SYLLABUS –MIBO 4220S-6220S, Bacterial Pathogenesis
MWF 10:10-11:00am, Rm 404B Biological Sciences Bldg

INSTRUCTORS

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OFFICE HOURS

By appointment; please arrange with instructor by e-mail or after class

PREREQUISITES

MIBO3500 (since MIBO3500 has BCMB3100 or BCMB4020 as prerequisites, we will assume you have a reasonable understanding of introductory biochemistry, as well as introductory microbiology)

RESOURCES

Required textbook- *Bacterial Pathogenesis: A Molecular Approach* 3rd edition by Wilson, Salyers, Whitt & Winkler.
Books on reserve at Science Library: (1) *Cellular Microbiology,* Cossart et al., ASM Press, (2) *Bacterial Pathogenesis: A molecular Approach* 3rd edtn. (3) *Basic Immunology,* Abbas & Lichtman, Saunders Press (4) Brock's *Biology of microorganisms*.
eLC- assignments (readings, worksheets, case studies), links to recorded lectures, powerpoints, etc. You are responsible for making sure that you have access to the class eLC site and that you check it regularly for assignments. Let Dr. Karls know immediately if you are unable to access the class eLC site.

LEARNING GOALS

Students will understand:
- How bacteria are integrally related to both human health and disease
- How host defenses respond to bacteria and can contribute to disease
- The process of bacterial pathogenesis from both molecular and physiological perspectives
- Experimental approaches to define bacterial pathogenesis
- The activity of antimicrobials and how resistance arises in pathogens
- Vaccine design
- The mechanisms by which new pathogens emerge

Students will be able to:
- Critically read research literature and interpret experimental data on bacterial pathogenesis
- Design experimental approaches to define virulence factors and pathogenesis pathways
- Identify the bacteria causing disease and predict the progression of disease based on identified virulence factors and/or symptoms
- Prepare for meaningful community engagement and to reflect on the engagement experience
- Effectively communicate with the general public on issues relating to science and health

COURSE ORGANIZATION

This course is divided into 4 units:
I. Innate and acquired immunity & the response to bacteria- Jan 11 to Feb 5 (Exam 1- Feb 5) –Dr. Karls
II. Bacterial virulence strategies: discovery & applications in enteric bacterial pathogens- Feb 8 to Mar 4 (Exam 2- March 18) –Dr. Karls, Dr. Maurer
III. Important bacterial pathogens: pathogenesis, treatment, and prevention- Mar 18 to Apr 18 (Exam 3- April 18) –Dr. Szymanski, Dr. Karls

IV. Emerging & re-emerging bacterial pathogens – **Apr 20 to May 2** (Final Exam- May 6, 8-11am)–Dr. Karls

Note: April 8** and **April 15** are the dates for the **Service-Learning project; both are on a Friday! PLEASE arrange to participate as much as possible from 8:30 am to 1:30 pm on these dates!!

REVISED Exams Dates: In-class exams are on Fri 2/5, Fri 3/18, and Wed 4/18; and the cumulative final exam is Fri 5/6 from 8:00-11:00 am.

Each unit will be detailed on the eLC Course Content Page, including learning objectives, readings, and assignments. YOU are responsible for checking the Course Content Page regularly to get the unit schedules, as they are posted. Ask questions if you are unclear on any assignments or activities!

MIBO6220 or **MIBO4220 Honors:** *Contact Dr. Karls by **January 22*** to arrange for a graduate or Honors project. There is a separate syllabus for Grad/Honors that describes projects and grading.

COURSE ACTIVITIES AND GRADING

Group Work:

The class will be divided into groups of 6 students who will work together on the Service-Learning project, case studies, and discussion of papers. The group work is key to your success in this class; you will work together to pose relevant questions, assess possible answers, critique research papers, and develop creative plans for teaching others what you have learned. These group activities are important for professional development, as well as for gaining higher-level understanding of bacterial pathogenesis.

Group Participation- A rubric will be provided for group members to evaluate their cohorts. Evaluations will be done at quarterly intervals. Each student will receive a group participation grade (5% of your grade); however, if a student receives low evaluations from their group peers, that student's grades on the group work will be lowered accordingly. Instructors will assign the grade based on the evaluations from group members and their observations of group participation.

Service-Learning Project- Dr. Karls is organizing the "Experience UGA" Biological Research program for 9th grade students from Clarke Central and Cedar Shoals High Schools in the Clarke County School District; ~400 students from Clarke Central will visit on Apr 8th and ~300 students from Cedar Shoals will visit on Apr 15th. There will be multiple research venues set up on campus by faculty in Microbiology, Marine Science, Cell Biology, Plant Pathology, Entomology, Biochemistry and Molecular Biology, Poultry Science, Plant Biology, Genetics, Infectious Diseases, Public Health, Science Education, etc. Our class will design a hands-on research demonstration about bacterial pathogenesis, set up and run the demonstrations during both 9th grade visits. (7% of final grade)

Discussion of Case Studies and Research Papers- There will be case studies (clinical/research scenarios that you investigate, solve, and explain) and research articles with associated worksheets assigned to the class. You will work in your group and as a class to understand these studies and research, but for most of these assignments you will turn in your own answers (*in your own words*). Identical answers will be investigated as academic dishonesty.

