is only be accepted in the case of a verifiable excused absence, which requires notification of the instructor ahead of time and providing appropriate documentation for your absence.

POLICIES:

(1) **Statement on Academic, Research Integrity and Accommodation.** All students are expected to adhere to all ISU policies on academic integrity. Cheating, plagiarism and the failure to adhere to the University's academic dishonesty guidelines will result in score of zero on an exam or assignment and potentially a grade of "F" for the course. Incidents of academic dishonesty will be reported to the University CRR office for appropriate disciplinary action. The ISU policy on academic integrity can be found on the Dean of Student's website.

(2) **Full Denial to record.** Students may not photograph or use audio or video devices to record classroom lectures or discussions or visual materials that accompany them (e.g., lecture slides, whiteboard notes/equations). Students with disabilities who need to record classroom lectures or discussions must contact Student Access and Accommodation Services to register, request and be approved for an accommodation. Students who violate this policy may be subject to both legal sanctions for violations of copyright law and disciplinary action under the University's Code of Student Conduct.

Any student needing to arrange a reasonable accommodation for a documented disability and/or medical/mental health condition should contact Student Access & Accommodation Services at 350 Fell Hall, phone (309) 438-5853, or visit the StudentAccess.IllinoisState.edu

LAB SCHEDULE: Lab sections meet twice each week. Typically experiments will begin during the first lab period and data collected and recorded during the second. The lecture and lab do not synchronize perfectly, but rather is the lab meant to give students hands-on experience with some concepts covered in the lecture.

Note:

(1) The **lab manual for BSC 260 is required** and can be purchased at the Phi Sigma Bookstore in SLB 134 **the first two weeks of school.**

(2) Students are expected to come to lab prepared for the day's material

(3) Required materials for the laboratory include:

- lab coat; notebook for laboratory observations and exercises; **required for lab safety:** closed toe shoes and long hair tied up during laboratory