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GRANDE PRAIRIE REGIONAL COLLEGE

DEPT. OF SCIENCE & TECHNOLOGY

COURSE OUTLINE

ZO 2420
Animal Physiology II – Intercellular Communication

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Description: Organismal communication, coordination and defence are explored. This includes the physiology of the nervous, sensory, motor, muscle, endocrine and immune systems. Examples are used from invertebrates and vertebrates.
Students with credit in ZOOLOGY 2410 prior to 1996-97 or PHYSIOLOGY 2100 may not obtain credit in ZO 2420.

Prerequisites: ZOOLOGY 1200 or BI 1070

Text-book: 'Animal Physiology'
Randall, Burggren and French
W.H. Freeman and Compny, New York

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 class and seminar sessions. Those who chose 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 to the instructor by the date specified. Late assignments will not be marked.
Each student will selected two topics from a 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 in the attached sheet.
Attendance at all seminar sessions is compulsory. The objective of the seminars is to clarify information which has been presented in class during the previous week. Students are advised to review their notes prior to each seminar and prepare questions to be answered.

Evaluation:

Term Papers (2)	15%
Quizzes	15%
Mid-term Exam I	20%
Mid-term Exam II	20%
Final Exam	30%

Topic Outline

1. Evolution and anatomy of the nervous system.
2. Principles of electricity.
3. Voltage, current, resistance, capacitance.
4. Membrane potential.
5. Ion channels and action potentials.
6. Propagation of action potentials along axons.
7. Synaptic transmission - electrical vs chemical transmission.
8. Synaptic transmission - pre-synaptic and post-synaptic mechanisms.
9. Synaptic transmission - integration and modulation.
10. Neural integration.
11. Simple reflexes and behaviour.
12. **MID-TERM EXAM I**
13. Sensory physiology - general principles of transduction.
14. Sensory physiology - diversity of receptors.
15. Sensory physiology - auditory reception.
16. Sensory physiology - vision reception.
17. Muscle physiology - sliding filament hypothesis.
18. Muscle physiology - properties/regulation of muscle contraction.
19. Muscle physiology - metabolic aspects.
20. Neuroendocrinology - chemical messengers and regulators.
21. Neuroendocrinology - first and second messengers.
22. Neuroendocrinology - steroid hormones.
23. Neuroendocrinology - non-steroid hormones.
24. Neuroendocrinology - classification of hormones.
25. Neuroendocrinology - endocrine glands and their hormones.
26. Neuroendocrinology - regulation of hormone secretion.
27. Neuroendocrinology - hypothalamus pituitary pathway.
28. Neuroendocrinology - metabolic and developmental hormones.
29. Neuroendocrinology - prostaglandins and sex hormones.
30. Neuroendocrinology - insect endocrine system.
31. **MID-TERM EXAM II**
32. Immunology - the immune system.
33. Immunology - the immune process.
34. Immunology - the cellular basis of immunity.
35. Immunology - the functional basis of antibodies.
36. Immunology - the complement system.
37. Immunology - T-lymphocytes and cell-mediated immunity.
38. Immunology - hypersensitivity (autoimmune disease, allergies)
39. Immunology - applied immunology (AIDS, infectious disease).

TERM PAPERS

Students will select from the following list and prepare term papers of between 1500 and 2000 words in length. Each report will contain information on the following aspects of the disease:

Incidence
Etiology (cause)
Pathogenesis
Clinical features
Diagnosis (laboratory tests)
Treatment
References

Term papers should be typed with double spacing on standard letter size (8" x 11") white paper. Evaluation of term papers will be based on both content and presentation. Marks will be deducted for mistakes both in the use of English and in spelling.

TOPICS

Neurological Disorders:

- Acute Intermittent Porphyria
- Myasthenia Gravis
- Huntington's Disease
- Alzheimer's Disease
- Parkinson's Disease
- Multiple Sclerosis

Immune System Disorders:

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

Musculoskeletal Disorders:

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

Endocrine Disorders:

- Kallmann's Syndrome
- Acromegaly
- Thyrotoxicosis
- Hashimoto's Thyroiditis
- Conn's Syndrome
- Orchitis
- Pituitary Apoplexy
- Diabetes Insipidus
- Grave's Disease
- Cushing's Syndrome
- Addison's Disease

Others:

- Werner's Syndrome
- Cockayne's Syndrome (Progeria)