

SUL ROSS STATE UNIVERSITY - BIOLOGY SR REVIEW 4101 - SPRING SEMESTER 2020

Prof: Jim Zech
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Office Hours: By appointment or W: 9:00 A.M. – 12:00 P.M.; T/TH: 9:00 – 9:30 A.M.; T: 1:00 – 2:00 P.M.

Time and Place: T: 2:00 - 2:50 P.M.; WSB 101 (SRSU); AMS A02 (MC)

- This is designed as a capstone course for biology majors, to help you review for the Biology Assessment Examination. The exam will be based upon, **Raven et al.'s, *Biology*, 12th ed.** In preparation, you will be **required** to give **TWO 15 minute Power Point (*please bring USB to class, DO NOT LOAD*)** presentations, and write **ONE** brief outline from **THREE** of the selected topics listed below, concentrating on the major points.
- Power point should be created with: contrast; not over 5 lines of text; large block font; no patterns; at least **five different** illustrations. **SAVE POWERPOINT OLDER AND NEWER VERSION.** Use mouse as pointer.
- All outlines/handouts must be **E-MAILED** to Dr. Zech no later than **NOON MONDAY** so that copies can be made/sent (**late -5**).
- Upon completion, I will evaluate each presentation [**oral presentations: must include 5 illustrations (@-1); that are read will only receive approx. 1/2 (-15) of the available points**] or outline and may suggest some additions if incomplete.
- When all presentations and outlines have been completed, you will then be eligible to take the Biology Assessment Exam, which is **required for graduation**, scheduled during the final for this class, **Mon, 4 May 2020, from 12:30-2:30 p.m.** The exam will consist of 150 multiple choice questions, taken as equally as possible from the topics below and from the test bank that coordinates with Raven, et al.
- **Your final grade is based upon the successful completion of the presentations and outline combined with your score on the exam (see scale below).**
- **You must have a C or better to pass the class and be eligible for graduation. If a grade of D or F is earned, the entire class will have to be repeated before eligibility to graduate is earned.**
- **For eligibility to take the TEXES (Life Sciences 8-12, #138) exam for teacher certification, completion of the presentations or outlines as well as a score of 80% or better on the exam are required before a student can be bar coded to take the TEXES.**
- Exams are not available for study after completion.
- **NO CELL PHONES;** no feet on furniture; **PHOTOS;** tobacco; **DO NOT LOAD PWERPT ONTO COMPUTER;** etc.
- **University absence policy will be followed.** For this class and this number of credit hours only **three** absences are allowed. After **three** absences, the student will be withdrawn from the class with a failing grade.
- **Failure to complete presentations and/or outlines will prevent eligibility to take the exam, which in turn will prevent graduation and/or bar coding for the TEXES.**
- **Any presentation not given due to an absence, must be rescheduled in order that all presentations are completed and eligibility is met.**
- **Initial Evaluation Exam:** Available and taken during the beginning of the semester.

STUDENT LEARNING OUTCOMES:

SLO1 The student will be able to 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 The student will be able to 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 The student will be able to use biological instrumentation to solve biological problems using standard observational strategies.

SLO4 The student will develop writing skills by summarizing and critiquing recent relevant biological literature.

TOPICS:**OBJECTIVE/FOCUS/SOURCE:**

1. OBJ: Understand the role of key figures and events in the history of biological science.

FOCUS: Includes key events and individuals, and their work in relation to contemporary scientific understanding and applications.

SOURCE: INDEX; JAN 21

2. OBJ: Understand methods of quantification, computation, and measurement.

FOCUS: Includes units of quantification and measurement; types and applications of common measurement equipment; and solving problems involving formulas, experimental data, conversions within the metric system, and conversions between the metric system and the conventional system.

SOURCE: DR. ZECH; JAN 21

3. OBJ: Understand principles of classification, sequencing, and inference.

FOCUS: Classification, categorization, grouping, and selection of various objects according to similarities and differences; inferences, interpolations, and extrapolations from data sets; and ordering and sequencing scientific data according to various criteria.

CHAPTER: 18, 23; JAN 21

4. OBJ: Recognize major cell structures and their function.

FOCUS: Cell structures and their functions, principles of cell theory, and comparisons of different types of cells.

CHAPTERS: 4, 5; JAN 21

5. OBJ: Analyze cell division and reproduction.

FOCUS: Stages of mitosis and meiosis and their relation to chromosome behavior, and relating mitosis and meiosis to growth, repair, and reproduction. CHAPTERS: 10, 11; JAN 28

6. OBJ: Understand respiration and photosynthesis.

FOCUS: Cell respiration and photosynthesis in terms of energy and in terms of cell structures and their functions.

