San José State University
College of Social Science, Department of Psychology
Psyc/Bio 129, Neuroscience, Section 1
Fall 2011

Instructor: Dr. Cheryl Chancellor-Freeland
Office Location: DMH 317
Telephone: (408) 924-5645
Email: Cheryl.Chancellor-Freeland@sjsu.edu
Office Hours: Thurs. 1:30 – 2:45 pm, or by appointment
Class Days/Time: Tu/Thurs 3:00 – 4:15 p.m.
Classroom: DMH 356
Prerequisites: Either PSYC 030 and 3 units of biology, or 9 units of biology

Faculty Web Page and MYSJSU Messaging
Copies of the course materials such as the syllabus, major assignment handouts, etc. may be found on my faculty web page at http://www.sjsu.edu/people/cheryl.chancellor-freeland/ or accessible through the Quick Links>Faculty Web Page links on the SJSU home page.

Course Description
Neuroscience is defined as the study of the nervous system. This field comprises several related disciplines including: neuroanatomy, neurochemistry, neuroendocrinology, neuropathology, pharmacology, physiology, and immunology. The united efforts of such disciplines have produced a better understanding of the ultimate function of the nervous system and behavior. This course will examine findings produced by these efforts. It will involve examining specific topics and research methods in detail.

Course Goals and Student Learning Objectives
Goals for this course fall into three broad categories. Learning outcomes for the first part of the course are a general understanding of the philosophical issues driving much of contemporary neuroscience research; an understanding of mechanisms used during brain development, and a firm hold on biological foundational knowledge as it relates to the central nervous system. The second part of the course will provide students with a detailed understanding of the sensory systems. Following the final section of the course, students should have an understanding of how neural systems contribute to various behaviors ranging from motivation to learning.
Required Texts/Readings


**Additional Reading and Resources:** Handouts will be provided to supplement reading. Check the site when directed to do so.

Writing Assistance: [http://psychology.about.com/science/psychology/msub_writing.htm](http://psychology.about.com/science/psychology/msub_writing.htm)
Website (Spartan Web Wizard): [http://www.sjsu.edu/faculty_and_staff/faculty_detail.jsp?id=2691](http://www.sjsu.edu/faculty_and_staff/faculty_detail.jsp?id=2691)
Research and plagiarism assistance: [http://tutorials.sjlibrary.org/tutorial/index.html](http://tutorials.sjlibrary.org/tutorial/index.html)

Library Liaison

The SJSU librarian specializes in social sciences and may serve as a resource for the development of research ideas and for finding the most appropriate research materials.

**Psychology Librarian:** Bernd Becker
408.808.2348
Bernd.Becker@sjsu.edu
[http://libguides.sjsu.edu/psychology](http://libguides.sjsu.edu/psychology)

Classroom Protocol

To succeed in this course, attendance is critical. You should come prepared for class discussions with a completion of course readings. Students are also expected to maintain a level of professional and courteous behavior at all times.

**Cell phones and other electronic devices**

You are to turn off cell phones and other electronic devices before the beginning of class. You may use a laptop to take notes during the lecture; however, if you are using your laptop for purposes other than taking notes for 129, you will be asked to leave your laptop at home for the remaining semester.

**Communication with instructor**

Use email, office hours, or class time. I will respond to emails M-F 9:00 – 5:00.

**Dropping and Adding**

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at [http://info.sjsu.edu/static/catalog/policies.html](http://info.sjsu.edu/static/catalog/policies.html). Add/drop deadlines can be found on the [current academic calendar](http://info.sjsu.edu/static/catalog/policies.html) page located at [http://www.sjsu.edu/academic_programs/calendars/academic_calendar/](http://www.sjsu.edu/academic_programs/calendars/academic_calendar/). The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/). Students should be aware of the current deadlines and penalties for dropping classes.
Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.

Assignments and Grading Policy
The requirements for this class include 4 quizzes, 4 examinations (3 midterms and a final exam), and 1 research paper. Each quiz is worth 5% of your grade. The midterms and the paper each count 15% toward your final grade. The research report topic and the final exam will be worth a total of 20%.

Quiz format is objective (i.e., multiple choice, true/false, fill-in, identify, and match), and short answer. Examination format is objective and essay. You are responsible for bringing a No. 2 pencil and 882-ES answer form to each exam. The final exam is scheduled for Friday 12/16 @ 2:45.

Papers will be due on the last scheduled class meeting. They must be at least 7 pages of text (excluding summary, references and cover page) and should be typed (double spaced). This assignment is designed to provide you with an opportunity to explore a particular topic of interest and to demonstrate what you’ve learned about neuroscience. You may research a particular topic, theory, or article. These are merely intended as examples of what is possible, and all topics must be preapproved by the professor. More will be said about this assignment in class.

