UNIVERSITY STUDIES COURSE PROPOSAL FORM: EXISTING COURSES

Course Number and Title: PSYC 4080, Physiological Psychology

Effective Date: Spring 2008 Credit Hours: 4

Request prepared by
Typed Name: Daren C. Jackson, Ph.D. Date: 1/30/07

Title: Assistant Professor Department: Psychology

Telephone: (307) 766-6304 Signature:__________________________

APPROVE FOR UNIVERSITY STUDIES (Mark each that apply, but no more than two) Attach criteria review sheets for each category requested.

Cultural Context:
____ C--Integrated Cultural Context
____ CH--Humanities
____ CS--Social Sciences
____ CA--Arts
____ D--Diversity in the United States
____ G--Global Awareness
____ I--Intellectual Community
____ L--Information Literacy
____ O--Oral Communication
____ P--Physical Activity and Health

Quantitative Reasoning
____ QA--Quantitative Reasoning 1
____ QE--Quantitative Reasoning 2

Natural Sciences
____ SB--Biological Science
____ SP--Physical Science
____ SE--Earth Science
____ V--U.S. and Wyoming Constitutions

Writing
____ WA--Writing 1
____ WB--Writing 2
____ WC--Writing 3

If this course is a 1000 or 2000 level, has it gone through the articulation process with the Wyoming community colleges? If not, please contact Janet Timmerman at 766-3152.

PLEASE ATTACH A DETAILED SYLLABUS FOR THE PROPOSED COURSE.

Department Head Date Dean College Date

Approved for USP __________________ University Studies Committee Date
COLLEGE OF ARTS AND SCIENCES

University Studies Program
A&S Department/Program Resource Commitment Form

Department/Program: Psychology
Course Prefix and Number: PSYC 4080  Credit hours: 4
Title of Course: Physiological Psychology
USP Designation(s) being requested: Natural Sciences --- Biological Sciences (SB)
How many courses from your unit are approved USP offerings? 7
Who is available to teach the course? Daren C. Jackson, Ph.D.

If you are proposing a new course, what course/courses will not be taught or will not be taught as frequently so that the faculty can teach the new course? N/A

If this course exceeds the A&S USP Course limit, please give rationale for USP Course consideration (you must address the uniqueness and necessity of this within your unit and within the college; if your unit offers courses that have the same USP designation(s) explain how this course differs): N/A

Scheduling - Indicate number of sections and seats you plan to offer in each semester, using currently available resources:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Sections</th>
<th>Seats</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>Fall</td>
<td>_____</td>
<td>_____</td>
<td>Every year</td>
</tr>
<tr>
<td>Spring</td>
<td><em><strong>1</strong></em></td>
<td><em><strong>20</strong></em></td>
<td>Every yearXX</td>
</tr>
<tr>
<td>Summer</td>
<td>_____</td>
<td>_____</td>
<td>Every year</td>
</tr>
</tbody>
</table>

Department Head's Signature ____________________________ date __________

By this signature, you are indicating that, if this course is approved for a University Studies Course, you will offer the number of sections and seats indicated above on a regular basis for 5 years using currently available resources.

☑ Approved; forwarded to University Studies Committee
☒ Denied; course returned to department/program

Dean Oliver Walter’s signature ____________________________ date __________
Biological Science (SB)

SB courses include basic and applied study of fundamental principles of biology, including cell structure and function, genetics, ecology, evolution, and organismal biology. These courses may also include applications of biological principles to societal issues such as land use, biodiversity, population and global environmental change, biotechnology, human wellness and disease. These may be either 3 credit (no lab) or 4 credit (with lab) courses.

Course Prefix & Number: PSYC 4080  Credit Hours: 4

Course Title: Physiological Psychology

Please attach a detailed course syllabus that includes the objectives or outcomes for the course and the means to assess the extent that students reach them.

List any prerequisites including math placement level:

6 credit hours in PSYC and one of the following: BIOL 1000; BIOL 1003; BIOL 1010; introductory Zoology course

1. Is this a 4-credit course with lab? Or is it a 3-credit course without lab?
   
   4-credit course with lab
   
   A. If a lab is not included, how will the lecture integrate substantial experimental work using the tools and process of scientific investigation?

