MCB6937 Bacterial Physiology/ MCB4403 Prokaryotic Cell Structure and Function

University of Florida

Department of Microbiology and Cell Science

COURSE DESCRIPTION: This course explores the structure and physiology of bacterial cells. The principles of energy and biosynthetic metabolism will be examined in aerobic and anaerobic microorganisms. Several current research topics in microbiology will also be covered including microbial proteases, chaperones, chemotaxis, antimicrobial resistance, and adaptations of microbes in extreme environments.

Pre-requisites: CHM 2211; MCB 3020, MCB 3020L with minimum C. It is recommended that BCH 4024 or CHM 4207 be taken before or concurrent.

Credits: 3

Course Instructor:

Mariola J. Edelmann, Room 1048, Microbiology & Cell Science Department, Phone 352-846-0954, medelmann@ufl.edu

Office hours: Tuesday 3-5 PM or by appointment (e-mail preferred), including online students (phone or Skype conferences are used for online students)

CLASS MEETING/EXAM LOCATION:

Tuesdays | Period 9 (4:05 PM - 4:55 PM) Room: Microbiology and Cell Science Bldg. 981, Museum Road, Seminar Room 1044

Thursdays | Period 8 - 9 (3:00 PM - 4:55 PM) Room: Microbiology and Cell Science Bldg. 981, Museum Road, Seminar Room 1044

COURSE LEARNING OBJECTIVES:

- To become an expert on the structure & function of prokaryotic cells
- To gain the concepts and skills needed to understand and critically evaluate research articles that address the structure & function of prokaryotes
- To creatively apply the theories of prokaryotic cell physiology to current problems (e.g. controlling bacterial pathogens)

RECOMMENDED TEXTBOOK:


CLASS LECTURES AND NOTES:

Class lectures and associated notes are available on the University of Florida E-learning in Canvas support services under ‘modules’ in video format with slide notes in pdf format. You can access this account from the LSS homepage (http://lss.at.ufl.edu/) using your GatorLink username and password. To obtain a GatorLink account, you will need to signup with a UF ID number at https://my.ufl.edu/psp/ps_pwd/EMPLOYEE/EMPL/c/UF_PA_GL_ACCT_MGMT.UF_PA_SS_GL_CREATE.GBL
EVALUATION OF LEARNING:

Each weekly topic will include online lectures, plus an assigned classic 'review paper' to read. Class lectures and associated notes will be available on the University of Florida E-learning in Canvas support services under 'modules' in video format. Slides are also available as PDF for download. Exam questions will be drawn from the lectures and review paper as described below. See details of grading scheme for (1) graduate (MCB6937) and (2) undergraduate (MCB4403) sections:

1. **MCB6937 (Bacterial Physiology)**
   Learning will be evaluated based on the following criteria:
   - 500 points (5 exams × 100 points each)
   - 250 points (5 written assignments × 50 points each)
   - +50 points (extra credit, optional)
   - 200 points (summary paper)
   **950 points total**

   Final grades will be based on the following performance standard:
   - 95 - 100 % = A
   - 90 - 94 % = A-
   - 87 - 89 % = B+
   - 84 - 86 % = B
   - 80 - 83 % = B-
   - 77 - 79 % = C+
   - 74 - 76 % = C
   - 70 - 73 % = C-
   - 60 - 69 % = D
   - Less than 60 % = E

2. **MCB4403 (Prokaryotic Cell Structure and Function)**
   Learning will be evaluated based on the following criteria:
   - 500 points (5 exams × 100 points each)
   - 250 points (5 written assignments × 50 points each)
   - +50 points (extra credit, optional)
   **750 points total**

   Final grades will be based on the following performance standard:
   - 95 - 100 % = A
   - 90 - 94 % = A-
   - 87 - 89 % = B+
   - 84 - 86 % = B
   - 80 - 83 % = B-
   - 77 - 79 % = C+
   - 74 - 76 % = C
   - 70 - 73 % = C-
   - 60 - 69 % = D
   - Less than 60 % = E
A. **Exams and assignments for (1) graduate (MCB6937) and (2) undergraduate (MCB4403) students** will complete the following assignments and exams:

**Exams (5 exams × 100 points each):** Five equally weighted exams are scheduled throughout the semester (see course schedule for details on exam times). Each exam is worth 100 points. The exams will focus on the material covered in the class lectures (online). The student should read the textbook chapters noted in parenthesis and print out the lecture notes (in pdf format, online) and then watch the online lectures to enhance understanding of the material. **The exams are multiple choice/short answer and will be administered on Canvas e-learning through Proctor U services [http://www.proctoru.com/index.php].** ProctorU allows you to take your exam on demand or by appointment. All appointments should be made at least 3 days in advance. To make an appointment, create an account at http://go.proctoru.com, then log in, click on the “new exam” link and select the exam, date, and time you desire. You will receive a confirmation email of your reservation at the email address that you provided to ProctorU. Reservations made within 72 hours of your exam are subject to a $5 late reservation fee. Students without an appointment can take their exam on demand within 15, 30 or 45 minutes utilizing “Take it Now.” This premiere feature is designed to give test takers added convenience and only costs $8.75. Late registrations and “Take it Now” are subject to availability.

