MICROBIOLOGY FOR SCIENCE MAJORS – BIOL 2321

Instructor: Dr Crystal Kelehear Graham, Assistant Professor
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Office Hours: 12:00-13:00 M, W | 14:00-15:30 Tu, Th | & by appointment

Lecture: 12:30-1:45 PM Tu, Th | WSB 201

Recommended Text for Lecture: Madigan et al. 2017. Brock Biology of Microorganisms. 15th Edition. Pearson.

Course description:

This course will focus on microorganisms and how they impact our everyday lives. As an introductory course in Microbiology, the focus will be on the ubiquity, diversity and evolution of microorganisms, microbial ecology, and medical microbiology. Genetics, genomics and molecular biology will receive less attention as these topics are covered in other courses.

Marketable Skills (MS):

The biology student graduating with a BS in Biology should have the following MS:

1) *Ability to organize, analyze, and interpret data.
2) Proficiency in using presentation software.
3) *Experience in managing time and meeting deadlines.
4) *Ability to speak effectively and write concisely about scientific topics.
5) *Experience in the development of professional email correspondence.

*MS specifically addressed by this course

Student Learning Outcomes (SLO):

The biology student graduating with a BS in Biology should be able to:

*SLO1** demonstrate an understanding of basic biological concepts, including but not limited to evolution via natural selection, cell theory, and the role and function of DNA.
SLO2 demonstrate utilization of various field techniques toward addressing scientific questions in the specific discipline. These field techniques can include, but are not limited to, plant collection and processing, various animal collection techniques, ecological surveying and sampling, and biodiversity indexing.
SLO3 use biological instrumentation to solve biological problems using standard observational strategies.
*SLO4** develop writing skills by summarizing and critiquing recent relevant biological literature.

*SLO specifically addressed by this course

Student Learning Objectives for this Course:

1) Students will outline the differences between prokaryotes and eukaryotes
2) Students will demonstrate an understanding of microbial growth, nutrition and metabolism
3) Students will demonstrate an understanding of microbial ecology and nutrient cycling
4) Students will outline the basic features of bacteria, archaea, fungi, algae, protists and viruses
5) Students will demonstrate an understanding of diseases caused by bacteria, fungi and viruses

Attendance: **Attendance is mandatory.** Lectures will not be posted on Blackboard so students must attend lectures to receive the material. Absences are excused only if students have a documented, university approved excuse (illness, death in the family, etc.). As per SRSU policy, any students missing 20% of lectures (6 lectures) over the course of the semester shall be dropped from the class with an F. **Students cannot miss any exams** unless they have a documented, university-approved excuse; in these cases, the instructor needs to be informed **at least 24 hours in advance** of the exam.

Studying: As a general rule, students should spend 2-3 hours studying for every 1 hour of lecture material. So, for this class, you need to allocate 5-7.5 hours per week to study the lecture material. I recommend reading your notes in conjunction with reading the relevant textbook chapters. Studying is best done shortly after the lecture, not all at once the night before the exam. Look up anything that you do not understand or visit with your instructor during office hours.

Grading: There will be three lecture exams, each of equal contribution to the student grade. Exams will cover the lecture material immediately preceding the exams *i.e.*, there will be no comprehensive final exam. Within the lectures there will be opportunities to gain extra credit by responding to instructor questions: students will be awarded a voucher each time they answer a question correctly in class. The vouchers quantify student participation in lectures. Vouchers can be redeemed in quantities of 5 for an extra point on the ensuing exam (submit your vouchers in quantities of 5 to the instructor as you hand in your exam).

	Weighting
Exam I	25%
Exam II	25%
Exam III	25%
Assignments	25%
TOTAL	100%

Grades: A 90 – 100% **B** 80 – 89% **C** 70 – 79% **D** 60 – 69% **F** 0 – 59%

Class schedule (subject to change):

Date		Topic	Textbook Chapter
14 Jan	Lecture 1	An Introduction to the Course + Microorganisms	1
16 Jan	Lecture 2	Microorganisms & History of Microbiology	1
21 Jan	Lecture 3	Microbial Cell Structure & Function	2
23 Jan	Lecture 4	Microbial Cell Structure & Function (continued)	2
28 Jan	Lecture 5	Microbial Metabolism	3
30 Jan	Lecture 6	Molecular Microbiology	4
4 Feb	Lecture 7	Microbial Growth & Control	5
6 Feb	Lecture 8	Microbial Growth & Control	5
11 Feb	Lecture 9	Viruses	8
13 Feb	**EXAM**	**EXAM I**	
18 Feb	Lecture 10	Microbial Evolution	12
20 Feb	Lecture 11	Diversity of Bacteria	15
25 Feb	Lecture 12	Diversity of Bacteria (continued)	15
27 Feb	Lecture 13	Diversity of Archaea	16
3 Mar	Lecture 14	Diversity of Archaea (continued)	16
5 Mar	Lecture 15	Diversity of Eukaryotic Microorganisms	17
10 Mar	No Class	**Spring Break**	
12 Mar	No Class	**Spring Break**	
17 Mar	Lecture 16	Diversity of Eukaryotic Microorganisms (continued)	17
19 Mar	Lecture 17	Diversity of Eukaryotic Microorganisms (continued)	17
24 Mar	Lecture 18	Diversity of Eukaryotic Microorganisms (continued)	17
26 Mar	**EXAM**	**EXAM II**	
31 Mar	Lecture 19	Microbial Ecology	19-20
2 Apr	Lecture 20	Microbial Symbioses	22
7 Apr	Lecture 21	Microbial Symbioses	22
9 Apr	Lecture 22	Microbial Interactions with Humans	23
14 Apr	Lecture 23	Microbial Interactions with Humans	23
16 Apr	Lecture 24	Diagnostic Microbiology & Vaccines	27
21 Apr	Lecture 25	Bacterial and Viral Diseases	29-31
23 Apr	Lecture 26	Bacterial and Viral Diseases (continued)	29-31
28 Apr	Lecture 27	Bacterial and Viral Diseases (continued)	29-31
30 Apr	No Class	**No class – Dead Day**	
6 May	**EXAM**	**EXAM III (10:15-12:15pm)**	

Note – Lecture topics are subject to change according to course interest, organization, and timing constraints, however the exam dates will remain the same.

Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the Student's responsibility to initiate a request. Please contact Ms. Rebecca Greathouse Wren, M.Ed., LPC-S, Director/Counselor, Accessibility Services Coordinator, Ferguson Hall (Suite 112) at 432.837.8203; mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Students should then contact the instructor as soon as possible to initiate the recommended accommodations.