

Course Information

**Biology MCB 4601
Fall 2018**

Physiology of Archaea and Bacteria

Tues, Thurs; 11-12:15; Torrey Life Sciences 263

Instructor: Kenneth Noll

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Office hours by appointment

Required text: *The Physiology and Biochemistry of Prokaryotes* by White, Drummond and Fuqua

HuskyCT resources

The course HuskyCT site has several links and posted files that you will be required to access. If you are unfamiliar with using HuskyCT, please ask for assistance.

Resources for disability accommodation

The Center for Students with Disabilities (CSD) at UConn provides accommodations and services for qualified students with disabilities. If you have a documented disability for which you wish to request academic accommodations and have not contacted the CSD, please do so as soon as possible. The CSD is located in Wilbur Cross, Room 204 and can be reached at (860) 486-2020 or at csd@uconn.edu. Detailed information regarding the accommodations process is also available on their website at www.csd.uconn.edu.

Guidelines and regulations concerning absences from the final examination, class attendance, discrimination and harassment and the Student Code can be found at provost.uconn.edu/syllabi-references.

<u>Final course grade components</u>	<u>points</u>
Mid-term exams: (Sept. 20, Oct. 16, and Nov. 8) 100 points each	300
<u>Final exam (week of Dec. 10, date and time to be announced):</u>	<u>100</u>
Total (drop lowest mid-term grade)	300

Exams and Absences from Exams

Exams will be short-answer questions covering the material indicated on the syllabus. Midterms will cover material since the previous midterm. The final exam will cover material after the third midterm plus topics from the whole course, focusing on broad concepts that arose repeatedly among the topics of the course. Questions will be drawn from lectures, the textbook, and assigned readings. All exams will be open-book and open-notes. Only the course textbook, any assigned articles, and your notes are allowed. No electronic devices are allowed in the exams, so if you take notes electronically, you will need to print out your notes if you want to use them.

You need to inform Dr. Noll at least a week before scheduled exams or other assignments if you have a potential conflict due to a religious holiday or an extra-curricular/co-curricular activity performed in the interest of the university and/or that supports your scholarly development (*i.e.* scholarly presentations, performing arts, and intercollegiate sports, when the participation is at the request of, or coordinated by, a University official).

It is your responsibility to contact Dr. Noll immediately in the event of an illness or other emergency that affects attendance at a scheduled exam. Vacations, previously purchased tickets or reservations, graduations, social events, misreading the exam schedule and over-sleeping are not viable excuses for missing an exam. If you think that your situation warrants permission to reschedule an exam, you should contact the Dean of Students to request permission to do so.

If you cannot take the final examination at the scheduled time or have “bunched exams,” you

should consult the Bunched Finals/Final Exam Conflict link at iCenter (<http://icenter.uconn.edu>) for instructions. Absence from the final examination not excused in this manner will result in no credit for the final exam.

Extra credit

Throughout the semester, I will occasionally ask a multiple choice question in class and ask those present to write down their answers. The questions can be based on the assigned readings, the previous lecture material or a question that comes up in class. You will get credit for your answer as long as it is a reasonable attempt to answer it correctly. These attempts will count as extra credit. You will get 2 points if you have received credit for all the questions, 1.5 point for 99-75% of them, 1 point for 74-50%, 0.5 for 49-25% and no credit for fewer than 25%.

MCB 4601 Physiology of Archaea and Bacteria

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THIS SYLLABUS IS SUBJECT TO CHANGE DURING THE SEMESTER. FOR THE LATEST VERSION, CHECK THE COURSE HUSKYCT SITE

Topics	Text sections*
A. A primer on microbes	
1. Evolutionary relationships.....	1.1
2. Cell nutrition.....	2.2.3
3. Nitrogen and sulfur assimilation mechanisms.....	13.1, 13.3
B. Cell envelopes and their functions	
1. Cell structure	1.2.2-7
2. Cell wall biosynthesis.....	2.6, 12.1, 12.3
C. Glycolytic pathways as an introduction to energy and metabolite generation	
1. EMP pathway: its variations and regulation.....	Ch. 9
D. Fermentation processes	
1. Free energy in chemical bonds	Ch. 8
2. Fermentation energetics	Ch. 15
3. Commercial fermentations, complex polysaccharides and biofuels	Ch. 15
E. Membrane processes: Electron transport, oxidative phosphorylation, transport	
1. Aerobic and anaerobic electron transport pathways.....	Ch. 5, 19.2.2
2. Membrane energetics.....	Ch. 4
3. Membrane ATPases and ion pumps	Ch. 4
4. Free energy in redox reactions and membranes	Ch. 4
F. Anaerobic natural and commercial ecosystems	
1. Methanogenesis and sulfate-reducing bacteria.....	14.1.4-6, 13.2
2. Gut microbiomes	posted articles
G. Solute transport processes	2.2.4-6, Ch. 17, 19.10.3
H. Phototrophy	
1. Microbial phototrophs, reaction centers and light harvesting	Ch. 6
2. Archaerhodopsin and proteorhodopsins	4.8.4, 4.9, posted article
I. Inorganic compounds as electron donors and acceptors	
1. Chemolithotrophs	13.4
2. Iron respiration	posted articles
3. Direct electron transfer	
4. Green sulfur bacteria consortia.....	posted article

*From the White textbook. Articles will be posted on the HuskyCT site as announced in class.