Psy5064    Brain and Emotion    Spring, 2008

Instructor:       Bruce N. Cuthbert, Ph.D., Department of Psychology
                 Office:  N438c Elliott Hall; Phone: 612-626-7569; Email: cuthbert@umn.edu

Instructor Office Hours:    Thursday 11:15-12:15, or by appointment

Teaching Assistants:  Daniel Goldman, goldm076@umn.edu
                      Jason Hall, hallx109@umn.edu

Web Site:    http://www.psych.umn.edu/courses/spring07/cuthbertb/psy5064/

Class Time/Location:   Tuesday-Thursday 9:45-11AM; Elliott Hall, Room N391

Overview:  This course will introduce undergraduates and beginning graduate students to the topic of affective neuroscience. The course will explore contemporary approaches to research on emotional processes, and the systems in the brain that implement emotional behavior. The course includes coverage of affective processes as they are studied both in humans and in animals. Related affective processes such as mood and temperament will also be discussed. Class discussions will emphasize the need to think critically about emotional behavior and subjective feelings as they relate to activity in various parts of the brain. The course will include discussions about the implications of work in affective neuroscience for understanding individual differences in emotional development, how people respond under socially meaningful circumstances, and vulnerability to psychiatric disorders. The format of the course will be a combination of didactic presentations and in-class discussions.

Objectives:  By the end of this course, you should be able to (a) discuss biological theories of emotion, (b) discuss your understanding of how we think about the relationships between brain activity and observed emotional behavior, and (c) write a comprehensive research paper on a topic of interest to you within this framework.

Prerequisite:  Biological Psychology (3061 or 5061, or equivalent) or instructor approval.

Grading:  This course is worth 3 semester credits. Final grades will be weighted as follows:

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes/short papers</td>
<td>45</td>
<td>13%</td>
</tr>
<tr>
<td>Mid-Semester Exam</td>
<td>75</td>
<td>21%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>120</td>
<td>33%</td>
</tr>
<tr>
<td>Paper</td>
<td>120</td>
<td>33%</td>
</tr>
</tbody>
</table>

Regular class attendance and participation in class discussions are expected. Material will be presented in class that is not necessarily represented in the text or readings, for which you will be responsible. Also, some material that is covered in the text and assigned readings will not be discussed in class, but you will be responsible for this material.

Each exam will cover half of the course material, although the final exam will necessarily incorporate concepts and data covered in the first half of the course. Both the midsemester and the final exam will be in short-answer and essay format. You will be provided with a review sheet in advance of each exam to assist you in studying.


Note:  The textbook has been recently updated to paperback format.

Required:  The reading list includes supplemental articles and chapters drawn from various sources. Most readings may be obtained through the U of MN library web site, http://www.lib.umn.edu/, and clicking on the “E-Journals” link in the “SEARCH AND FIND” box. Other articles will be posted to the class web site.
## Course Schedule

<table>
<thead>
<tr>
<th>Dates</th>
<th>Topic</th>
<th>Reading Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SECTION ONE: Introduction, basic concepts, neuroanatomy and neurophysiology fundamentals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 22, 24</td>
<td>What is affective neuroscience?</td>
<td>Panksepp Ch 1, 2</td>
</tr>
<tr>
<td>January 29, 31</td>
<td>Concepts of Brain Emotional Systems</td>
<td>Panksepp Ch. 3, 4</td>
</tr>
<tr>
<td>February 5, 7</td>
<td>Neurochemical maps of the brain</td>
<td>Panksepp Ch. 5, 6</td>
</tr>
<tr>
<td>February 12, 14, 19</td>
<td>Arousal, Sleep, and Attention</td>
<td>Panksepp Ch. 7</td>
</tr>
<tr>
<td><strong>SECTION TWO: Behavior/brain systems in aversive motivation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>February 21, 26, 28</td>
<td>Fear and Anxiety</td>
<td>Panksepp Ch. 11</td>
</tr>
</tbody>
</table>


**March 4**  
**Stress and related hormonal systems**


**March 6, 11**  
**Anger and Aggression**  
**Assignment:** On 3/11, bring in an example from the media (news story, magazine article, etc.) of an instance of human aggressive behavior. Also turn in your own summary and discussion of the article, in terms of the type of aggression represented, and the emotion/brain systems that might have been involved (not less than one page nor more than two pages). Also be prepared to discuss the article in class. (15 points)

Paper topics and a one-paragraph description of the paper's goals due at the end of class on 3/1.