Individual Work:

Written Work for Case Studies and Research Papers- As described above, the answers for some the case studies and worksheets on the research papers will be prepared individually after discussion in groups. (15% of final grade)

Participation in the Service-Learning Project- Each member of the class will either help run our research venue and/or help host/guide groups of ninth graders to various research venues on campus on both Fri Apr 8th and Fri Apr 15th. The quality of your participation, including reliability, enthusiasm, and professionalism will contribute to your grade. (7% of final grade)

Reflection on Service-Learning Experience- Each student will prepare a reflective essay on how this project affected their understanding of scientific principles, ability to communicate scientific

knowledge, and attitude toward academic outreach, as well as, how the project is likely to impact the community. (3% of final grade)
In Class Quizzes - Brief in class quizzes covering the reading material or assigned questions will be worth 5% of the final grade (grades will be averaged after dropping the lowest score).
Exams: There will be 3 in-class exams (15 pts each) and a cumulative final exam (20 pts).
A missed exam is scored as a zero *unless you have a medical excuse from a doctor that says you could not attend class or an official excuse to attend a University-sanctioned activity. You must have an acceptable excuse (as described above) for every day you do not take the makeup exam. Any falsification of excuses will be reported as a violation of the academic honesty policy. Also, if a student who missed the exam discusses the content of the exam with another student before taking the makeup exam, both students will be reported for violations of the academic honesty policy.*
If you arrive for an in-class or final exam after another student has left the exam period, you may NOT take the exam and cannot take a makeup exam, unless an acceptable excuse is provided.
Exams may have a mix of short answer, discussion, diagrams, multiple choice, fill-in tables, discussion, and short answer. You must use a pen to take the exams or you cannot request a re-grade. *Re-grading must be requested in writing with an explanation of the reason that re-grading is needed; e.g. why you think your answer is correct, points were incorrectly added, etc. You have 7 days after the exam is returned to request a re-grade (give request to Dr. Karls).*

NOTE: Acceptance of late assignments is at the discretion of the instructor and, if the assignment is accepted, the grade will reduced to reflect the tardiness of the submission.

Summary of Grading:
Group Participation- *5% of course grade;* **breakdown**: 4 evaluations by group members and observations by course instructors
Service-Learning Project- *10% of course grade*; **breakdown**: 7% Group Project & Participation on the Experience UGA field trip days, and 3% Reflection Essay
Case Studies and Research Articles- *15% of course grade*; **breakdown:** ~4 case studies, ~3 research article worksheets
In Class Quizzes- *5% of course grade*; **breakdown:** multiple quizzes; lowest quiz grade dropped
Exams- *65% of course grade;* **breakdown:** 3 in class exams (15 pts each) and a final (20 pts)

Grade Scale:
A 100-93, A- 92-90, B+ 89-87, B 86-83, B- 82-80, C+ 79-77, C 76-73, C- 72-70, D+ 69-67, D 66-63, D- 62-60, F <60. Note: grades ending in >.5 round up to the next whole number, e.g. 92.6 rounds to 93, but 92.5 counts as 92.

IMPORTANT INFORMATION REGARDING CONDUCT IN COURSE
All work is individual, i.e. without assistance from anyone, unless otherwise indicated. All academic work must meet the standards contained in "A Culture of Honesty." Students are responsible for informing themselves about those standards before performing any academic work. Acts of dishonesty, such as plagiarism, unauthorized assistance, lying/tampering, and theft (of ideas, materials, etc.), will NOT be tolerated and will be reported immediately to the Office of Academic Honesty.
http://ovpi.uga.edu/academic-honesty/academic-honesty-policy

Your behavior in this class should reflect the **UGA Code of Conduct**; this includes treating your group partners and classmates with respect in your communications on eLC and in class, and fulfilling your responsibilities in group/class projects.
http://conduct.uga.edu/students/rights.html

The Code of Conduct is based on the Pillars of the Arch:
Wisdom challenges us to apply lessons received inside and outside the classroom to our everyday

lives. Wisdom transcends knowledge, embracing curiosity, discovery, and expression throughout our community.
Justice leads us to be fair in our dealings, accountable for our actions, responsible for ourselves, and empathetic for others. Justice requires honesty and celebrates diversity, establishing credibility and integrity for our community and ourselves.
Moderation compels us to act with civility, bolstering our faith in others and the faith others have in us. Moderation accentuates our self-respect, promotes responsible citizenship, and enhances pride in our university."

Computers, smart phones, and electronic pads may only be used for course-related work during class.

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.