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Number: 01-46
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Senate App 5/7/02

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. CONTACT

Contact Person Robert P. Gendron Phone 357 - 2587
Department Biology

II. PROPOSAL TYPE (Check All Appropriate Lines)

COURSE Animal Behavior
Suggested 20 character title

New Course* BIOL 455 Animal Behavior
Course Number and Full Title

Course Revision _____
Course Number and Full Title

Liberal Studies Approval+ _____
for new or existing course Course Number and Full Title

Course Deletion _____
Course Number and Full Title

Number and/or Title Change _____
Old Number and/or Full Old Title

_____ New Number and/or Full New Title

Course or Catalog Description Change _____
Course Number and Full Title

PROGRAM: Major Minor Track

New Program* _____
Program Name

Program Revision* _____
Program Name

Program Deletion* _____
Program Name

Title Change _____
Old Program Name

_____ New Program Name

III. Approvals (signatures and date)

Arden C. Hula 11-05-01
Department Curriculum Committee

W. Barry Ba 12/5/01
Department Chair

[Signature] 01/05/02
College Curriculum Committee

[Signature]
College Dean

+Director of Liberal Studies (where applicable)

*Provost (where applicable)

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LIBERAL STUDIES

Syllabus of Record

I. Catalog Description

BIOL 455 Animal Behavior

**3 class hours
0 lab hours
3 semester hours
(3c-0l-3sh)**

Prerequisites: BIOL 220 or permission

The biological study of animal behavior. Topics include the mechanisms, development, ecology and evolution of behavior.

II. Course Objectives

At the end of the course the student will:

- 1. be familiar with the historical roots underlying the modern study of animal behavior.**
- 2. understand the neurological and physiological basis of animal behavior.**
- 3. understand the role of behavioral patterns in the interaction of organisms with their physical and biotic environment.**
- 4. have an understanding of the evolutionary constraints that shape the behavior of animals.**
- 5. be familiar with some of the more important mathematical models that provide a theoretical framework for much of the current research in this field.**
- 6. be familiar with the primary literature.**
- 7. demonstrate their ability to develop hypotheses and design experiments relating to animal behavior.**
- 8. have improved their technical writing skills through the preparation of a research proposal and various other writing assignments.**

III. Course Outline

The number of hours allocated to each topic is indicated. In addition, there will be two exams of 1.5 hours each or three 1 hour exams.

- | | |
|--|-----------------------|
| <p>A. Historical Perspective
 Ethology and Tinbergen's four questions
 Comparative Psychology</p> | <p>2 hours</p> |
| <p>B. The Acquisition of Behavior
 primarily innate behavioral patterns
 primarily learned behavioral patterns
 imprinting
 the instinct to learn</p> | <p>3 hours</p> |
| <p>C. The Neural Basis of Behavior
 perceptual constraints
 orientation and navigation</p> | <p>2 hours</p> |
| <p>D. The Physiological Basis of Behavior
 the role of hormones
 drives and motivation
 behavioral homeostasis</p> | <p>3 hours</p> |
| <p>E. Behavior Genetics
 methodology
 genetic variation
 environmental interactions</p> | <p>1 hour</p> |
| <p>F. The Evolution of Behavior
 phylogenetic and paleontological analysis
 historical trends</p> | <p>3 hours</p> |
| <p>G. Natural Selection and Behavioral Adaptation
 the optimality approach
 critique of the adaptionist paradigm</p> | <p>3 hours</p> |
| <p>H. Competitive Interactions
 dominance hierarchies
 territoriality</p> | <p>3 hours</p> |
| <p>I. Spatial Behavior
 habitat selection and the ideal free distribution
 dispersal and migration</p> | <p>3 hours</p> |

J. Feeding Behavior optimal foraging theory behavioral adaptations	4 hours
K. Anti-predator Behavior avoiding detection avoiding capture	3 hours
L. Reproductive Behavior mate choice parent-offspring conflicts	3 hours
M. Social Behavior costs and benefits kin selection and altruism game theory and evolutionarily stable strategies the social insects	6 hours

IV. Evaluation Methods

- 64% Exams. There will be two exams (20%) during the semester and a cumulative final (24%). Exams consist of essay and short answer questions.
- 30% Research proposal. Students, in consultation with the instructor, will develop a hypothesis related to some aspect of animal behavior, and design an experiment to test that hypothesis. They will then write a 9-12 page proposal modeled after a National Science Foundation research proposal. The first draft of the proposal, worth 15% of the total grade, will be due at the beginning of the ninth week. The final draft, also worth 15%, will be due two weeks before the end of the semester.
- 6% Three short writing assignments. For each assignment, the student will review and evaluate an article from the primary literature.

