# Psychology 50: Exotic Sensory Systems
## Course Syllabus
## Winter 2013

Prof. Howard C. Hughes
Office: 351 Moore Hall
Email: HCH@Dartmouth.edu
Office hours: M-W 1:00 PM – 2:00 PM or by appointment

Class meetings: M-W-F 11:15 - 12:20, Rm TBA

Course description

Humans have 5 'special' senses (vision, hearing, touch, taste and smell) and a variety of 'internal senses' that provide information about the orientation of our body with respect to gravity (the vestibular system), our posture and the positions of our limbs (kinesthesis), and the internal state of our bodies ('introceptors', such as – baroreceptors (blood pressure), glucoreceptors (hunger), osmoreceptors (thirst), etc). However, some animals posses senses that are unlike anything that humans can experience. Examples include echolocation, celestial and geomagnetic navigational systems, and bioelectricity. This course explores the discovery and operation of these "exotic" senses, highlighting both the similarities and differences with our own more familiar sensory modalities.

Text: ***Sensory Exotica: A World Beyond Human Experience***, by Howard C. Hughes MIT Press, 2001 (Paperback Edition Available Online – both new and used. Copies are also available at Wheelock Books).

**Note:** I encourage students with disabilities, including "invisible" disabilities like chronic diseases or learning disabilities, to discuss them with me so appropriate accommodations can be made. Any student who requires special accommodations must have met with Ward Newmeyer and must inform me of the nature of these accommodations by the end of the second week of classes.

**About this course**

Class meetings: Classes will consist of a mixture of lectures, student presentations and discussions. The first half of the course will be devoted to reading the assigned text, and discussing that material in class. I will lead those discussions, which will serve to clarify and expand upon the topics covered in the text. The second half of the term will be devoted to student research and student class presentations based on that research. The topic for your individual research project is largely up to you, so long as it is appropriate to this course. You can either expand on an exotic sense that is covered in

the text, or you can develop your own topic. **However, *you must get my prior approval of your topic*.** This ***requirement*** is largely for your own protection – I want to be sure you pick a topic that has scientific documentation sufficient to form the basis for a research paper that constitutes one of the major requirements for the course.

Evaluation: Your grade in this course will be based on a ***mid-term take home exam***, your ***research presentation to the class***, and your ***research paper***. A smaller portion of your grade is based on class participation, as described below.

Midterm Exam: This will be a take-home essay exam. The questions will address topics developed in ***Sensory Exotica***. I have chosen an open-book format for this exam because I want to emphasize concepts and understanding more than memorization. However, because it is an open exam, I will hold these essays to high standards. Clarity of exposition, concise prose, and depth of thought will be highly valued. Poor construction, misspellings and other signs of carelessness will not be ignored. The questions will be broad in nature, and will often require comparisons between different sensory modalities. (35% of grade)

Research paper: Each student will write an original paper based on their research topic. The paper will be ***due MARCH 11 at 5 PM*** (this is the day final exams are scheduled for classes that meet M-W-F@11:15). It is expected that the papers will be between 25 and 30 pages in length. Figures are fine, and in fact are encouraged, but they do not count towards the number of pages expected. This may sound long, but I assure you – when you really know a topic, it is not difficult to have 30 pages worth of things to say. (35% of grade)

Student Class Presentations: Given current enrollment estimates, we will probably need to schedule 2 presentations for each class period. If enrollments grow beyond the current level, we will have to make appropriate adjustments. In these classes, the students assume the role of teacher, and the rest of the class (including me) assumes the role of student. Powerpoint presentations are required. The other students will be expected to attend these classes and be attentive and respectful of the speaker. I will evaluate the presentations, and provide feedback to each student. (20% of grade)

Class Participation: This class will be a hybrid between a lecture format and a seminar (discussion) format. As such, much of the success of the class meetings depends upon students being prepared for class, attending classes, and participating in discussions. I don't take attendance, but frequent absences will be noted. Indications that people are not prepared (i.e., have not read the material for each class) will also be noted. Indications of widespread unpreparedness (don't think you can "hide") could result in a change in the midterm format from take home to an in class exam (closed book). (10% of grade)

A note on Academic Honor at Dartmouth: I don't enjoy this part, but I am obligated to remind students of their responsibilities regarding the Dartmouth Honor Code as it applies to this course. The following is an excerpt from the full description of the Academic Honor Principle that can be found in the Organization, Regulations and Courses (ORC, pp. 44-47):