**Written assignments (5 x 50 points each):** Written assignments related to lecture material are due throughout the semester (see course schedule). For each assignment:
- Choose only one article per assignment for 700-word summary
- All of the assigned literature is available [free of charge] online through Medline or the UF library at http://www.uflib.ufl.edu.
- Read the assigned research article/review.
- Write a brief summary (~700 words) of the article.
- Do not plagiarize (http://web.uflib.ufl.edu/msl/07b/studentplagiarism.html).
- Upload the assignment onto Canvas by no later than 11:59 PM on the date of the deadline. Deadlines are in the “COURSE SCHEDULE.”
- Use one of the following formats only: Word, PDF, or plain text.

For all written assignments, please use the following reference format or similar:


**Endnote Web (provided by UF) and other library management software can be used to help with this** [http://web.uflib.ufl.edu/endnoteweb.html](http://web.uflib.ufl.edu/endnoteweb.html)

**Assignment 1**

**Assignment 2**

**Assignment 3**

**Assignment 4**


**Assignment 5**


**Extra Credit (50 points, optional):** Please provide a comprehensive 1000-word summary that includes a brief discussion of your opinion based on all of the following articles listed:


**B. Only graduate (MCB6937) students are to complete the following assignment:**

**Summary Paper:** The summary paper should be an overview of a topic related to prokaryotic biochemistry, metabolism or cell physiology of interest to you. The paper must be typed (double-spaced with 1-inch margins). The summary paper should include 10 pages. References, a title page, and figures/tables can be included on extra pages. While the figures and tables are optional, they might be helpful in presentation. The aim of this paper is to provide a summary or a review of peer-reviewed research articles published in scientific journals. Although the deadline for choosing a subject of this paper is 10/31, please contact me early in the semester to discuss the topic of your summary paper (including potential references you will use for the final paper) to confirm that your topic is relevant to the subject area. Please upload the paper through Canvas e-learning by no later than DECEMBER 07, 2017. This paper will be scanned by Turnitin for plagiarism. Contact me if you have doubts what constitutes plagiarism.
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<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1</td>
<td>T 08/22</td>
<td>Introduction to course and overview of the syllabus <strong>MEET IN CLASS</strong></td>
<td>(recording will be available for online students one day later)</td>
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<tr>
<td></td>
<td>R 08/24</td>
<td>Structure and Function (Chapter 1)</td>
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<td>2</td>
<td>T 08/29</td>
<td>Structure and Function (Chapter 1) continue</td>
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<td>R 08/31</td>
<td>Growth and Cell Division. Chromosome Replication (Ch 2-3)</td>
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<td>3</td>
<td>T 09/05</td>
<td>Catch up (Ch 1-4). <strong>MEET IN CLASS</strong> (recording will be available for online students one day later)</td>
<td>Assignment 1 – due</td>
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<td></td>
<td>R 09/07</td>
<td>Membrane Bioenergetics (Chapter 4)</td>
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<td>4</td>
<td>T 09/12</td>
<td>Electron Transport, Photosynthesis (Chapters 5-6);</td>
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<td>R 09/14</td>
<td>Catch up (Chapters 4-6) <strong>MEET IN CLASS</strong> (recording will be available for online students one day later)</td>
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<td>5</td>
<td>T 09/19</td>
<td>Exam 1 (Chapters 1-6) <strong>ProctorU</strong></td>
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<td>R 09/21</td>
<td>Regulation of Metabolic Pathways (Chapter 7)</td>
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<td>6</td>
<td>T 09/26</td>
<td>Central Metabolic Pathways (Chapter 8-9)</td>
<td>Assignment 2 – due</td>
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<td>R 09/28</td>
<td>Catch up (Chapters 7-9). <strong>MEET IN CLASS</strong> (recording will be available for online students one day later)</td>
<td>Assignment 2 – due</td>
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<td>7</td>
<td>T 10/03</td>
<td>Exam 2 (Chapters 7-9) <strong>ProctorU</strong></td>
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<td>R 10/05</td>
<td>Metabolism of Lipids, Nucleotides, Amino Acids and Hydrocarbons (Ch 10)</td>
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<td>8</td>
<td>T 10/10</td>
<td>Cell Wall and Capsule Biosynthesis (Chapter 12)</td>
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<td>R 10/12</td>
<td>Catch up (Ch 10-13) <strong>MEET IN CLASS</strong> (recording will be available for online students one day later)</td>
<td>Assignment 3 – due</td>
