MCB 4403. Prokaryotic Cell Structure and Function. Credits: 3; Prereq: CHM 2211; MCB 3020, MCB 3020L with C or better. It is recommended that BCH 4024 or CHM 4207 be taken before or concurrent with MCB 4403. 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 quorum sensing, proteases, chaperones, and microbes in extreme environments. Topics in microbial biotechnology will be discussed such as improvement of biological ethanol production and bioremediation.

COURSE INSTRUCTOR: Dr. Julie A. Maupin-Furlow

OFFICE HOURS: Wednesday 8-9 AM or by appointment
Rm. 1153 Microbiology and Cell Science Building (#981)
Phone: 352-392-4095
E-mail: jmaupin@ufl.edu

SCHEDULED CLASS TIMES: Tuesday, Period 9, 4:05 – 4:55 PM
Thursday, Period 8-9, 3:00 – 4:55 PM

DISCUSSION SECTIONS AND EXAM LOCATION:
MCS Room 1011 Computer lab
(Microbiology and Cell Science Building 981)

Exam 4 scheduled for Final Exam Period 11A: 7:30 AM - 9:30 AM, December 11, 2013

COURSE OBJECTIVES:

• To become an expert on the structure and function of prokaryotic cells (bacteria and archaea).
• To gain the concepts and skills needed to understand and critically evaluate research articles that address the physiology and biochemistry of prokaryotes.
• To creatively apply the theories of prokaryotic cell physiology to current problems (e.g. controlling bacterial pathogens, engineering microorganisms for high level production of biofuels and renewable chemicals).
REQUIRED TEXTBOOK:

CLASS LECTURES AND NOTES:
Class lectures and associated notes are available on the University of Florida E-learning in Sakai support services under ‘Lessons’ in MP4 video and 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

ADDITIONAL READINGS:
Research articles and reviews written and published by microbial physiologists (who are experts in their field) will serve as additional readings and are listed below and highlighted in the class schedule. The articles are published in journals available through the UF library or Internet at no charge. These articles are intended to assist you with understanding the course material.

EVALUATION OF LEARNING:
Learning will be evaluated based on the following criteria:
400 points (4 exams × 100 points each)
400 points (4 journal colloquies × 100 points each)
800 points total

Final grades will be based on the following performance standard:

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Exams (4 exams × 100 points each): Four equally weighted exams are scheduled throughout the semester according to the course schedule listed below. Each exam is worth 100 points. The exams will focus on the material covered in class. The student should read the textbook chapters noted in parenthesis prior to lectures and attending class to enhance understanding of the material.

Journal Colloquies (4 x 100 points each): Four equally weighted journal colloquies are scheduled throughout the semester (see course schedule listed below).
For each journal colloquy (100 points each), students must:

a. Write three essay-style questions with appropriate answers that are relevant to the journal colloquy topic. Please be sure that the questions/answers involve critical thinking and are not recitation of facts. Please bring these questions/answers to the scheduled journal colloquy to facilitate in class discussion.

b. Participate in the class discussion of the assigned publication(s) (research article and/or review). Participation points will be based on the student’s ability to lead and discuss aspects of each article and ask/answer questions according.

c. Write a summary and discussion of the assigned publication(s) (at least 700 words double spaced typed, two pages, plus references – DO NOT PLAGIARIZE).

All written assignments and associated questions/answers are due (uploaded onto Sakai) prior to the date scheduled for the in class discussion.

**Journal Colloquy 1 (focus on archaeosortase):**

**Journal Colloquy 2 (focus on regulatory small RNA):**

**Journal Colloquy 3 (focus on inorganic metabolism):**

**Journal Colloquy 4 (focus on biofilms and metabolism):**

**RESEARCH ARTICLES and REVIEWS:**
All research articles and reviews that are assigned for the journal colloquies are available online FREE of charge to UF students through the library at [http://www.uflib.ufl.edu/](http://www.uflib.ufl.edu/) (be sure to sign in via off-campus access if using a computer that is not linked to the UF mainframe). Please see course instructor if you require assistance in gaining free access (you should not have to pay for this service).
COURSE SCHEDULE:

Week 1
R 08/22 Introduction to course / syllabus
(meet in classroom to review material – introduction to course)
Structure and Function (Ch. 1)

Week 2
T 08/27 Structure and Function (Ch. 1, continued) (no meeting scheduled)
R 08/29 Cell Division and Chromosome Replication/Partitioning (Ch 2-3)
(meet in classroom to review material)

Week 3
T 09/03 Membrane Bioenergetics and Electron Transport (Ch 4 - 5)
(no meeting scheduled)
R 09/05 Journal Colloquy 1 (meet in classroom - required)

Week 4
T 09/10 Membrane Bioenergetics and Electron Transport (Ch 4 - 5) (continued)
(no meeting scheduled)
R 09/12 Photosynthesis (Ch. 6)
(meet in classroom to review material)

Week 5
T 09/17 Exam 1 (Chapters 1-6)
R 09/19 The Regulation of Metabolic Pathways (Ch. 7)
(no meeting scheduled)

Week 6
T 09/24 Bioenergetics in the Cytosol (Ch. 8)
(no meeting scheduled)
R 09/26 Central Metabolic Pathways (Ch. 9)
(meet in classroom to review material)

Week 7
T 10/01 Central Metabolic Pathways (Ch. 9)
(no meeting scheduled)
R 10/03 Journal Colloquy 2 (meet in classroom - required)

Week 8
T 10/08 Metabolism of Lipids, Nucleotides, Amino Acids and Hydrocarbons (Ch. 10)
(no meeting scheduled)
R 10/10 Cell Wall and Capsule Biosynthesis (Ch. 12)
(meet in classroom to review material)

