Texas A&M University-Corpus Christi
College of Science and Technology

BIOL 4408 - MICROBIAL DIVERSITY AND ECOLOGY
SYLLABUS

FALL 2009

INSTRUCTORS: Lecture: Dr. Joanna Mott
Laboratory: Dr. Stella Doyungan

OFFICE: Dr. Mott: CS 246/ST 319.
Office hours:
W 2.00-4.00 p.m. CS 246, TR 10.45 am-12.15 p.m. ST 319
Additional office hours by appointment.
Phone 825-6024 Email: Joanna.mott@tamucc.edu

Dr. Doyungan ST 308
Office hours: TR at 10:00-12:00 a.m. and 3:00-3:30 p.m.
Additional office hours by appointment
Phone: 825-3686 Email stella.doyungan@tamucc.edu:

MEETS: Lecture: TR 9.30-10.45 a.m. CI 122
Lab: W 1.00-3.55 p.m. CS 231

COURSE DESCRIPTION:
Biodiversity and role of microorganisms in natural environments. Interactions with other micro- and macro- organisms (humans, animals and plants) and with abiotic factors. Unique abilities of microorganisms such as nitrogen fixation and adaptation to extreme environments. Pre-requisite BIOL 2421 or consent of instructor.

STUDENT LEARNING OUTCOMES:
1. Students will be able to summarize the development of the field of microbial ecology and differentiate the roles of various groups of microbes in the ‘environment’.
2. Students will be able to describe the diversity and classification of microorganisms, particularly bacteria and Archaea.
3. Students will be able to explain and compare types of interactions between microbes and other organisms.
4. Students will be able to outline the effects of abiotic factors on survival and distribution of microorganisms
5. Students will be able to perform methods used to study microorganisms from different environments and compose lab reports.
6. Students will be able to discuss current applications of microbes in areas of environmental concern.


LAB MANUAL: None required.
ATTENDANCE:
Students are expected to attend every scheduled class and laboratory meeting, be punctual and exhibit professional behavior. Cell phones should be turned off. The instructor should be notified PRIOR to lab if student will be absent (except in emergency situations). Additional time in lab or return on an extra day is required some weeks due to the nature of microbial growth.

OTHER:
Except in cases where prior arrangements have been made with the instructor or a documented emergency, there is NO provision for making up late work and/or missed quizzes or exams.

EVALUATION:
Lecture: 75% grade
- 3 lecture exams (15% each)
- Final comprehensive exam (20%).
- Additional assignments (10%):
  - Class group assignments (2.5%).
  - Review paper and presentation (7.5%). Each student will be required to complete a review paper as approved by the instructor and present it to the class during the last two weeks of class.

Lab: 25% grade
- Lab reports (16.25%)
- Lab notebook (5%)
- Lab exams (3.75%)

NOTE: Class presentations may be scheduled during dead week.

Evaluation is ongoing to enhance experimental learning, providing the student with feedback about performance in meeting the course objectives. Conferences with the faculty provide opportunities to discuss progress toward the course objectives. Grading is a process of measuring the outcome of learning against standards and assigning a symbol to the level of performance achieved. The final course grade, therefore, rests with the professor.

**All students are expected to conform to college-level standards of ethics, academic integrity, grammar and spelling. In particular, you should review pages 39-40 of the 2009-2010 Undergraduate Texas A&M University-Corpus Christi catalog

Disability and Veterans’ Services: Texas A&M University-Corpus Christi is committed to providing persons with disabilities an equal opportunity to access campus facilities, resources and programs. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. Support and accommodations are also available for returning veterans who experience cognitive and/or physical access issues in the classroom or on campus. Our Office of Disability Services arranges such support and academic accommodations.
To make a request, or for more information, call (361) 825-5816 or visit Driftwood 101. It is important to contact the Office of Disability Services in a timely fashion as it will take time for them to review requests and prepare accommodations and accommodation letters.

**Grade Appeals:** As stated in the Texas A&M University-Corpus Christi University Rules and Procedures (Section B [Academic Program], Part 13 [Students]: 13.02.99.C2 [Student Grade Appeals] and 13.02.99C2.01 [Student Grade Appeal Procedures]), a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is on the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, consult the University Rules and Procedures specified above (accessible through the University Rules and Procedures website at http://www.tamucc.edu/provost/university_rules/index.html). For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

**ACADEMIC ADVISING:** The College of Science and Technology requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. The College's Academic Advising Center is located in Faculty Center 178, and can be reached at 825-6094.
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TENTATIVE COURSE SCHEDULE

Please note that this schedule including exam times, is subject to changes, which will be announced in class. Responsibility to keep up with changes, assignments etc. lies with the student.

WEEK

1
I. Introduction to microbial ecology
   - definition
   - development as a scientific discipline

2-3
II. Diversity of microorganisms

4-5
II. Population interactions
   - among microbial populations
   - between microorganisms and plants
   - between microorganisms and animals

Exam 1

6
III. Microbial communities and ecosystems

7-8
IV. Effects of abiotic factors and environmental extremes on microorganisms

9

Exam 2

10-12
VI. Microorganisms in their natural habitats
   - air
   - water
   - soil

13
VI. Biogeochemical cycling

Exam 3

14-15
VII. Applications of microbiology
   - biodeterioration
   - bioremediation
   - pest control
   - genetic engineering
   - plant disease control

NOTE: Class presentations may be scheduled during the last week of class.

Exact dates of exams will be announced in class at least one week prior to the exam.

Final Exam: Thursday December 15 8.00 – 10.30 a.m.