**March 13**  
**Midcourse Exam: Covers all material presented to date.**

**March 18, 20**  
**no class (semester break)**

**SECTION THREE: Behavior/brain systems in appetitive motivation**

**March 25, 27**  
**Approach and anticipation of reward**  
Panksepp Ch. 8


**April 1**  
**Energy: Food intake and regulation**  
Panksepp Ch. 9


April 3, 8  Dysregulated seeking behavior: substance abuse


April 10, 15  Effects of early rearing and maternal care  Panksepp Ch. 13


April 17, 22  Attachment and Loss  Panksepp Ch. 14
Vole paper

April 24  Love and Sexuality  Panksepp Ch. 12

Detailed paper outline due at the end of class on 4/10. Include a sample list of 5-10 references that you plan to discuss in the paper.

SECTION FOUR: Behavior/brain systems for the control and modulation of motivated behavior

April 29, May 1  Basic control processes


May 6, 8  Behavior control processes: Individual differences and clinical implications


**Final Exam** Scheduled for Saturday, May 17, 1:30 – 3:30 p.m.; N391 Elliott Covers all material presented since the midcourse exam.
Final papers are due on May 1, 2008 at the end of the class period. Papers must be submitted in hard copy format. No diskettes or emailed submissions will be accepted. Papers must be written in APA (American Psychological Association) format. Graduate students must write a paper that is approximately 18 pages long, excluding references. Undergraduate students must write a paper that is approximately 12-15 pages long, excluding references.

Frequently asked questions:

What are the requirements for this paper?

Undergraduates. The requirement for this course is somewhat different from the usual “term paper” or survey paper that reviews an area of interest or a theory. One of the most difficult tasks for students (at all levels!) to learn is to think critically about an area of science, distill an appropriate research question or set of questions, devise an appropriate paradigm, design, and statistical analysis to address these questions, and write a coherent manuscript regarding the experiment. The paper requirement for this course is designed to give you some practice and appreciation for this process. The paper is to be written in the format and style of a journal article that might be submitted to an APA (American Psychological Association) or comparable journal (see below regarding APA style). The Introduction should orient the reader to the nature of the article, starting at a relatively broad level and then honing in on the specific research issues within an area to be addressed in the current paper. The Introduction should typically conclude with a description of the experimental design and paradigm. The Methods section describes, as in a typical article, the nature of the research participants, apparatus, procedures, and data reduction/analysis approaches. The Results section may be the most difficult to write, as of course you will not actually be running the experiment and will not have any data. Rather than writing as though you had actual data (with mock statistical results, etc.), you should write this section with a description of how the results would turn out if the outcomes were in accord with your hypotheses, along with a brief statement as to what alternative results might reasonably be expected. Finally, the Discussion section should discuss the Results as in a typical journal article, including an evaluation of the import of potential outcomes that were not in accord with predictions – either null results, or significant but unexpected outcomes. The Discussion should conclude with specific suggestions for how future studies might follow up the current results.

Graduate students. The requirement for this course is to write the Research Plan section of an NIH R03 grant application on a suitable topic related to emotion and the brain. (See http://grants.nih.gov/grants/funding/r03.htm ). The applicant is allowed 10 single-spaced pages for this section; to facilitate comments in grading, you are asked to use the equivalent of 20 pages double-spaces (not including references). The goal of this requirement for graduate students is obvious – to get you thinking about a different kind of scientific writing from a formal manuscript, but one that is quite important!

How many references should I include in my paper?

That question is difficult to answer, because it will depend on your topic and general approach. However, at least 15-20 citations should be provided to demonstrate that you adequately researched your topic.

What is considered a reference?

You should consult journal articles, books, or book chapters. These must be obtained from the library or from journals that provide their articles in electronic format. For journal articles, it is not sufficient to read an abstract. In order to accurately cite the article’s contents, you need to have read the actual paper. Internet searches that refer you to non-peer reviewed sites or articles are not appropriate sources for a research paper at this level of training.

What is plagiarism?

Plagiarism is using someone else’s work without proper citation and/or claiming it as your own. One of the hardest aspects of writing a research paper is to properly reference the ideas that are in it. If you have questions about what constitutes plagiarism, ask. Plagiarism is a form of scholastic dishonesty and will be treated accordingly.

A-F grading will be based on U of MN senate policy (see http://www1.umn.edu/usenate/policies/gradingpolicy.html). Plus/minus grades will be used.