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<td>9</td>
<td>T 10/17</td>
<td>Inorganic Metabolism (Chapter 13)</td>
<td>Assignment 3 – due</td>
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<td>R 10/19</td>
<td>Exam 3 (Chapters 10, 12-13) <strong>ProctorU</strong></td>
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<td>10</td>
<td>T 10/24</td>
<td>Metabolism (Ch. 14)</td>
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<td>R 10/26</td>
<td>Fermentations (Ch. 15)</td>
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<td>11</td>
<td>T 10/31</td>
<td>Assignment 4 – due</td>
<td><strong>Graduate students: Summary paper subject due</strong></td>
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<td></td>
<td>R 11/02</td>
<td>Catch up (Ch 14 and 15) <strong>MEET IN CLASS</strong> (recording will be available for online students one day later)</td>
<td>Assignment 4 – due</td>
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<td>12</td>
<td>T 11/07</td>
<td>Exam 4 (Chapters 14-15) <strong>ProctorU</strong></td>
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<td></td>
<td>R 11/09</td>
<td>Solute Transport. Protein Transport and Secretion (Chapters 17-18)</td>
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<td>13</td>
<td>T 11/14</td>
<td>Assignment 5 – due</td>
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<td></td>
<td>R 11/16</td>
<td>Responses to Environmental Stress. Responses to environmental Cues. Chemotaxis (Ch. 16, Ch. 19 and Ch. 20)</td>
<td>Assignment 5 – due</td>
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<tr>
<td>14</td>
<td>T 11/21</td>
<td>Catch up (Chapters 16, 19, 20) <strong>MEET IN CLASS</strong> (recording will be available for online students one day later)</td>
<td>Assignment 5 – due</td>
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<td>R 11/23</td>
<td>Thanksgiving</td>
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<td>15</td>
<td>T 11/28</td>
<td>Exam 5 (Chapters 16, 19-20) <strong>ProctorU</strong></td>
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<td></td>
<td>R 11/30</td>
<td>Meet with instructor by appointment to review material if needed</td>
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<td>16</td>
<td>T 12/05</td>
<td>Extra Credit Assignment – due (optional)</td>
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<td>R 12/07</td>
<td><strong>Summary paper due (graduate students only)</strong></td>
<td>**Cumulative Final Exam (optional) <strong>ProctorU</strong></td>
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OTHER INFORMATION:

Attendance and Make-Up Work
Excused absences follow the criteria of the UF Undergraduate Catalogue (e.g., illness, serious family emergency, military obligations, religious holidays) and must be communicated by formal signed documentation to the instructor prior to the missed exam. Appropriate documentation MUST be provided for the absence caused by serious illness, accident, jury duty or death in the immediate family. An alternative time for the exam will be arranged by the instructor. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

COURSE MATERIALS: PLEASE NOTE THAT THE COURSE INSTRUCTOR CONSIDERS ALL UNAUTHORIZED ONLINE POSTING OR DISTRIBUTION OF COURSE MATERIALS A FORM OF ACADEMIC DISHONESTY, AND SUCH ACTIONS WILL BE TREATED ACCORDINGLY. All course materials posted on the course website are assembled and intended for students taking this course ONLY, this is why they are only available for student use from the secure Canvas website. Unauthorized posting of course materials infringes on UF's copyright policies and the "Fair Use" Act. These policies will be vigorously upheld at all times in this course.

Online Course Evaluation Process
Student assessment of instruction helps to improve teaching and learning. Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Academic Honesty
UF students are bound by The Honor Pledge, which states: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently unless the instructor provides explicit permission for you to collaborate on course tasks. Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Software Use:
All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Services for Students with Disabilities
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Campus Helping Resources
Health and Wellness
- U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.
• Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc/Default.aspx, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

**Sexual Assault Recovery Services (SARS)**
- Student Health Care Center, 392-1161.
- University Police Department, 392-1111 (or 9-1-1 for emergencies). http://www.police.ufl.edu/

**Academic Resources**
- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learningsupport@ufl.edu. https://lss.at.ufl.edu/help.shtml.

**Online Course Assistance**
- Each online distance learning program has a process for and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See http://distance.ufl.edu/student-complaints