   N/A

2. Using information from the syllabus, please describe how this course meets the learning goals (outcomes) and criteria for the SB category.
   
   A. How does this course provide a substantial introduction to the fundamental principles of biological sciences?

   Students in the course learn basic neurophysiological principles: the structure and function of neurons and glial cells and how/why the two interact electrochemically to produce central nervous system (CNS) and peripheral nervous system (PNS) activation. Basic principles of cell biology are reviewed. After a broad overview of structural neuroanatomy and brain morphology, functional neuroanatomy of different neural circuits is emphasized in all subsequent course modules. Evolution is not taught as a separate module; rather, it informs all assigned reading and classroom discussion. A considerable amount of time is spent in the classroom and the laboratory discussing various evolutionary theories concerning WHY the human and non-human animal brain has conserved various
adaptations over time. Genetics is a topic that also permeates several course topics. For example, while reading and discussing the neurobiology of depression and schizophrenia, genetic and environmental factors contributing to the existence of these mental disorders are examined and critically evaluated. Finally, emphasis is placed on the CNS and PNS as one functioning unit which assimilates and collates sensory information, provides the biological machinery by which cognition and emotion influence decision-making, and provides output in the form of motor system function (behavior).

B. Does this course include applications of biological principles to societal issues such as land use, biodiversity, population and global environmental change, biotechnology, human wellness and disease? If so, please describe how these societal issues are addressed.

Issues such as biodiversity, population change, and human wellness and disease are all addressed in this course. Comparative neuroanatomy is often employed as a paradigm to accent biodiversity: discussion in lecture and lab focus on similarities and differences in brain function across existing species, as well as in common ancestors. This is a particular focus during the laboratory sheep brain dissection. Population statistics are used during several lectures on pathological states such as anxiety, depression, schizophrenia, and addictive disorders. Differences in prevalence and incidence rates in these disorders are examined across cultures, and several cultural theories explaining these differences are evaluated.

Similarly, human wellness and disease are addressed in the course from the very first lecture through the end of the course. For example, demyelinating diseases are examined during the neurophysiology module; neurotransmitter dysregulation is examined during the synaptic transmission module; disorders of every sensory modality (e.g., vision, audition, olfaction) and of movement are discussed throughout the course. Finally, as stated above, several lectures focus on frank pathological neurobiological states known to be associated with several mental disorders. However, well-being is not ignored. Multiple lectures cover emotion in detail; these sessions include discussion and readings about patterns of regional brain activation that appear to confer resilience to anxiety and depression. Pharmacological treatments are also covered in this course.

C. How does this course examine how basic scientific concepts in a discipline or disciplines evolve?

The study of neurophysiology and neuroanatomy is largely one of historical advances in theory, method, application, and clinical practice. Specific findings are paired with the time, place, and scientist associated with those findings. After students receive a basic grounding in structural neuroanatomy in the early portion of the course, they are slowly introduced to methods for studying human brain in vivo and non-human animal brain in vitro, and are encouraged to use these examples to think carefully about and articulate the ways in which science has proceeded in a logical, methodical manner. (The “experiments-as-bricks-in-the-wall” metaphor is used in class to focus students’ attention on the fact that no scientific
project occurs in a vacuum, and that all scientists strive to help build and uphold the edifice that is the sum total of our current knowledge in this area.)

D. How does this course introduce students to the scientific approach as practiced in a discipline or disciplines?

The scientific method is employed throughout the course, both in understanding the assigned reading, and in learning to clinically evaluate claims of validation or disproof of theories within physiological psychology. Animal research methods are discussed in detail, as are newer technologies used in human research, such as fMRI, PET, etc. The laboratory provides the best introduction to various methods used in the scientific approach to the study of the intersection of neurobiology and psychology. At least 3 lab sessions of sheep brain dissection are held in the bio labs. Through these sessions, students report an increasing ability to visualize the brain in 3-D space, and report a greater understanding of the inter-relationship between structures in the brain. One lab session is held in the course instructor’s EEG laboratory, where various experimental paradigms examining the neurobiology of cognition and emotion are discussed and demonstrated. In one lab session a standard battery of neuropsychological testing specific to detecting memory dysfunction is presented to students, with a discussion of how each test contributes to our knowledge of different types of memory, and what areas of the brain are associated with these types of memory. Finally, to demonstrate the scientific approach as applied to a clinical setting, Dr. Harlan Ribnik of the Pain Consultants of the Rockies (Cheyenne) addresses the class on the neurobiology of pain, on classic treatment approaches, and on ground-breaking new techniques for treating chronic pain.

