

JAN. 18 2001

**GRANDE PRAIRIE REGIONAL COLLEGE**

**Dept. of Science & Technology**

**COURSE OUTLINE**

**Winter 2001**

**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: Hickman, C.P. et al, 2000, Biology of Animals, 7<sup>th</sup> ed, McGraw-Hill Publ. Co. (optional)

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.

Each student will select 2 topics from the list provided and will prepare a written report on each. The first report will be handed in prior to the Mid-term Exam and the second prior to the last class of the semester. The reports will be between 1500 and 2000 words each and will contain information on the topic as described on the attached sheet.

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. Students will also be required to present one of their research papers to the class during the seminar sessions.

<u>Evaluation:</u>	Term papers (2)	20%
	Mid-term Exam I	20%
	Mid-term Exam II	20%
	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
15. MID-TERM EXAM I
  
16. Muscle Physiology - sliding filament hypothesis
17. Muscle physiology - properties/regulation of muscle contraction
18. Muscle physiology - metabolic aspects
19. Neuroendocrinology - chemical messengers and regulators
20. Neuroendocrinology - first and second messengers
21. Neuroendocrinology - steroid hormones
22. Neuroendocrinology - non-steroid hormones
23. Neuroendocrinology - classification of hormones
24. Neuroendocrinology - endocrine glands and their hormones
25. Neuroendocrinology - hypothalamus/pituitary pathway
26. Neuroendocrinology - metabolic and developmental hormones
27. Neuroendocrinology - prostaglandins and sex hormones
28. Neuroendocrinology - insect endocrine system
29. MID-TERM EXAM II
  
30. The immune system - overview
31. Immunology - the cellular basis of immunity
32. Immunology - the functional basis of antibodies
33. Immunology - the complement system
34. Immunology - T-lymphocytes and cell-mediated immunity
35. Immunology - hypersensitivity (autoimmune disease: allergies)
36. Immunology - applied immunology (AIDS: infectious disease)

**TERM PAPERS:**

Students will select a topic from the following list, or from an approved alternative topic, and prepare term papers of between 1500 and 2000 words in length. Each topic will contain information on the following aspects of the disease:

<i>Incidence</i>	<i>Etiology (cause)</i>	<i>Pathogenesis</i>
<i>Clinical features</i>	<i>Diagnosis</i>	<i>Treatment</i>
<i>References</i>		

Term papers should be typed with double spacing. Evaluation of term papers will be based on both content and presentation. Marks will be deducted for mistakes in English grammar and spelling.

**POSSIBLE TOPICS:**

**Neurological Disorders:**

Acute Intermittent Prophyria	Alzheimer's Disease
Myasthenia Gravis	Parkinson's Disease
Huntington's Disease	Multiple Sclerosis
Epilepsy	

**Immune System Disorders:**

DiGeorge Syndrome	Hodgkin's Disease
Chronic Granulomatous Disease	Ataxia Telangiectasia
Wiskott-Aldrich Syndrome	Agammaglobulinemia
Chediak-Higashi Syndrome	

**Musculoskeletal Disorders:**

Rheumatoid arthritis	Ankylosing Spondylitis
Systemic Lupus Erythematosus	Reiter's Syndrome
Polymyositis (Dermatomyositis)	Scleroderma
Polymyalgia Rheumatica	Osteoarthritis

**Endocrine Disorders:**

Kallmann's Syndrome	Pituitary Apoplexy
Acromegaly/Giantism/Dwarfism	Diabetes Insipidus
Thyrotoxicosis	Grave's Disease/Cretinism
Hashimoto's Thyroiditis	Cushing's Syndrome
Conn's Syndrome	Addison's Disease

**Others:**

Werner's Syndrome	Progeria
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