CHAPTERS: 7, 8; JAN 28

7. OBJ: Understand basic biochemistry.

FOCUS: Structure and components of atoms and molecules; the structure and functions of biologically important elements and compounds; chemical equations; and the characteristics of acids, bases, and buffers.

CHAPTERS: 2, 3; JAN 28

8. OBJ: Understand the role of DNA and RNA in the process of protein synthesis.

FOCUS: Roles of DNA and RNA in protein synthesis, and the processes of translation, transcription, and replication.

CHAPTERS: 14, 15; JAN 28

9. OBJ: Apply knowledge of Mendelian genetics.

FOCUS: Terms associated with Mendelian genetics, and using Mendelian genetics to predict the outcomes of monohybrid and dihybrid crosses and crosses involving linked genes and sex-linked genes.

CHAPTER: 12; FEB 4

10. OBJ: Understand genes, chromosomes, and genetic mutations.

FOCUS: Causes, mechanisms, and types of mutations; the effects of mutations on organisms and populations; the functions of genes and chromosomes; and the applications of genetic engineering.

CHAPTERS: 13, 15, 17; FEB 4

11. OBJ: Understand theories of evolution and the origin of life.

FOCUS: Evidence contributing to theories of evolution, factors contributing to genetic stability and change, adaptations as products of evolution, and theories of the origins of life.

CHAPTERS: 1, 21, 22, 25; FEB 4

12. OBJ: Analyze characteristics of viruses, monerans, and protists.

FOCUS: Classification of viruses, monerans, and protists according to their types and characteristics.

CHAPTERS: 26, 27, 28; FEB 4

13. OBJ: Analyze characteristics of fungi, algae, mosses, and ferns.

FOCUS: Classification of fungi, algae, mosses, and ferns according to their characteristics, and the anatomy, physiology, and reproduction of fungi, algae, mosses, and ferns.

CHAPTERS: 28, 29, 31; FEB 11

14. OBJ: Analyze characteristics of gymnosperms and angiosperms.

FOCUS: Classification of gymnosperms and angiosperms according to their types and characteristics, and the structures, functions, and reproduction of gymnosperms and angiosperms.

CHAPTER: 30; FEB 11

15. OBJ: Analyze characteristics of roots, stems, and leaves.

FOCUS: Structure and functions of roots, stems, and leaves.

CHAPTER: 35; FEB 11

16. OBJ: Understand mechanisms of plant reproduction.

FOCUS: Reproductive structures and life cycles of plant, sexual and asexual reproduction, and reproduction in various flowering plants.

CHAPTER: 29, 40; FEB 11

17. OBJ: Analyze characteristics of sponges, cnidarians, and worms.

FOCUS: Classification of sponges, cnidarians, and worms according to their types and characteristics, and the anatomy, physiology, and reproduction of sponges, cnidarians, and worms.

CHAPTER: 33; FEB 18

18. OBJ: Analyze characteristics of mollusks.

FOCUS: Classification of mollusks according to their types and characteristics, and the anatomy, physiology, and reproduction of mollusks.

CHAPTER: 33; FEB 18

19. OBJ: Analyze characteristics of arthropods.

FOCUS: Classification of arthropods according to their types and characteristics, and the anatomy, physiology, and reproduction of arthropods.

CHAPTER: 33; FEB 18

20. OBJ: Analyze characteristics of echinoderms and chordates.

FOCUS: Classification of echinoderms and chordates according to their types and characteristics, and the anatomy, physiology, and reproduction of echinoderms and chordates.

CHAPTERS: 34; FEB 18

21. OBJ: Analyze characteristics of fish.

FOCUS: Classification of fish according to their types and characteristics, and the anatomy, physiology, and reproduction of fish; and comparisons between fish and other vertebrates.

CHAPTER: 34; FEB 25

22. OBJ: Analyze characteristics of amphibians.

FOCUS: Classification of amphibians according to their types and characteristics, and the anatomy, physiology, and reproduction of amphibians; and comparisons between amphibians and other vertebrates.

CHAPTER: 34; FEB 25

23. OBJ: Analyze characteristics of reptiles.

FOCUS: Classification of reptiles according to their types and characteristics, and the anatomy, physiology, and reproduction of reptiles; and comparisons between reptiles and other vertebrates.

CHAPTER: 34; FEB 25

24. OBJ: Analyze characteristics of birds.

FOCUS: Classification of birds according to their types and characteristics, and the anatomy, physiology, and reproduction of birds; and comparisons between birds and other vertebrates.

