1. NEUROETHOLOGY: AN INTRODUCTION

Name____________________________________________
NetID____________________________________________
Major ________________Concentration________________

Class Schedule (place an X on existing classes)

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<tr>
<th>Time</th>
<th>Mon</th>
<th>Wed</th>
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Background courses in Neurobiology or related fields

Career goals

L01. Introduction to Neuroethology
1. Course organization and policy
2. Standing on the shoulders of giants
3. Nervous systems
4. Neuroethology example: behavior and neurobiology of the star-nose mole
**Reading Assignments**


Original reprints on course website

courses.cornell.edu/bionb4240

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**Writing Assignments**

Instead of Weekly take home exams:

Due usually on Mondays when schedule permits.

Problem sets over the previous week's material.

25% of course grade.

Late policy

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**Website**

http://courses.cit.cornell.edu/bionb4240/index.htm

**Discussion and Oral Presentation**

Wednesdays 9 AM

- Attendance.
- Journal Club format: original papers from scientific literature.
- Student presentations: 13 Wednesdays x 2 students = 26
  - Discussions 4, 7, 11, 15, 26 (assigned paper)
  - Discussions 19, 23, 30, 34, 38, 42, 46, 52 (student pick)
- Written summary: respond to questions.
- Participation 25%

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**DISCUSSIONS**

SEE COURSE CALENDAR for open dates.

Contact C. Hopkins by email to reserve a date.

Discussion leaders pick Reading Selection and Assignment for that day

Emphasis on current research, important papers, original results (usually not review papers): a “Journal Club”

Student signup starts Monday, Aug 29.

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**The trail is not a trail**

*Gary Snyder*

I drove down the Freeway
And turned off at an exit
And went along a highway

Til it came to a sideroad
Drove up the sideroad
Til it turned to a dirt road
Full of bumps, and stopped.
Walked up a trail
But the trail got rough
And it faded away—
Out in the open,
Everywhere to go.
PROJECTS
NEUROETHOLOGICAL CONCEPTS
First Draft Due: November 18, 2011
FINAL DRAFT: December 5, 2011

WEBSITE
http://courses.cit.cornell.edu/bionb424

NEUROETHOLOGY
A comparative and evolutionary approach to the study of the nervous system and its role in behavior.
A biological approach to the study of behavior and its neural basis.

“Each of us has cause to think with deep gratitude of those who have lighted the flame within us.”
---Albert Schweitzer

“If I have seen a little further it is by standing on the shoulders of Giants.”
---Isaac Newton

Final Exam
No final exam for students who complete 9 of 12 written assignments.
ETHOLOGY

Konrad LORENZ
An early interest in natural history, evolution & palentology
Medical training: comparative anatomy & embryology
Oskar Heinroth (comparative studies of behavior of ducks)

Fixed action patterns: spontaneous, internally generated behavior (not a reflex chain)
Theory of drives: psychohydraulic model
Behavior as an inherited trait, used for taxonomy, phylogenetic analysis.
Social imprinting in geese.

NIKOTINBERGEN
Fixed action pattern (with Lorenz)
A study of Instinct (1951)
Herring Gull Behavior: ethogram of action patterns
Release mechanisms.
Four questions for research on behavior:
• immediate causation
• development
• evolution
• function

ETHOLOGY

Karl von Frisch
Comparative physiology
Dance language of honeybee
Hearing in fish
Sensory biology

Where do nervous systems occur?

Tree of Life

image from [www.tolweb.org](http://www.tolweb.org)
Nerve nets in hydra and jellyfish (Cnidaria)


Centralization

PLATYHELMINTHES

Convoluta

nerve cords

primitive brain

bilateral

nerve cords

Cephalization

ANNELIDA

Ventral nerve tract

Cephalization

ganglia

Star Nose Mole

*Condylura cristata*