E. How does this course address the scope and limitations of the scientific approach?

Students are expected to be able to critically evaluate journal articles; two lab sessions are devoted to small-group discussions of classic articles examining the neural circuitry of emotion and various theories about the association areas of the cortex. Throughout the class, students are cautioned about the dangers inherent in applying the results of non-human animal studies to human populations; for example, prefrontal cortex in the rat is structurally much different from that in the human. Possible confounds in various experimental paradigms utilizing both human and non-human animal samples are stressed when these methods are explained and discussed in class.

F. How does this course address how the discipline or disciplines influence and are influenced by contemporary society (e.g. ethical considerations, social issues)?

Ethical considerations in non-human animal research are discussed in the very first lab section. Students are required to discuss their views on such research, and are required to
respect the rights of other students to express their opinions. Finally, when studying pharmacological treatment of mental disorders such as depression, possible drug side effects are discussed in detail. Students are encouraged to be active participants in their own medical care, and to take special care to know what a doctor is asking them to put in their body.

3. Explain how the assessment method(s) used for this course demonstrate student achievement of the learning outcomes for the SB category. Explain how this assessment might provide information that can be used to improve accomplishment of desired learning outcomes.

There are several methods of assessment used in this course, as outlined in the syllabus. First, three exams are given over the course of the semester, testing both breadth and depth of knowledge. Exams are primarily multiple-choice, with one short-answer essay question. In my experience, basic principles of neurophysiology and functional neuroanatomy are best assessed using a multiple-choice format, as students at this stage lack the ability to write a multi-hour exam consisting of several long-answer essays (which is typical of the kind of exam I write for a graduate student course covering similar material in greater depth). I am quite happy with the current exams, as I have used data from previous exams to replace items with low reliability and/or validity. Quizzes are given weekly in order to facilitate consolidation of material presented in the previous week. These quizzes not only help students know “where they stand” regarding knowledge of the material; they also help me as an instructor gauge the effectiveness of my lectures and lab activities. Finally, awarding points for lab participation ensures the engagements of students in lab activities.

By using a grading system based on the various evaluative components described above, I not only get a good idea of what students are learning; I also know very quickly (with each weekly quiz) what material students are struggling with. I can then devote time in lecture or lab to review of such material. In addition, students complete a mid-term evaluation of their instructor; I have often used comments from the evaluation to change the format of PowerPoint presentation, lectures, and discussions in lab.

4. Does this course include an embedded USP component?
No

A. If yes, which embeddable component is included, and are the outcomes of the embedded component appropriately addressed in the course proposal?
N/A

5. What other factors should the committee consider?
Physiological Psychology
PSYC 4080 – Spring 2006 (Lecture)
Tuesdays and Thursdays: 9:35 – 10:50
Biological Sciences, rm. 310

Instructor: Daren Jackson
Office: 123 Biological Sciences
Office Hours: Tuesday, 11:00-12:00; 1:00-2:00/Thursday, 11:00-12:00
Phone: 766-6304
E-mail: daren@uwyo.edu (E-mail is the best way to contact me. Unless I am out of town [and sometimes even then] I will make every effort to respond within 24 hours.)