Week 9
T 10/15 Exam 2 (Chapters 7- 12)
R 10/17 Inorganic Metabolism (Ch. 13)
(no meeting scheduled)

Week 10
T 10/22 C1 Metabolism (Ch. 14)
(no meeting scheduled)
R 10/24 C1 Metabolism (Ch. 14) (complete)
(meet in classroom to review material)

Week 11
T 10/29 Fermentations (Ch. 15)
(no meeting scheduled)

**Week 12**

- **R 10/31**
  - *Journal Colloquy 3* (meet in classroom - required)

- **T 11/05**
  - Solute Transport (Ch. 17), Protein Transport and Secretion (Ch. 18)
  - (no meeting scheduled)

- **R 11/07**
  - Solute Transport (Ch. 17), Protein Transport and Secretion (Ch. 18) (cont.)
  - (meet in classroom to review material)

**Week 13**

- **T 11/12**
  - *Exam 3 (Chapters 13-18)*

- **R 11/14**
  - Responses to Environmental Stress and Other Cues (Ch. 16 and 19)
  - (no meeting scheduled)

**Week 14**

- **T 11/19**
  - Responses to Environmental Stress and Other Cues (Ch. 16 and 19) (continued)
  - (no meeting scheduled)

- **R 11/21**
  - *Journal Colloquy 4* (meet in classroom - required)

**Week 15**

- **T 11/26**
  - Chemotaxis, Photoresponses, Aerotaxis (Ch. 20)
  - (no meeting scheduled)

- **R 11/29**
  - Thanksgiving break – no class

**Week 16**

- **T 12/03**
  - Microbial Biofilms (Ch. 21) (meet in classroom to review material)

**Week 17**

- **W 12/11**
  - *Exam 4 (Chapters 16, 19, 20, 21)* (Period 11A - 7:30 AM - 9:30 AM)

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**OVERVIEW OF ON-CAMPUS PROCTORED EXAM TESTING:**

All proctored exams will be administered through Sakai and students will take them during period 9 in Miocribology Building Computer Room 1011 (please refer to the course schedule for specific dates and material to be covered in each exam). You MUST be present in the classroom to be able to take the exam. Exams will begin promptly at 4:05 PM and end at 4:55 PM. Students may not leave and re-enter the room once the exam has started. Computers will be provided. Materials such as cell phones, books, notes, etc. are NOT allowed during the exam and should not be readily accessible. When you have completed your exam (submitted through Sakai), you MUST IMMEDIATELY see a proctor to show them your picture ID (Gator1 card, driver’s license, or passport) and sign-out of the exam (printed first and last name, UFID #, and time of exit from the exam room on the ‘exam card’ provided by the instructor) prior to exiting the room.

**EXCUSED ABSENCES and MAKE-UP POLICY:**

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 or journal colloquy. Appropriate documentation MUST be provided for the absence caused by serious illness, accident, jury duty or death in the immediate family. You MUST contact the instructor IN ADVANCE of the missed exam or journal colloquy. An alternative time for the exam or journal colloquy will be arranged by the instructor.
ACADEMIC HONESTY:
As a result of completing the registration form at the University of Florida, every student has signed the following statements: “I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”

UF COUNSELING SERVICES:
Resources are available on-campus for students having personal problems or lacking clear career and academic goals that interfere with their academic performance. These resources include:
1. University Counseling Center, 301 Peabody Hall, 392-1575. Personal and career counseling.
2. Student Mental Health, Student Health Care Center, 392-1171. Personal counseling.
3. Sexual Assault Recovery Services, Student Health Care Center, 392-1161. Sexual assault counseling.

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 Sakai course website are assembled and intended for students taking MCB4403/6937 ONLY, this is why they are only available for student use from the secure Sakai MCB4403/6937 course website. Unauthorized posting of course materials infringes on UF’s copyright policies and the "Fair Use" Act (http://www.generalcounsel.ufl.edu/faq/Copyright.pdf). These policies will be vigorously upheld at all times in this course.

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.
We, the member of the University of Florida, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES:
The Dean of Students Office provides individualized assistance for students with documented disabilities. Services are based upon student need and impact of their specific disability. There is no requirement for any student to self-identify as having a disability. However, students requesting academic accommodations must register with the Dean of Students Office and provide the appropriate documentation verifying their disability. The Dean of Students Office determines what is and is not appropriate documentation. Examples of accommodations that are available to students include, but are not limited to, registration assistance, approval of reduced course load, course substitutions, classroom and examination accommodations, auxiliary learning aids, additional course drops when disability related, and assistance in other
university activities. The designated coordinator for compliance with Section 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) is the Assistant Dean of Students responsible for Students with Disabilities Programs, P202 Peabody Hall, 392-1261 (Voice), or 392-3008 (TDD).

IMPORTANT LIBRARY LINKS:

Library Homepage  http://www.uflib.ufl.edu/  (for all library services and collections)
Course Reserves  https://ares.uflib.ufl.edu/  (for hard copy and/or electronic reserves)
Ask-A-Librarian  http://www.uflib.ufl.edu/ask/  (direct email or online chat for assistance)
IR @ UF  http://ufdcweb1.uflib.ufl.edu/ufdc/?g=ufirg  (to access the UF digital Institutional Repository)
Library Tools and Mobile Apps  http://www.uflib.ufl.edu/tools/  (smart phone apps, RSS feeds, and much more)
Subject Guides/Specialists  http://apps.uflib.ufl.edu/staffdir/SubjectSpecialist.aspx  (by discipline and/or course)

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 for more details.