A-range= achievement that is outstanding relative to the level necessary to meet course requirements; 90% or better
B-range=achievement that is significantly above the level necessary to meet course requirements; 80-89%
C-range= achievement that meets the course requirements in every respect; 70-79%
D-range=achievement that is worthy of credit even though it fails to meet fully the course requirements; 60-69%
F= achievement that is not worthy of credit; below 60%
S= achievement that is satisfactory, which is equivalent to a C- or better; 70% or higher

Percentages for the above scheme will reflect the average of the highest three grades on each exam. The instructor reserves the right to adjust the grade distribution if such an adjustment will improve final grades for a majority of students in the course (for example, if the average grade in the course is low and no one scores in the highest range). In no case will such an adjustment make your individual grade worse than what is described above.

Make-Up Exams: Make-up exams will be allowed only in cases of illness, other verified emergency situations or other situations that are sanctioned by U of MN policy (e.g., participation in intercollegiate athletic events, subpoenas, jury duty, military service, and religious observances). Students are responsible for providing documentation to the instructor to verify the reason for the absence. Make-up exams will not be allowed to accommodate travel or other personal plans, so please use the schedule below to plan accordingly. If there is a verifiable emergency that limits your ability to take a scheduled exam, please contact the instructor immediately.

Paper:
Undergraduates. The paper must be in the format of a journal article based on a novel topic related to the course theme and written in APA (American Psychological Association) format; the Results and Discussion sections will be written in terms of what the hypothesized outcomes would be, including a discussion of the implications of potential unanticipated results. Paper topics and a detailed outline, due on the dates listed below, must be approved by the instructor. The final version must be submitted on the last week of class. Five points will be subtracted for each day that the paper is late.

Graduate students. The paper is to be the Research Plan section of an NIH R03 grant application (see link below). Paper topics and a detailed outline, due on the dates listed below, must be approved by the instructor. The final version must be submitted on the last week of class. Five points will be subtracted for each day that the paper is late.

Evaluation of Graduate vs. Undergraduate Students
The reading load will be the same for graduate and undergraduate students, as will the exam requirements. Graduate students are expected to write a longer paper than undergraduates (see below) and will be evaluated more stringently in terms of (a) the paper being written in APA (American Psychological Association) format and (b) the quality of the literature review.

Extra Credit: Final grades are non-negotiable. There will be no opportunities for extra credit. Please do your best on the paper and exams.

Students with Disabilities. If you have any questions regarding disability or reasonable accommodations, make Disability Services your first point of contact. After you make contact with them, Disability Services will contact the instructor to discuss how to best accommodate your needs. The contact information is:
Disability Services, 180 Gateway -- 200 Oak Street SE, University of Minnesota, Minneapolis, MN 55455
(612) 624-4037 (V/TTY)

Student Academic Integrity and Scholastic Dishonesty: All students enrolled in University courses are expected to complete course requirements with fairness and honesty. Failure to do so by seeking unfair advantage over others or by misrepresenting someone else’s work as your own can result in disciplinary action. The University of Minnesota’s Student Conduct Code defines scholastic dishonesty as: submission of false records of academic achievement; cheating on assignments or examinations; plagiarizing; altering, forging, or misusing a University academic record; taking, acquiring, or using test materials without faculty permission; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement. Instructors are obligated to report suspected academic misconduct to their department. Within this course, a student who engages in scholastic dishonesty will be assigned a penalty up to and including an “F” or an “N” for the course. If you have questions regarding the expectations for the paper or for either of the exams, please ask.
Other general expectations of students can be found at:  [http://www1.umn.edu/usenate/policies/classexpectguide.html](http://www1.umn.edu/usenate/policies/classexpectguide.html).

**University of Minnesota Policy on Sexual Harassment.** Sexual harassment by or toward a member of the University community is prohibited. "Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature when (1) submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment or academic advancement in any University activity or program; (2) submission to or rejection of such conduct by an individual is used as the basis for employment decision or academic decisions affecting this individual in any University activity or program; or (3) such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. "Member of the University community" or "University member" mean's any University of Minnesota faculty member, student, or staff member, or other individual engaged in any University activity or program. Department heads, deans, provosts, chancellors, vice presidents, and other supervisors and managers must take timely and appropriate action when they know or should know of the existence of sexual harassment. Other persons who suspect sexual harassment should report it to an appropriate person in their unit or to the University equal opportunity officer. A violation of this policy may lead to disciplinary action up to and including termination of employment or academic dismissal.