Teaching Asst.: Nick Schwab
Office: 209 Biological Sciences
Office Hours: Monday, 1:00-2:00/Wednesday, 10:00-11:00
E-mail: schwab81@uwyo.edu

Course Prereqs: 6 credit hours in PSYC AND BIOL 1000 or 1003 or 1010 or introductory Zoo course


TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>DATE</th>
<th>CLASS ACTIVITIES</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 10</td>
<td>Welcome and Introduction to Class</td>
<td>Show up</td>
</tr>
<tr>
<td>January 12</td>
<td>Nerve cells</td>
<td>Read Kalat, pp 493-498; 29-38</td>
</tr>
<tr>
<td>January 17</td>
<td>Nerve impulses</td>
<td>Read Kalat, pp 39-51</td>
</tr>
<tr>
<td>January 19</td>
<td>Synaptic transmission</td>
<td>Read Kalat, pp 53-71</td>
</tr>
<tr>
<td>January 24</td>
<td>Synaptic transmission Review</td>
<td>Read Kalat, pp 29-71 (again)</td>
</tr>
<tr>
<td>January 26</td>
<td>Neuroanatomy I</td>
<td>Read Kalat, pp 73-93</td>
</tr>
<tr>
<td>January 31</td>
<td>Neuroanatomy II</td>
<td>Read Kalat, pp 94-105</td>
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<tr>
<td>February 2</td>
<td>No Class—INS Conference</td>
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<tr>
<td>February 7</td>
<td>Neural development and plasticity</td>
<td>Read Kalat, pp 107-141</td>
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<tr>
<td>February 9</td>
<td>Exam Review</td>
<td></td>
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<tr>
<td>February 14</td>
<td>EXAM ONE</td>
<td></td>
</tr>
<tr>
<td>February 16</td>
<td>Vision I</td>
<td>Read Kalat, pp 143-161</td>
</tr>
<tr>
<td>February 21</td>
<td>Vision II</td>
<td>Read Kalat, pp162-185</td>
</tr>
<tr>
<td>February 23</td>
<td>Hearing</td>
<td>Read Kalat, pp 187-196</td>
</tr>
<tr>
<td>February 28</td>
<td>Other sensory systems</td>
<td>Read Kalat, pp197-218</td>
</tr>
<tr>
<td>March 2</td>
<td>Movement</td>
<td>Read Kalat, pp 227-259</td>
</tr>
<tr>
<td>March 7</td>
<td>Sleep and wakefulness</td>
<td>Read Kalat, pp 261-291</td>
</tr>
<tr>
<td>March 9</td>
<td>Regulation of temperature, thirst, and hunger</td>
<td>Read Kalat, pp 293-321</td>
</tr>
<tr>
<td>March 14</td>
<td>No Class—Spring Break</td>
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</tbody>
</table>
March 16 | No Class—Spring Break
March 21 | Reproduction
March 23 | Exam Review
March 28 | EXAM TWO
March 30 | Emotion I
April 4 | Emotion II
April 6 | Learning and Memory I
April 11 | Learning and Memory II
April 13 | Psychopathology I
April 18 | Psychopathology II
April 20 | Guest Speaker: Dr. Harlan Ribnik
April 25 | Social Neuroscience
April 27 | Final Exam Review
Tuesday, May 2 | FINAL EXAM, 10:15 – 12:15

COURSE DESCRIPTION

After completing this course, you should have a reasonably thorough knowledge of human neuroanatomy and an in-depth understanding of synaptic transmission. We will focus primarily on the central nervous system (CNS), although we will also explore relations between CNS and peripheral nervous system. All major sensory systems, as well as the motor system, will be covered, as will the processes underlying reproductive behaviors and internal regulation of basic drives (e.g., thirst).

This course fulfills the Biological Science (SB) component of the 2003 University Studies Program. SB courses include basic and applied study of fundamental principles of biology, including cell structure and function, genetics, ecology, evolution, and organismal biology. Each of these principles will be examined throughout the semester, as they apply to specific course content (e.g., structure and function of neurons and glial cells). This course will also include applications of biological principles to societal issues. In particular we will examine how physiological psychology influences and is influenced by issues such as biodiversity, biotechnology, and human wellness and disease, among others. In this course, you will be introduced to the scientific approach as it is used in various types of research pertaining to physiological psychology, and you will be expected to learn to critically evaluate the scope and limitations of this approach. Finally, all SB-designated courses provide each student with a term-long laboratory experience. The laboratory section is an integral part of PSYC 4080 (see below). Laboratory experiences throughout the semester will be well-integrated with material covered in lecture.

