SYLLABUS

Course Code	*Course Num.*	*Course Name*	*Credit Hours*	*Lec.*	*Lab.*	*Tut.*	*Private study*	*Pre-requisites*	*Course Level*	*Teaching Language*
BIO	**455**	**Animal Behavior**	**3**	**2**	**2**	**0**	**5**	**-**	**7**	**English**

A. Course Description

The scientific study of the mechanistic and evolutionary causes of animal behavior, including communication, foraging and anti-predator behavior, spatial behavior, mating behavior, parental care, and social behaviors.

B. Course Outcomes

By the end of this course, the student must be able:

1. Distinguish between the four types of questions that may be asked about animal behavior, and formulate hypotheses of each type to explain a given behavior.
2. Explain how behavioral hypotheses are formulated, the procedures used to test them, and the types of data that can be collected.
3. Understand some of the mechanisms involved in the production of a behavioral sequence by an animal.
4. Understand the role of natural and sexual selection in the evolution of behavior.
5. Explain how these principles can be used to understand human behavior.
6. Explain the relationship between hormones and behavior.
7. State the correlation between genetics and behavior.

C. References:

Required Textbook

- Shawn E.Nordell and Thomas J. Valone(2013) : Animal Behavior; Concepts, Methods, Applications,1e.Oxford University Press.
- Drickamer, Lee C., Stephen H. Vessey, and Elizabeth Jakob. 2002. Animal Behavior: Mechanisms, Ecology, and Evolution. Fifth edition. McGraw-Hill Publishers. ISBN 9780070121997.

Other references:

- Brown R, Payne A, Graham KK and Starks PT. 2012. Prey capture and caste-specific payload capacities in the European paper wasp Polistes dominulus. Insectes Sociaux. 59: 519-525.
- Chadwick V. Tillberg, Michael D.Breed,and Sarah J. Hinners (2007) : Field and Laboratory Exercises in Animal Behavior 1st edition ,ISBN-13:978-0123725820
- Bonnie J.Ploger and Ken Yasukawa (2003):Exploring animal Behavior in laboratory and Field,An Hypothesis-testing Approach to the Development,Causation,Function,and Evolution of Animal behavior 1st edition,ISBN-13978-0125583305.

- Chrastil ER, Getz WM, Euler HA and Starks PT. 2006. Paternity Uncertainty Overrides Sex Chromosome Selection for Preferential Grandparenting. Evolution & Human Behavior. 27: 206-223.
- Dawkins R. (1982) Replicators and vehicles. pp. 45-64 in Current problems in sociobiology, (Kings College Sociobiology Group, ed.) Cambridge Univ. Press.
- Eskenazi BE, Wilson-Rich NS & Starks, PT. (2007) A Darwinian Approach to Huntington's.
- Disease: Subtle Health Benefits of a Neurological Disorder. Journal of Medical Hypotheses 69:1183-1189.
- Gross MR. (1996) Alternative reproductive strategies and tactics: diversity within sexes. Trends Ecol & Evol. 11: 92-98.

Course Website: Google Classroom Webpage: http://www.imamm.org/

D. Topics Outline

D1. Lectures Topics

- ***Background Information***
- ***Introduction: Course Overview; Course Goals; History of Animal Behavior.***
- ***Background Information (1): Evolution & Natural Selection; Fitness &Adaptation; Levels & Units of Selection.***
- ***Proximate Causes of Behavior:***
- ***Behavioral Genetics (1): Nature vs. Nurture; Reaction Norms; Relationship between Genes and Behavior.***
- ***Behavioral Genetics (2): Experimental Methods and Results; Evolution of Behavior.***
- ***Ontogeny of Behavior: Development of behavior in honey bees; Critical Periods; Learning;***
- ***Hormones: The Endocrine System; Hormonal Influences;***
- ***Methods of Studying Hormone-Behavior Systems; Organizational and Activational Effects; Sex Differences and Sexual Behavior.***
- ***Ultimate causes of behavior (focus on individual):***
- ***Habitat Selection: Natal Philopatry and Dispersal; Territoriality.***
- ***Orientation, Migration & Conservation: Definitions; Short and LongDistance Migration; Cues; Applications for conservation (KG).***
- ***Anti-Predator Behavior: Crypsis & Mimicry; Polymorphism;***
- ***Deception Mechanisms; Fighting; Vigilance; Communal Defense.***
- ***Foraging: Feeding Behavior; Optimality Models; Optimal Foraging***
- ***Sex: The Evolution of Sex.***
- ***Sexual Selection (1): Alternative Phenotypes.***
- ***Sexual Selection (2): Intersexual Competition.***
- ***Sexual Selection (3): Intersexual Competition; Mate Choice; Cryptic Mate Choice. 21. Parental Care: Parental Care; Conflicts of Interest; Evolution of Favoritism.***

