GRANDE PRAIRIE REGIONAL COLLEGE

Dept. of Science & Technology

COURSE OUTLINE

Winter 2002

ZOOLOGY 2420

Animal Physiology II - Intercellular Communication

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Description:

Organismal communication, coordination and defense are explored. This includes the physiology of the nervous, sensory, motor, muscle, endocrine and immune systems. Examples are used from vertebrates and invertebrates.
Students with credit in PHYSIOLOGY 2100 may not obtain credit in Zoology 2420.

Prerequisites: ZOOLOGY 1200 or BIOLOGY 1070

Textbook: Schmidt-Nielson, K, 1997, Animal Physiology: Adaptation and Environment, 5th ed Cambridge University Press.

Requirements:

Since participation in lectures and completion of assignments are important components of this course, students will serve their best interests by regular attendance at both lectures and seminar sessions. Those who choose not to attend must assume whatever risks are involved. In this regard, your attention is directed to the Academic Guidelines of Grande Prairie Regional College. All assignments must be completed and handed in to the instructor by the date specified. Late assignments will not be marked.

Attendance at all seminar sessions is compulsory. The objective of the seminars is to clarify information that has been presented in class during the previous week. Students are advised to review their notes prior to each seminar and will be graded on their ability to answer assigned seminar questions.

Evaluation:

Seminars	10%
Mid-term Exam I	25%
Mid-term Exam II	25%
Final Exam	40%

TOPIC OUTLINE:

1. Evolution and anatomy of the nervous system
2. Principles of electricity - voltage, current, resistance, capacitance
3. Membrane potential
4. Ion channels and action potentials
5. Propagation of action potentials along axons
6. Synaptic transmission - electrical vs. chemical transmission
7. Synaptic transmission - presynaptic and postsynaptic mechanisms
8. Synaptic transmission - integration and modulation
9. Neural integration
10. Simple reflexes and behaviour
11. Sensory physiology - general principles of transduction
12. Sensory physiology - diversity of receptors
13. Sensory physiology - auditory reception
14. Sensory physiology - visual reception

MID-TERM EXAM I

15. Muscle physiology - sliding filament hypothesis
16. Muscle physiology - properties/regulation of muscle contraction
17. Muscle physiology - metabolic aspects
18. Neuroendocrinology - chemical messengers and regulators
19. Neuroendocrinology - first and second messengers
20. Neuroendocrinology - steroid hormones
21. Neuroendocrinology - non-steroid hormones
22. Neuroendocrinology - classification of hormones
23. Neuroendocrinology - endocrine glands and their hormones
24. Neuroendocrinology - hypothalamus/pituitary pathway
25. Neuroendocrinology - metabolic and developmental hormones
26. Neuroendocrinology - prostaglandins and sex hormones
27. Neuroendocrinology - insect endocrine system

MID-TERM EXAM II

28. The immune system - overview
29. Immunology - the cellular basis of immunity
30. Immunology - the functional basis of antibodies
31. Immunology - the complement system
32. Immunology - T-lymphocytes and cell-mediated immunity
33. Immunology - hypersensitivity (autoimmune disease; allergies)
34. Immunology - applied immunology (AIDS; infectious disease)