Grading Scale:

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	<60%

V. Required Textbooks, Supplemental Books and Readings

Textbooks: Alcock, J. 1998. *Animal Behavior*. 6th Ed. Sinauer Associates, Inc., Sunderland, MA.

McMillan, V. E. 1997. *Writing Papers in the Biological Sciences* (2nd ed). Bedford Books, Boston.

Supplemental readings from the primary literature will be on reserve in the library.

VI. Special Resource Requirements

None

VII. Bibliography

Bateson, Patrick, (ed.). 1983. *Mate Choice*. Cambridge University Press. Cambridge, UK.

Brower, Lincoln P. (ed.) 1988. *Mimicry and the evolutionary process*. University of Chicago Press, Chicago.

Clutton-Brock, T. H., F. E. Guinness and S. D. Albon. 1982. *Red deer: behavior and ecology of two sexes*. University of Chicago Press, Chicago.

Darwin, Charles. 1859. *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*. John Murray, London.

Darwin, Charles. 1872. *The expression of the emotions in man and animals*. John Murray, London.

Dawkins, Marian S., 1998. *Through our eyes only? The search for animal consciousness*. Oxford University Press, Oxford, UK.

Dawkins, Richard. 1976. *The selfish gene*. Oxford University Press, Oxford.

Drickamer, Lee C., Stephen H. Vessey and Doug Meikle. 1996. *Animal Behavior* (4th ed.). Wm. C. Brown Publishers, Dubuque, IA.

Fraenkel, Gotfried S., and Donald L. Gunn. 1961. *The orientation of animals: kineses, taxes and compass reactions*. Dover Publications, New York.

Goodall, Jane. 1986. *The chimpanzees of Gombe: patterns of behavior*. Belknap Press, Cambridge, MA.

Gould, James L. 1982. *Ethology: the mechanisms and evolution of behavior*. W. W. Norton & Co., New York.

Gould, James L., and Carol G. Gould. 1997. *Sexual selection*. W. H. Freeman, New York.

Grier, James W., and Theodore Burk. 1992. *Biology of animal behavior*. Mosby, St. Louis.

Hodgson, Edward S. (ed.) 1990. *Science as a way of knowing VII - neurobiology and behavior*. American Society of Zoologists, Thousand Oaks, CA.

Holldobler, B., and Edward O. Wilson. 1990. *The Ants*. Belknap Press, Cambridge, MA.

Holldobler, Bert, and Martin Lindauer. 1985. *Experimental behavioral ecology and sociobiology*. Sinauer Associates, Sunderland, MA.

- Honore, Erika K., and Peter H. Klopfer. 1990. *A concise survey of animal behavior*. Academic Press, Inc., San Diego.
- Houck, Lynne, and Lee C. Drickamer. (eds.) 1996. *Foundations of animal behavior: classic papers with commentaries*. University of Chicago Press, Chicago.
- Jarman, P. J., and Andrew Rossiter. 1994. *Animal societies: individuals, interactions and organisation*. Kyoto University Press, Kyoto, Japan.
- Klopfer, Peter H. 1962. *Behavioral aspects of ecology*. Prentice-Hall, Englewood Cliffs, NJ.
- Klopfer, Peter H. 1974. *An introduction to animal behavior: ethology's first century*. Prentice-Hall, Englewood Cliffs, NJ.
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- Krebs, John R., and Nicholas B. Davies. 1997. *Behavioural ecology* (4th ed.). Blackwell, London.
- Lorenz, Konrad Z. 1952. *King Solomon's ring*. Thomas Y. Crowell Co., New York.
- Lorenz, Konrad Z. 1953. *Man meets dog*. Penguin Books, Baltimore.
- Lorenz, Konrad Z. 1981. *The foundations of ethology*. Springer-Verlag, New York.
- Lorenz, Konrad Z. 1988. *Here am I – Where are you? The behavior of the greylag goose*. Harcourt Brace Jovanovich, New York.
- Manning, Aubrey, and Marian S. Dawkins. 1998. *An Introduction to animal behavior*, 5th ed. Cambridge University Press. Cambridge, UK.
- Maynard Smith, John. 1982. *Evolution and the theory of games*. Cambridge University Press. Cambridge, UK.
- Michner, Charles D. 1974. *The social behavior of the bees*. Belknap Press, Cambridge, MA.
- Orions, Gordon H. 1980. *Some adaptations of marsh-nesting blackbirds*. Princeton University Press, Princeton.
- Oster, George F., and Edward O. Wilson. 1978. *Caste and ecology in the Social Insects*. Princeton University Press, Princeton.
- Slater, P. J. B., and T. R. Halliday, (eds.). *Behavior and evolution*. Cambridge University Press. Cambridge, UK.
- Staddon, John E. R. 1983. *Adaptive behavior and learning*. Cambridge University Press. Cambridge, UK.
- Staddon, John E. R., and R. H. Ettinger. 1989. *Learning: an introduction to the principles of adaptive behavior*. Harcourt Brace Jovanovich, San Diego, CA.
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- Tinbergen, Niko. 1964. *Social behaviour in animals*, 2nd ed. Science Paperbacks, London.
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- von Frisch, K. 1967. *The dance language and orientation of bees*. Harvard University Press, Cambridge, MA.
- Wilson, Edward O. 1971. *The insect societies*. Harvard University Press, Cambridge, MA.
- Wilson, Edward O. 1975. *Sociobiology: the new synthesis*. Belknap Press, Cambridge, MA.
- Zahavi, Amotz, and Avishag Zahavi. 1997. *The handicap principle*. Oxford University Press, Oxford.