- ***Mating Systems: Classifications; Evolution of Mating Systems; Mating Systems and Their Ecological Correlates.***
- ***Cooperation & Altruism: Kinship and Reciprocity; Kin Selection.***
- ***Kin Recognition: Mechanism; Example, The Recognition System of Paper Wasps.***
- ***Communication (1): Definition; Channels; Functions; Signals vs. Cues.***
- ***Communication (2): Principals of Communication; Evolution of Honesty.***
- ***Eusociality: The Evolution of Eusociality; Reproductive Skew Models.***
- ***Animal Cognition: Animal Minds.***
- ***Human Sociobiology (1): Adaptations Approach; Mating Systems.***
- ***Human Sociobiology (2): Examples***
- ***Ultimate causes on behavior(focus on human):***
- ***Darwinian Medicine (1): Definition; Applications.***
- ***Darwinian Medicine (2): Examples.***
- ***General Revesion***

- **D2. Laboratories Topics**

  - ***Introduction to practical subjects and Laboratory of Animal behavior.***

  - ***How to observe animal behavior?Learning to describe and quantify animal behavior. Making comparison of behaviors and data recording.***

  - ***Causation: Behavioral Thermoregulation in Field Populations of Amphibian Larvae. Observing and Analyzing Human nonverbal Communication.***

  - ***Foraging: Foraging behavior of ants: an ant's eye view. Bird foraging patterns: experiments using artificial flowers. Honey bee foraging behavior.***

  - ***Development: The effect of prenatal visual stimulation on the imprinting responses of domestic chicks: An Examination of sensitive periods during development***

  - ***Adaptation Birds: A field study of birds adaptation. Seed selection by foraging birds. Competitive behavior of birds at feeders.***

  - ***Avoiding predators: Vigilance and the group –size effect: observing behavior in humans. Vocal defense of nestlings. Diving and skating in Whirligig Beetles: Alternative antipredators responses.***

- ***Agonistic behavior: Competition for breeding resources by burying beetles. Learning to be winners and losers: Agonistic behavior in crayfish.***

- ***Courtship and parental care: Vocal behavior and mating tactics of the spring Peepers: a field exercise in animal behavior. The role of multiple male characters in mate choice by female guppies. Investigating human mate choice using the Want ads.***

- ***Games: Demonstrating strategies for solving the Prisoner's Dilemma. Using empirical games to teach animal behavior in mice.***

- ***A study of some organisms like mice or fish in basins or the behavior of poultry or rabbits are in the animal house or note some camels in farms and their response to some effects, such as food and competition and others.***

- ***General revision***

E. Office Hours

Office hours give students the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class.

F. Exams & Grading System

The semi-official dates of the exams for this course are:

- **Midterm 1:** 6th or 7th week.
- **Midterm 2:** 11th or 12th week.
- **Quizzes & Homework:** During the semester.
- **Lab exam:** 15th week.
- **Final Exam:** 16th week.

Your course grade will be based on your semester work as follows:

Midterm 1: 15 %	**Midterm 2:** 15 %	**Lab exam:** 20 %	**Final Exam:** 40 %
Quizzes, Homework, Attendance & Participation: 10 %			

The grading distribution:

A+	A	B+	B	C+	C	D+	D	F
[95, 100]	[90, 95)	[85, 90)	[80, 85)	[75, 80)	[70, 75)	[65, 70)	[60, 65)	[0, 60)

G. Student Workload

#	Teaching/Learning activities	Contact hours	Frequency	Total contact hours	Self-study hours	Total self-study hours	Student learning time
5	Lecture	2	15	30	2	30	60
2	Tutorial	0	0	0	0	0	0
0	Lab\practical	2	15	30	1	15	45
5	Homework	0	4	0	2	8	8
4	Quiz	0.5	2	1	1	2	3
6	Midterm	1.5	2	3	5	10	13
7	Final Exam	2	1	2	12	12	14
Total				**66**		**77**	**143**

The independent self-study is approximately 5 hours per week.

H. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. ("Immediate family" is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

Executive Rules for Study Regulations and Exams

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