The Department of Psychology has adopted the policy that designated written assignments will be returned ungraded for substantial errors in grammar, punctuation, spelling, clarity, conciseness, and validity of content. Papers returned will suffer a minimum penalty of 10% on the final grade on rewritten work. The revised paper must be returned within a maximum of seven calendar days and submitted with a copy of the original work.

Make-up Exams
Due to the size of the class, there will be no early, late or make-up exams or work (with the exception of a written medical excuse). Please check your schedule to ensure that you have no conflicts with the due dates. Examination scores will not be posted next to my office. You may also review exams during office hours and by appointment.

Late Assignments
Again, no extensions for assignments will be given except in cases of documented emergencies or serious illness.

Extra Credit
A maximum of 8 extra credit points may be earned by attending research presentations, either professional conferences or departmental (Psychology or Biology Departmental sponsored). To receive credit, you must write a brief summary (1 page) of the each presentation (Due 12/8). All summaries are to be typed (double-spaced) with a title page referencing presentation. Point value per activity will be determined by the professor. There may also be extra credit opportunities in class.
University Policies

Academic integrity

Academic integrity is essential to the mission of San José State University. As such, students are expected to perform their own work (except when collaboration is expressly permitted by the course instructor) without the use of any outside resources. Students are not permitted to use old tests, quizzes when preparing for exams, nor may they consult with students who have already taken the exam. When practiced, academic integrity ensures that all students are fairly graded. Violations to the Academic Integrity Policy undermine the educational process and will not be tolerated. It also demonstrates a lack of respect for oneself, fellow students and the course instructor and can ruin the university's reputation and the value of the degrees it offers. The Student Conduct and Ethical Development website is available at http://www.sa.sjsu.edu/judicial_affairs/index.html.

Violators of the Academic Integrity Policy will be subject to failing this course and being reported to the Office of Judicial Affairs for disciplinary action which could result in suspension or expulsion from San José State University.

The following URL will take you to the SJSU library's plagiarism tutorial. If you have not yet completed this, it is worth your while to do so: http://tutorials.sjlibrary.org/plagiarism/index.htm

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the Disability Resource Center (DRC) at http://www.drc.sjsu.edu/ to establish a record of their disability.

Student Technology Resources

Computer labs for student use are available in the Academic Success Center located on the 1st floor of Clark Hall and on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library.

A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include digital and VHS camcorders, VHS and Beta video players, 16 mm, slide, overhead, DVD, CD, and audiotape players, sound systems, wireless microphones, projection screens and monitors.

Learning Assistance Resource Center

The Learning Assistance Resource Center (LARC) is located in Room 600 in the Student Services Center. It is designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. The center provides support services, such as skills assessment, individual or group tutorials,
subject advising, learning assistance, summer academic preparation and basic skills
development. The LARC website is located at http://www.sjsu.edu/larc/.

SJSU Writing Center

The SJSU Writing Center is located in Room 126 in Clark Hall. It is staffed by
professional instructors and upper-division or graduate-level writing specialists from
each of the seven SJSU colleges. Our writing specialists have met a rigorous GPA
requirement, and they are well trained to assist all students at all levels within all
disciplines to become better writers. The Writing Center website is located at
http://www.sjsu.edu/writingcenter/about/staff/.

Below is to provide a quick summary of important course events. I have also included a
brief description of somewhat broad learning outcomes for each section. You may find
this, along with the study guides, useful when preparing for quizzes and exams. A
detailed schedule of events is also provided, but this may be subject to modification as
instructor deems necessary. You are responsible for recording any changes that may
occur throughout the semester.

Summary of Events

Quiz 1
Date: Thursday September 8\textsuperscript{th} (Due September 15\textsuperscript{th})
Lectures: August 25 – September 8
Outcomes: Describe mind/body issue, and the split-brain phenomenon.
Describe and compare neurons, glia and intraneuronal
communication

Midterm I
Date: Thursday, September 29\textsuperscript{th}
Lectures: August 25 – September 27
Chapters: Chapters 1-6 & handouts
Describe interneuronal communication
Demonstrate a complete understanding neuron function, including
pre- and post-synaptic mechanisms.
Describe the biosynthetic pathway for neurotransmitters.
Describe specific drug and neurotransmitter–receptor interactions,
and some brain systems involved.

Quiz 2
Date: Thursday October 13\textsuperscript{th} (Due Tuesday 18\textsuperscript{th})
Lectures: October 4 – October 13
Outcomes: Describe ontogenetic nervous system development.
Demonstrate an understanding of basic neuroanatomy, and
specific cases of brain damage to illustrate brain function.