Course Analysis Questionnaire

A: Details of the Course

- A1 This course will be an elective for students in the B.S., B.A., Biology Education and Environmental Health programs, as well as for those minoring in Biology. The course is not intended for inclusion in the Liberal Studies Program.
- A2 This course does not require changes in any other courses or programs in the Biology Department.
- A3 This course has been offered as a Special Topic during the Spring 1994, 1996 and 1998 terms.
- A4 This course is being submitted as a dual-level course. Approval at the graduate level is pending.
- A5 This course is not to be taken for variable credit.
- A6 Courses in animal behavior (also known as ethology) are offered by the biology departments of many, if not most, universities, including 7 SSHE schools.

Bloomsburg University: 50.461 Animal Behavior
 California University of Pennsylvania: Bio 441 Ethology
 East Stroudsburg: Biol 350 Animal Behavior
 Edinboro University of Pennsylvania: Biol 342 Animal Behavior
 Kutztown University: Bio 314 Animal Behavior
 Millersville University: Biol 685 Animal Behavior
 Pennsylvania State University: Biol 429 Animal Behavior
 Shippensburg University: Biol 330 Animal Behavior
 University of Pittsburgh: Biol 1140 Behavioral Ecology

- A7 The course is not recommended or required by any professional society.

B: Interdisciplinary Implications

- B1 This course will be taught by one instructor.
- B2 The Psychology Department offers a course in comparative psychology (PSYC 355) that emphasizes learning, communication and the relationship of animal models to human behavior. The course proposed here looks at animal behavior from a biological (i.e. ecological and evolutionary) point of view without any reference to human behavior. A letter of support from the Psychology Department is attached. This course will

complement, but not significantly overlap with other biology courses such as BIOL 362 – Ecology.

B3 Seats in this course will be available to students in the School of Continuing Education.

C: Implementation

C1 No new faculty are needed to teach this course. This course has already been taught in alternate Spring semesters as a special topics course.

C2 Current lecture space is adequate for this course.

C3 No grant funds are associated with this course.

C4 This course will be offered in alternate Spring semesters.

C5 One section of the course will be offered.

C6 Class size will be determined by the number of students that can be appropriately accommodated in a standard classroom.

C7 Enrollment limits are not recommended by any professional society.

From: Mary Lou Zanich [mlzanich@grove.iup.edu]
Sent: Thursday, February 15, 2001 10:23 AM
To: rgendron@grove.iup.edu
Cc: ML Zanich
Subject: Letter of support

Dr. Gendron,

I have reviewed your proposal for BIOL 455/555 - Animal Behavior. The nature of our disciplines is such that some overlap in interests and topics is inevitable (viz., our PSYC 355 - Comparative Psychology course). Actually, such interdisciplinarity is desirable. Your proposal is an excellent one, and we strongly support its addition to the curriculum. On occasion, we have psychology majors who minor in biology and who have an interest in working with animals. This would certainly be a course I would recommend to them.

Mary Lou Zanich

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