Tuesday/Thursday morning meetings will be primarily lecture format. Enrollment in the accompanying Thursday afternoon laboratory section is mandatory. Laboratory sections will consist of weekly quizzes, classroom activities, virtual and actual animal brain dissections, guest lectures, lab tours, and reviews of lecture material. There is a separate syllabus for the laboratory section.
STUDENT ATTENDANCE, CLASS DISCUSSION, AND PARTICIPATION

Classroom attendance is obviously important and expected. At lecture sessions, I will not take attendance, nor will you be penalized for missing class. You need not see me to justify absences from lecture. However, you should understand that your fellow students are one of your most important resources in this class. Particularly late in the semester, material will be routinely presented in class that is not covered in your textbook. Each day’s PowerPoint presentation will be handed out at the beginning of class to facilitate note-taking. Absent students may only receive these notes from me personally. If even one instance occurs of a student photocopying these presentations for an absent student, I will discontinue this courtesy. Note that laboratory section attendance IS required.

READINGS AND ASSIGNMENTS

Weekly readings assigned from the textbook must be completed prior to class. On exams you are responsible for all assigned reading as well as all material presented in class. All exams will be cumulative in terms of material presented throughout the semester. At least one class period will be devoted entirely to review before each exam, including the Final.

CLASS EVALUATION

In addition to the department-required end of the semester course evaluations, mid-term course evaluations will also be utilized. Within these evaluations, you are expected to respond honestly and provide constructive remarks. Constructive remarks go beyond stating that the class is “good” or “bad”, to providing explicit ideas on what could be done to make the class better, or what is beneficial and should continue to be utilized. Mid-term evaluations provide an opportunity for you to influence the class structure and how the course is taught, as well as a chance to help me become a better instructor.

EXAMS AND EVALUATION OF WRITTEN WORK

Each of the three exams will be primarily multiple-choice in format, with one short-answer essay question, and will consist of material covered in the textbook AND in lecture. If you are unable to attend class on an exam date, you must see me BEFORE THE EXAM to make arrangements to take the exam on an earlier date. Make-up exams will be allowed only in dire emergencies (documented illness or death of a family member ONLY).

GRADING PROCEDURE

Grading will be as follows: 90% and higher is an A, 80% - 89% is a B, 70% - 79% is a C, 60% - 69% is a D, and 59% and below is an F. However, the final point distribution across students will be used to adjust the % cutoff points for each grade level. Only downward adjustments will be made! For example, it may be the case that 88% will be an A. NO STUDENT’S GRADE WILL BE AFFECTED ADVERSELY BY THIS POLICY!! (If you make one of the cuts listed above, you WILL receive that grade or higher.)

COURSE REQUIREMENTS

<table>
<thead>
<tr>
<th>POINTS (TOTAL)</th>
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<tr>
<td>14 Lab Quizzes*</td>
</tr>
<tr>
<td>Lab Participation*</td>
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</tbody>
</table>
2 Midterm Exams 100 points each (200)
Final Exam 150 points (150)
Total 550 points

* = see Laboratory Syllabus

SPECIAL NEEDS

If you have a physical, learning, or psychological disability and require accommodations, please let me know as soon as possible. You will need to register with, and provide documentation of your disability to, University Disability Support Services (UDSS) in SEO, room 330 Knight Hall, 766-6189, TTY: 766-3073.

Likewise, student-athletes or others whose University-sanctioned extracurricular activities may affect their ability to attend lectures should provide appropriate documentation to me as soon as possible.

STATEMENT OF ACADEMIC HONESTY

All students are required to do independent original work. As outlined in University Regulation 802, Revision 2, plagiarism, cheating on exams or assignments, or other acts of dishonesty will be grounds for failure on a particular assignment, an F grade for the course, and/or expulsion from the University. There is a well-defined procedure to judge cases of academic dishonesty and serious penalties may be assessed. Students should be aware that software titled EVE2 might be used to detect plagiarism.

FINAL NOTE

The instructor reserves the right to change this syllabus at any time. You will be given fair warning should this occur.

For further information relevant to all course syllabi at UW, please see the website address below:

http://uwadmnweb.uwyo.edu/a&s/Current/2005Stud&TeachersWorking%20Together(7-29-05).doc