Midterm II
Date: Thursday, October 27\textsuperscript{th}
Lectures: October 4 – October 25
Chapters: Chapters 7, 9, 10, 23 (tentative: pp. 689-709)
Outcomes: Describe the development of the nervous system and key
neuroanatomical structures.
Discuss primary and secondary visual systems.
Describe common features among sensory systems.
Quiz 3
Date: Tuesday November 8th (Due November 10th)
Lectures: Nov. 1 – Nov. 10
Outcomes: Chemical and somatic sensory systems.

Midterm III
Date: Tuesday, November 29th
Lectures: Nov. 1 – Nov. 22
Chapters: Chapters 9, 10, 12, 15 (pp. 481-501)
Outcomes: An understanding of key concepts regarding motivational systems.

Quiz 4
Date: Tuesday December 6th (Due December 8th)
Lectures: December 1 – December 6
Outcomes: An understanding of memory and learning, with a particular focus on LTP.

Final Exam
Date: Friday 12/16, 2:45 – 5:00
Lectures: All
Chapters: All reading with particular focus on material following Midterm III

Please note: Quizzes will be take-home tests. This means you are on your honor when taking these quizzes. Your time is unlimited; however, you may not discuss the questions or responses with other individuals. Collaborative work will result in a zero for all.

Outcomes and Associated Points

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Approximate percent</th>
<th>Points</th>
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<tbody>
<tr>
<td>Quizzes (4)</td>
<td>5% each</td>
<td>15 each (60 total)</td>
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<tr>
<td>Midterms (3)</td>
<td>15% each</td>
<td>45 each (135 total)</td>
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<tr>
<td>Paper (1)</td>
<td>15%</td>
<td>45</td>
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<tr>
<td>Paper Topic</td>
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<td>15</td>
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<tr>
<td>Final Exam</td>
<td>15%</td>
<td>45</td>
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<tr>
<td>TOTAL</td>
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Grading Distribution

Grading Scale (300 points)

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<tr>
<th>Total Points</th>
<th>Percentage</th>
<th>Grade</th>
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<tr>
<td>269 – 300</td>
<td>90 – 100</td>
<td>A</td>
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<tr>
<td>239 – 268</td>
<td>80 – 89</td>
<td>B</td>
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<tr>
<td>Date</td>
<td>Reading (chapter)</td>
<td>Lecture</td>
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<tr>
<td>8/25</td>
<td>1, Handout (Split Brain)</td>
<td>Intro/Expectations</td>
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<td>8/30</td>
<td>1, 2, 3 (pp. 52-61); handout (Beyond the Neuron…)</td>
<td>Neurons and glia: function and structure</td>
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<td>9/1</td>
<td>3</td>
<td>Electrophysiology</td>
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<tr>
<td>9/6</td>
<td>3, 4</td>
<td>Electrophysiology</td>
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<tr>
<td>9/8</td>
<td>4</td>
<td>Electrophysiology</td>
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<tr>
<td>9/13</td>
<td>CONFERENCE</td>
<td>NO CLASS-</td>
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<tr>
<td>9/15</td>
<td>5</td>
<td>Synaptic Transmission/Receptor Characterization</td>
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<tr>
<td>9/20</td>
<td>5, 6</td>
<td>Synaptic transmission/Receptor Characterization</td>
</tr>
<tr>
<td>9/22</td>
<td>6</td>
<td>Neuropharmacology</td>
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<tr>
<td>9/27</td>
<td>15 (pp. 499, 502-505)</td>
<td>Drugs and behavior</td>
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<td>9/29</td>
<td>Midterm I</td>
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<td>7 (Chapter 23, TBD); Handout</td>
<td>Neuroanatomy, CNS Development</td>
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<td>7 (Chapter 23, TBD)</td>
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<td>7 (Chapter 23, TBD) 9</td>
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<td>9, 10</td>
<td>Sensory Systems: Vision</td>
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<td>10/18</td>
<td>9, 10</td>
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<td>10/20</td>
<td>10</td>
<td>Sensory Processing</td>
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<tr>
<td>Date</td>
<td>Homework / Readings</td>
<td>Midterm</td>
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<tr>
<td>10/25</td>
<td>Catch-up Review</td>
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<tr>
<td>10/27</td>
<td>7, 9, 10 (Select pages in 23 TBA)</td>
<td>Midterm II</td>
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<tr>
<td>11/1</td>
<td>8, handout</td>
<td>Chemical Senses</td>
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<tr>
<td>11/3</td>
<td>8,12</td>
<td>Chemical and Somatic Senses; Focus on pain</td>
</tr>
<tr>
<td>11/8</td>
<td>15 (pp. 481-501)</td>
<td>Hypothalamus/Limbic System</td>
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<tr>
<td>11/10</td>
<td>22 (pp. 667-669)</td>
<td>Stress</td>
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<td>11/15</td>
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<td>NO CLASS</td>
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<td>11/17</td>
<td>16, handout</td>
<td>Motivational Systems (TBD)</td>
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<tr>
<td>11/22</td>
<td>18</td>
<td>Emotion</td>
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<tr>
<td>11/24</td>
<td>THANKSGIVING</td>
<td>NO CLASS</td>
</tr>
<tr>
<td>11/29</td>
<td>8, 12, 15, 16 select pp. chapter 22</td>
<td>Midterm III</td>
</tr>
<tr>
<td>12/1</td>
<td>18</td>
<td>Emotion</td>
</tr>
<tr>
<td>Tue. 12/6</td>
<td>24</td>
<td>Learning and Memory</td>
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<tr>
<td>12/8</td>
<td>22</td>
<td>Mental illness</td>
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<tr>
<td>Friday 12/16</td>
<td>Final Exam: 2:45 – 5:00</td>
<td>All Reading/Lecture</td>
</tr>
</tbody>
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Additional Information For the 129 Final Report (Due December 8th)

The structure for your report is somewhat flexible, but it must include a summary, introduction, methods, results discussion and a list of references (all in APA, of course!). As discussed in class, you may construct your final report as a 100w paper, so that there are essentially a series of chronologically-ordered article summaries. If this is your approach, you must state the rationale, background information and theoretical propositions in an introductory section. To complete your paper with the page limitations, you will also have to summarize some of the studies more than would be expected in a 100w paper. You must describe what was done in the studies that you have sited, but some detailed information (e.g., numbers of participants) should be omitted. You must also have a conclusion/discussion section which is your critical analysis of the work that you reviewed. This is where you tie everything together, and you discuss the imitations and the strengths of the research on your topic.

If you choose to organize your paper as a traditional research paper, it would read like a review article, which I’m sure you have come across in your research. You might organize your paper in this way and I’ve provided some additional example formats
below. In all cases, the methods and results would be discussed, but they would greatly summarized.

Finally, for all papers, instead of an “Abstract”, you should open your paper with a summary of your research. It should include a rationale, thesis, methods (e.g., humans, animals, tests?) general results, and final conclusion. Your paper is to be based on empirical research (7 references), and is to be at least 7 pages in length (please, no more than 10 pages). Your research report will be graded on content and clarity (first and foremost) and format. Remember APA!

Below you will find two sample outlines for a “traditional research paper”.

Version 1

I. INTRODUCTION - (Providing rationale and background, leading to the thesis, stress-induced cortisol damages the hippocampus) –
II. BODY – Research describing stress, cortisol and hippocampal atrophy
   A. Earlier Work by Sapolsky (rodent model)
      1. Stress and cognition
         a. stress and hippocampal-associated cognition
      2. Stress and Neuron Dysfunction
         a. Neuron death
         b. Neuron atrophy
   B. Recent Work by McEwen (human model)
      1. Stress-Brain Regions
         a. fMRI and PTSD
         b. fMRI and normal population, stress induction
      2. Postmortem Examination
         a. cellular examination
   C. Cognitive testing
      1. Virtual Morris Water Maze
      2. Morris Water Maze

III. CONCLUSION
   A. Analytical summary
      1. Rodent model
      2. Human work
      3. Most recent findings
   B. Thesis reworded
   C. Concluding statement

Version 2

I. INTRODUCTION - Providing rationale and background, leading to the thesis Stress-Induced Cortisol Damages the Hippocampus. General review of the early work by Sapolsky and later work by McEwen.
II. METHODS – Description of stress/stressor, assessment of hippocampal function.
   A. Types of stress/stressor
      1. Rodent model
         a. cold water (e.g., reviewed articles described subjecting 30-130 rats and mice to 10 degree water for 5 – 10 minutes twice daily.)
b. electric shock

2. Humans
   a. PTSD
   b. Experimentally induced stress

C. Assessment of Hippocampal function
   1. FMRI-Brain Regions
      2. Postmortem Examination
      3. Cognitive testing
   a. virtual Morris Water
   b. rodent Morris Water Maze

III. RESULTS – General outcomes
   A. Experimentally induced stress
      1. humans
      2. rodents
   B. PTSD (as somewhat different because of nature and duration.)
   C. Hippocampal assessment
      1. fMRI
      2. postmortem
      3. cognitive tests

III. CONCLUSION
   A. Analytical and critical summary
      1. Rodent model
      2. Human work
      3. Most recent work
   B. Thesis reworded
   C. Concluding statement