Biology 458 (WLF 458): VERTEBRATE ENDOCRINOLOGY
Spring 2004
(Last modified on January 16, 2004)

Instructor: Alexander (Sasha) Kitaysky  418 Irving  474-5179
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office hours: by appointment.

Lectures: Mon., Wed. and Fri. 11:45 – 12:45 am, Irving 208.

Final Exam: Wednesday May 5, 8:30 - 10:20 am, Irving 208.

General Course Goals: The lectures and assigned readings are intended to introduce the student to the field of endocrinology in the vertebrate classes. The emphases are on hormonal regulation of wild animals behavior. The course is organized into three parts:

1. General principles of endocrinology (i.e. functions of the endocrine system, hormone structure, synthesis, secretion, action, and basic analytical techniques) will be surveyed.
2. Physiology of the endocrine system, environmental and comparative aspects.
3. Introduction to reproductive endocrinology.

Texts: The primary textbook for Biology 458 (WLF 458) is:


Recommended books:


Tentative course outline. Readings are assigned for each lecture (see syllabus overleaf). During the third part of course, a discussion group with student oral presentations of recent papers in the field of behavioral endocrinology will follow a cycle of two-three lectures. Copies of these papers will be available in Sasha Kitaysky's office for students to sign out, copy themselves and return.
PART ONE: Introduction and Basic Principles of Endocrinology.
(Reading assignment for these lectures: Norris chapters 1-5).

F Jan 15, W Jan 21, Fri Jan 23:
Vertebrates. Why hormones?
Neuroendocrine-endocrine secretions; autocrine, paracrine secretions.
Functions of hormones. Survey of the endocrine systems. Feedback loops;
neuroendocrine reflexes.

M Jan 26, W Jan 28:
Hypothalamo-pituitary systems; pituitary hormones; catecholamine and
peptidergic control; median eminence and portal system; comparative aspects of
the system.
Links between external and internal environment; homeostasis, growth and
development.

F Feb 30, M Feb 2, W Feb 4, F Feb 6:
Types of hormones and their structure; synthesis.
Control of secretion.
Mechanisms of hormone action - receptors, second messengers, conversion to
active forms.

M Feb 9, W Feb 11, F Feb 13:
Metabolism and deactivation of hormones.
Autocrine and paracrine hormones.
Hormones of the immune system.
Atrial natriuretic factor, and other miscellaneous peptides.

M Feb 16:
Adrenal medulla and adrenergic receptors.
(Reading assignment for this lecture: Norris chapter 9).

W Feb 18, F Feb 20:
Basic methods and techniques in endocrinology.
(Reading assignment for this lecture: Norris chapter 3).

M Feb 23:
Midterm Exam 1.
PART TWO: Biology of the Endocrine Systems.

W Feb 25, F Feb 27:
Neurohypophysis.
(Reading assignment for these lectures: Norris chapters 4, 5, 6).

M March 1: Pars distalis, prolactin.
(Reading assignment for this lecture: Norris chapters 4 and 5).

W March 3, F March 5:
Pars distalis, growth hormone and growth factors.
(Reading assignment for these lectures: Norris chapters 4 and 5).

M March 8:
Pars distalis, pars intermedia melanocyte stimulating hormone.
(Reading assignment for this lecture: Norris chapters 4 and 5).

W March 10, F March 12:
Pars distalis, adrenocorticopin and adrenal cortex. Aldosterone-renin-angiotensin,
(Reading assignment for these lectures: Norris chapters 4, 5, 9 and 10).

Spring recess, March 15-21, campus closed on March 19

M March 22, W March 24:
Pars distalis, thyroid, metabolism, thermogenesis, metamorphosis.
(Reading assignment for these lectures: Norris chapters 7, 8 and 14).

F March 26, M March 29:
Parathyroids, ultimobranchials, vitamin D.
(Reading assignment for these lectures: Norris chapter 15).

W March 31:
Gastro-intestinal hormones.
(Reading assignment for this lecture: Norris chapters 13 and 14).

F April 2:
Pancreatic hormones.
(Reading assignment for this lecture: Norris chapters 13 and 14).

M April 5 Midterm exam 2
PART THREE: INTRODUCTION TO REPRODUCTIVE ENDOCRINOLOGY.

Reading assignment for these lectures: Norris chapters 11-12, handouts will be available to supplement the text.

M April 5, W April 7: Life history patterns and reproduction.
Female and male reproductive behavior

F April 9: Oral presentations/discussion of the papers/ field studies of reproductive endocrinology

M April 12, W April 14: Endocrine regulation in females
Endocrine regulation/correlates of parental behavior.

F April 16: Oral presentations/discussion of the papers/ organization and activation of offspring phenotype

M April 19, W April 21: Endocrine regulation in males
Endocrine regulation/correlates of Social behavior

F April 23: Oral presentations/discussion of the papers/ active vs. inactive forms, conversion of hormones; territorial behavior etc.

M April 26, W April 28: Seasonality, Hormones and Behavior

F April 30: Oral presentations/discussion of the papers/ seasonal reproduction, migratory behavior

M May 3: Oral presentations/discussion of the papers/ homeostasis and stress physiology

Final exam. Wednesday May 5, 8:30 - 10:20am, Irving 208.

Note: If you would like to request academic accommodations due to a disability, please contact Disabled Student Services, (2nd fl. Whitaker) fydsso@uaf.edu, 474-7047. If you have a letter from Disabled Student Services indicating you have a disability that requires academic accommodations, please present the letter to us so we can discuss the accommodations you might need for class.
Tentative COURSE EVALUATION

You will be evaluated on the basis of your performance in:

I. Three exams

Exams will test factual knowledge as well as an ability to synthesize and integrate information. The exams will consist of short answers (one to a few sentences). Examples of each exam (questions with answers) will be handed out before the midterms and final.

Midterm 1 (100 points): Covers PART 1 of the course
Midterm 2 (100 points): Covers PART 2 of the course
Final exam* (125 points): Focus primarily on PART 3, but will also include basic principles of the entire course (which you’ll have to know to understand Part 3)

*Note: the final exam might be substituted by a written review of paper, which addresses any subject in the field of behavioral/reproductive endocrinology

II. Oral paper presentation (50 points). Additional handout will be provided with exact instructions on what is expected.

III. Participation in discussions following oral paper presentations (125 points). Additional handout will be provided with exact instructions on what is expected.

Grades: 90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; F<60%

UAF Honor Code – everybody should be in good standing