CHAPTER: 34; FEB 25

25. OBJ: Analyze characteristics of mammals.

FOCUS: Classification of mammals according to their types and characteristics, and the anatomy, physiology, and reproduction of mammals; and comparisons between mammals and other vertebrates.

CHAPTER: 34; MARCH 3

26. OBJ: Understand principles of animal behavior.

FOCUS: Social behavior, territorial behavior, and communication in animals, and comparisons of learned and instinctive behavior.

CHAPTER: 53; MARCH 3

27. OBJ: Understand communities and biomes.

FOCUS: Major biomes and their characteristics; succession in various environments; the flow of energy in food chains and webs; and the relationships among producers, consumers, and decomposers in food chains and webs.

CHAPTERS: 55, 56, 57; MARCH 3

28. OBJ: Understand population dynamics.

FOCUS: Biotic and abiotic factors affecting populations of animals and plants, and the relationship between populations and their habitats.

CHAPTER: 54; MARCH 3

29. OBJ: Understand the effects humans have on the environment.

FOCUS: Conservation practices as they relate to renewable and nonrenewable resources and alternative energy sources; the use of natural resources by humans; sources, mechanisms, and effects of environmental pollution; and human population growth and its consequences.

CHAPTER: 57, 58; MARCH 17

30. OBJ: Understand body (humans and other vertebrates) tissues, organs, and systems.

FOCUS: General characteristics of tissues, organs, and systems and characteristics of specific tissues.

CHAPTER: 41; MARCH 17

31. OBJ: Understand the human digestive system.
 FOCUS: Components, organization, and general functions of the human digestive system, and the structure, location, and functions of digestive organs.
 CHAPTER: 46; MARCH 17
32. OBJ: Understand the human respiratory and circulatory system.
 FOCUS: Components, organization, and general functions of the human respiratory and circulatory system, and the structure, location, and functions of respiratory and circulatory organs.
 CHAPTERS: 47, 48; MARCH 17
33. OBJ: Understand the human endocrine and reproductive systems.
 FOCUS: Components, organization, and general functions of the human endocrine and reproductive system, and the structure, location, and functions of endocrine and reproductive organs.
 CHAPTERS: 44, 51; MARCH 24
34. OBJ: Understand the human muscular, skeletal, and integumentary systems.
 FOCUS: Components, organization, and general functions of the human muscular, skeletal, and integumentary system, and the structure, location, and functions of these systems.
 CHAPTER: 41, 45, 50; MARCH 24
35. OBJ: Understand the human nervous system.
 FOCUS: Components, organization, and general functions of the human nervous system; the structure and location of nervous system organs; and the functions of nervous system components.
 CHAPTER: 42; MARCH 24
36. OBJ: Analyze the stages of vertebrate development.
 FOCUS: Stages of embryological development in various vertebrates, and the prenatal stages of development in humans.
 CHAPTER: 52; MARCH 24
37. OBJ: Apply knowledge of principles of human genetics.
 FOCUS: Relating human genotypes to their phenotypes, the causes and effects of human genetic disorder, and family pedigrees.
 CHAPTER: 13; MARCH 31
38. OBJ: Understand nutrition and its effect on health.
 FOCUS: Types, sources, and characteristics of basic nutrients; the basic food groups and their component foods; basic nutritional needs; and the effects of different eating habits.
 CHAPTER: 46; MARCH 31
39. OBJ: Understand diseases and disorders in humans.
 FOCUS: Diseases and disorders and their symptoms, causes, and transmission mechanisms.
 SOURCE: INDEX; MARCH 31

April 7, 14, 21, and 28: No class, exam preparation; Final Exam, 4 May, 12:30 - 2:30 P.M.



POINT DISTRIBUTION:

Presentations and Outline 3 @ 40 points each =	120 points
Assessment Exam:	150 points
TOTAL POINTS CLASS:	270



GRADING:

Your final grade in Seminar will be determined by the total points you receive divided by the total points possible and the scale listed below. There will be no deviation from this scale.

Grading Scale (percent of total points): A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: 59 and lower



MARKETABLE SKILLS:

1. Students will be able to organize, analyze, and interpret data.
2. Students will be proficient at using presentation software.
3. Students will acquire experience in managing time and meeting deadlines.
4. Students will gain the ability to speak effectively and write concisely about scientific topics.
5. Students will acquire experience and guidance in the development of professional email correspondence.



STUDENTS WITH SPECIAL NEEDS:

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 me, 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.



DISTANCE EDUCATION STATEMENT:

Students enrolled in distance education courses have equal access to the university's academic support services, library resources, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should submit online assignments through Blackboard or SRSU email, which require secure login information to verify students' identities and to protect students' information. The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook.