San José State University
Department of Psychology
PSYC/BIO 129, Neuroscience, Sec. 01
Fall 2012

Instructor: Cheryl Chancellor-Freeland, Ph.D.
Office Location: DMH 317
Telephone: (408) 924-5645
Email: Cheryl.Chancellor-Freeland@sjsu.edu
Office Hours: Tuesday, 10:15 – 11:30 AM (and by appointment)
Class Days/Time: Tue./Thurs. 9:00 – 10:15 AM
Classroom: DMH 167
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
Learning Outcomes
More specific course outcomes have been outlined in the Summary of Events following each quiz and exam (see below). Course and program learning objectives are as follows.
Course Learning Outcomes (CLOs)
Upon successful completion of this course, Psych/Bio 129 students will be able to:

CLO1 – Students will be able to – identify, describe, and communicate the major concepts related to basic neuroanatomy, neurophysiology and psychopharmacology. Assessment for this will be in quiz 1, midterm I, and in parts of quiz 2 and midterm II.

CLO2 – Students will be able to – describe, and communicate the major transduction mechanisms, neuroanatomical pathways and theoretical perspectives associated with vision and nonvisual sensory systems, motivational systems and learning processes. Assessment for this CLO will be conducted in quizzes 2 and 3, and midterms I and II.

CLO3 – Students will be able to – identify, describe, and communicate experimental approaches and associated empirical findings for various methodological approaches in neuroscience. Assessment for this CLO will be conducted primarily in Midterm I, but also in quizzes 1 - 3, and midterms II and III.

CLO4 – Students will be able to – think critically and creatively about neuroscience approaches to address issues related to behavioral and mental health processes. This CLO will be assessed in essay-type questions on primarily on the final exam.

CLO5 – Students will be able to – apply neuroscience principles to individual, interpersonal and group behavioral and mental health issues. This will be assessed on the final exam.

Program Learning Outcomes (PLO)
Upon successful completion of the psychology major requirements…

PLO1 – Knowledge Base of Psychology – Students will be able to identify, describe, and communicate the major concepts, theoretical perspectives, empirical findings, and historical trends in psychology.

PLO2 – Research Methods in Psychology – Students will be able to design, implement, and communicate basic research methods in psychology, including research design, data analysis, and interpretations.

PLO3 – Critical Thinking Skills in Psychology – Students will be able to use critical and creative thinking, skeptical inquiry, and a scientific approach to address issues related to behavior and mental processes.

PLO4 – Application of Psychology – Students will be able to apply psychological principles to individual, interpersonal, group, and societal issues.

PLO5 – Values in Psychology – Students will value empirical evidence, tolerate ambiguity, act ethically, and recognize their role and responsibility as a member of society.
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

Website (Spartan Web Wizard):
http://www.sjsu.edu/faculty_and_staff/faculty_detail.jsp?id=2691

Research and plagiarism assistance: 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

**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. Add/drop deadlines can be found on the [current academic calendar](http://www.sjsu.edu/academic_programs/calendars/academic_calendar/) web page located at http://www.sjsu.edu/academic_programs/calendars/academic_calendar/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/late_drops/policy/) is available at http://www.sjsu.edu/aars/policies/late_drops/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](http://www.sjsu.edu/advising/).

**Assignments and Grading Policy**

The requirements for this class include 3 quizzes, 4 examinations (3 midterms and a final exam), and 1 research paper. Each quiz is worth approximately 7% 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 Tuesday 12/18 @ 7:15 AM. (sorry!)

Literature review research papers will be due on the last scheduled class meeting (12/6). 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. The paper topic assignment (due 9/27) is a one-page (maximum) description of your literature review research paper. This is to be double spaced with at least one reference (APA format). More will be said about these assignments 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. We will review exams in class, and 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 12/6). 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](http://www.sjsu.edu/larc/) 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](http://www.sjsu.edu/writingcenter/about/staff/) 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 6th (Due September 11th)

**Lectures:** August 23 – September 6

**Outcomes:**
- Demonstrate a clear understanding of structure and function of the CNS.
- Describe and compare neurons, glia and intraneuronal communication and the electrophysiology.

**Midterm I**

**Date:** Thursday, September 27th

**Lectures:** August 23 – September 25

**Chapters:** Chapters 1-7; handout

**Outcomes:**
- 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 11th (Due Tuesday 16th)
Lectures: October 2 – October 11
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 25th
Lectures: October 2 – October 25
Chapters: Chapters 11, 12, 22, pp 717-744.
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: Thursday November 8th (Due November 13th)
Lectures: Oct. 30 – Nov. 6
Outcomes: Demonstrate a basic understanding of mechanical and chemical senses. What causes pain?

**Midterm III**
Date: Tuesday, November 27th
Lectures: Oct. 30 – Nov. 27
Chapters: Chapters 9, 11, 12
Outcomes: An understanding of underlying sensory mechanisms driving specific motivations. Emphasis will be on stress and emotions.

**Final Exam**
Date: Tuesday December 18th, 7:15 – 9:30 AM (again, sorry!)
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 (3)</td>
<td>7% each</td>
<td>20 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>
<td>5%</td>
<td>15</td>
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<tr>
<td>Final Exam</td>
<td>15%</td>
<td>45</td>
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<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
<td><strong>300</strong></td>
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## Grading Distribution

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<thead>
<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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<td>194 – 238</td>
<td>65 – 75</td>
<td>C</td>
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<tr>
<td>150 – 193</td>
<td>50 – 64</td>
<td>D</td>
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<tr>
<td>149</td>
<td>less than 50</td>
<td>F</td>
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## Tentative Scheduled Events:

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Reading (chapter)</th>
<th>Lecture</th>
<th>Activities</th>
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<tbody>
<tr>
<td>1</td>
<td>8/23</td>
<td>1, Handout (Beyond the Neuron Doctrine)</td>
<td>Intro/Expectations</td>
<td>Begin research for paper topics</td>
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<tr>
<td>2</td>
<td>8/28</td>
<td>2</td>
<td>Neurons and glia: function and structure</td>
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<td></td>
<td>8/30</td>
<td>3</td>
<td>Electrophysiology</td>
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<td>3</td>
<td>9/4</td>
<td>3, 4</td>
<td>Electrophysiology</td>
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<td>4</td>
<td>9/6</td>
<td>4</td>
<td>Electrophysiology</td>
<td>Quiz 1 (Chapters 1-4)</td>
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<tr>
<td>4</td>
<td>9/11</td>
<td>5</td>
<td>Synaptic Transmission/Receptor Characterization</td>
<td>Quiz 1 due</td>
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<tr>
<td></td>
<td>9/13</td>
<td>5</td>
<td>Synaptic transmission/Receptor Characterization</td>
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<tr>
<td>5</td>
<td>9/18</td>
<td>7</td>
<td>Synaptic</td>
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<td>Date</td>
<td>Events</td>
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<tr>
<td>9/20</td>
<td>6</td>
<td>Neuropharmacology</td>
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<tr>
<td>9/25</td>
<td>6</td>
<td>Drugs and behavior</td>
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<tr>
<td>9/27</td>
<td>6</td>
<td>Midterm I From the beginning of the semester Chapters 1-7 and handout; Paper topics due</td>
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<td>10/2</td>
<td>7</td>
<td>Chapter 22, Select pp from chapters 23-4 Neuroanatomy, CNS Development</td>
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<td>10/4</td>
<td>7</td>
<td>Appendix (Handout?) Neuroanatomy, Guest Lecture</td>
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<td>10/9</td>
<td>8</td>
<td>Appendix Neuroanatomy,</td>
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<td>10/11</td>
<td>8</td>
<td>Catch-up Neuroanatomy, CNS Development</td>
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<td>10/16</td>
<td>9</td>
<td>11 Sensory Systems: Vision Quiz 2 due</td>
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<tr>
<td>10/18</td>
<td>9</td>
<td>11-12 Sensory Processing</td>
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<td>10/23</td>
<td>10</td>
<td>Catch-up Review</td>
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<td>10/25</td>
<td>10</td>
<td>Midterm II From midterm I Chapters 11, 12, 22, pp 717-744, select pp from chapters 23-4 handout (TBA)</td>
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<td>10/30</td>
<td>11</td>
<td>9  Somatic Senses</td>
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<td>11/1</td>
<td>11</td>
<td>10 Somatic Senses; Focus on pain</td>
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<td>11/6</td>
<td>12</td>
<td>15 Chemical Senses</td>
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<td>11/8</td>
<td>12</td>
<td>CONFERENCE NO CLASS Quiz 3</td>
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<td>11/13</td>
<td>13</td>
<td>28 (TBD) Sleep (TBD) Quiz 3 due</td>
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<td>11/15</td>
<td>13</td>
<td>29 Emotion</td>
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<td>11/20</td>
<td>14</td>
<td>Handout Stress Review Session Time TBD</td>
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<td>11/22</td>
<td>14</td>
<td>THANKSGIVING NO CLASS</td>
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<tr>
<td>11/27</td>
<td>15</td>
<td>28 (TBD) Midterm III</td>
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<td>11/29</td>
<td>15</td>
<td>31 Stress and Memory</td>
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<td>12/4</td>
<td>16</td>
<td>24 Learning and Memory</td>
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<tr>
<td>12/6</td>
<td>16</td>
<td>22 Mental illness</td>
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<td>Tues day 12/18</td>
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<td>Final Exam: 2:45 – 5:00 All Reading/Lecture</td>
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Additional Information For the 129 Final Report (Due December 6th)
The structure for your report is somewhat flexible, but it must include a summary, introduction, and a description of the methods, results and discussion. You also need 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.

To reiterate, 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
         b. stress and hippocampal volume loss
      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
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