**"1. Examinations. Any student giving or receiving assistance during an examination or quiz violates the Academic Honor Principle." Thus, while the midterm is open book, collaborations between students is not permitted. Do your own work.**

**"2. Plagiarism. Any form of plagiarism violates the Academic Honor Principle. Plagiarism is defined as the submission or presentation of work, in any form, that is not the student's own, without acknowledgement of the source. With specific regard to papers, a simple rule dictates when it is necessary to acknowledge sources. If a student obtains information or ideas from an outside source, that source must be acknowledged. Another rule to follow is that any direct quotation must be placed in quotation marks, and the source immediately cited.**

## Schedule of Classes

WEEK 1: Introduction

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| Mon., Jan. 7 | Welcome to the world of Exotic Senses |
| Wed., Jan. 9 | Some common themes in Sensory Science, Part I |
| Fri., Jan. 11 | Some common themes, Part II |

Reading assignment: Chapters 1, 2, 3 & 4 (Note: reading assignments should be completed prior to the beginning of the next week)

WEEK 2: Biosonar systems

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| Mon., Jan. 14 | Discovery Channel video: Predators of the Wild |
| Wed., Jan. 16 | Open Discussion of biosonar systems in bats |
| Fri., Jan. 18 | Focused Discussion of biosonar systems in bats |

Reading assignment: Chapters 5, 6 & 7

WEEK 3: Biosonar (continued)

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| Mon., Jan. 21 | NO CLASS: Martin Luther King Jr. Day |
| Wed., Jan. 23 | PBS Video: Dolphins with Robin Williams |
| Fri., Jan. 25 | General discussion on marine biosonar |

Reading assignment: Chapters 8,9,10 & 11

WEEK 4: Biological Compasses

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| Mon., Jan. 28 | Discussion: Comparative Biosonar |
| Wed., Jan. 30 | Discussion of Magnetoreception |
| Fri., Feb. 1 | Discussion of solar navigation and the E-vector compass |

Reading assignment: Chapters 12,13,14,15 & 16

WEEK 5: Electroreception: Ancient Animals and An Ancient Sense

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| Mon., Feb. 4 | Video: World of Discovery: Shark Chronicles |
| Wed., Feb. 6 | Giant Squid video/Samples of Cephalopods |
| Fri., Feb. 8 | NO CLASS: Winter Carnival |

Reading assignment: Chapters 17, 18, 19 & 20

**MIDTERM ESSAY QUESTIONS DISTRIBUTED WED. FEBRUARY 6**

WEEK 6: The Scents of Attraction

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| Mon., Feb. 11 | Discussion of electroreception |
| Wed., Feb. 13 | Animal pheromones, yes, but Human pheromones? |
| Fri., Feb. 15 | NO CLASS: Winter Carnival |

WEEK 7: Selection of Research Topics

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| Mon., Feb. 18 | NO CLASS: Finish your take-home essays |
| Wed., Feb. 20 | NO CLASS: Individual Student Meetings on Research Topics<br>We meet in my office (351 Moore) |
| Fri., Feb. 22 | NO CLASS: Individual Student Meeting on Research Topics<br>We meet in my office (351 Moore) |

**TAKE HOME MIDTERM ESSAYS DUE MONDAY, FEB. 18 @ 5 PM**
**(email word document or pdf to HCH@Dartmouth.edu)**

WEEK 8: Student presentations

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| Mon., Feb. 25 | STUDENT PRESENTATIONS |
| Wed., Feb. 27 | STUDENT PRESENTATIONS |
| Fri., March. 1 | STUDENT PRESENTATIONS |

WEEK 9: Student presentations

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| Mon., March 4 | STUDENT CONSULTATIONS |
| Wed., March 6 | STUDENT CONSULTATIONS |
| Fri., March 8 | STUDENT CONSULTATIONS |

NOTE: The student consultations are an opportunity to discuss progress on your research papers

WEEK 10: Finish Writing Research Papers

Professor Hughes available by appt Monday-Wednesday

Thurs., March 14 **FINAL PAPERS ARE DUE**

**RESEARCH PAPERS DUE: 5:00 PM, THURSDAY, MARCH 14, 2013**
**(email .doc or .pdf to HCH@Dartmouth.edu)**