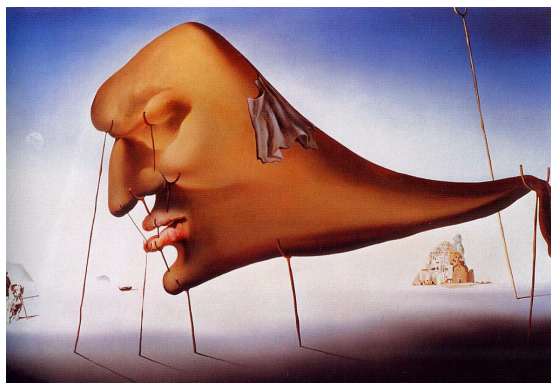


# Psych 133: The Psychology of Sleep



## Syllabus [Fall 2015]: A brain-mind odyssey

**Lectures:** MON & WED 3-4PM, 245 Li Ka Shing

**Professor:** Matthew Walker [mpw@berkeley.edu](mailto:mpw@berkeley.edu)  
(Office hours: By email appointment)

### GSI:

Joseph Winer	<a href="mailto:jwiner@berkeley.edu">jwiner@berkeley.edu</a>
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(GSI office hours: To be announced in section)

**Discussion sections:** begin in 2<sup>nd</sup> week with your respective GSI

**Course Overview:** You will spend one-third of your life sleeping...and scientists still have no idea why! We will not discover all the answers in this class. However, we will take a fascinating journey into the secrets of the sleeping brain and dreaming mind. We will review some of the leading theories for why we sleep, observe what happens when organisms (including ourselves) do not sleep enough, and what the cognitive and clinical consequences of a lack of sleep can be. This course has three primary goals: (1) to provide a basic introduction to the study of sleep and an overview of sleep measurement, regulation, ontogeny, phylogeny, and brain physiology, (2) discuss the role of sleep (and a lack thereof) in numerous brain functions, and (3) outline the abnormalities of sleep that occur in, and even contribute to, clinical disorders. We will seek scientifically informed answers to questions such as: Should I sleep before an exam? Why do I dream? How much do animals sleep? Can you sleep with half a brain? What happens when I do (and don't) sleep? Can I interpret my dreams and those of others? What is insomnia? Does sleep disruption contribute to the cause or maintenance of other psychiatric disorders? Can a lack of sleep kill you? What is the capital of Wales?

## Overview of Lecture Plan

— All readings are optional, and are there to help advance your knowledge and understanding of the lectures and sections. It is wise to read this material before class. It will allow for a better understanding of the lecture and also give you the opportunity to ask me any questions in class that may have come up in your reading.

KEY	Sleep Basics	Sleep & Cognition	Dreams & Clinical	Revision	Exam
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AUGUST	
Monday 31 <sup>st</sup>	<b>Lecture 1: Introduction &amp; let's talk sleep</b> Overview of course, timeline and a mass Freudian couch session — <a href="http://www.sleepsources.org/uploads/sleepsyllabus/m.html">http://www.sleepsources.org/uploads/sleepsyllabus/m.html</a>
SEPTEMBER	
Wednesday 2 <sup>nd</sup>	<b>Lecture 2: Sleep basics: What is it, how do we measure it and what types are there?</b> Reading: — <a href="http://www.ninds.nih.gov/disorders/brain_basics/understanding_sleep.htm">http://www.ninds.nih.gov/disorders/brain_basics/understanding_sleep.htm</a> — <a href="http://www.sleepsources.org/uploads/sleepsyllabus/a.html">http://www.sleepsources.org/uploads/sleepsyllabus/a.html</a>
Monday 7 <sup>th</sup>	<b>Labor Day – No Lecture</b>
Wednesday 9 <sup>th</sup>	<b>Lecture 3: Sleep basics: Who does it [us and them] and how much?</b> Reading: — <a href="http://www.sleepsources.org/uploads/sleepsyllabus/b.html">http://www.sleepsources.org/uploads/sleepsyllabus/b.html</a> — Siegel J. Why we sleep. <i>Scientific American</i> Nov: 92-97 (2003)
Monday 14 <sup>th</sup>	<b>Lecture 4: Sleep basics: Brain mechanisms of sleep [Sleep Onset, NREM, REM]</b> Reading: — <a href="http://www.scholarpedia.org/article/Neurobiology_of_sleep_and_wakefulness">http://www.scholarpedia.org/article/Neurobiology_of_sleep_and_wakefulness</a>
Wednesday 16 <sup>th</sup>	<b>Lecture 5: Sleep basics: Circadian rhythms</b> Reading: — <a href="http://www.sleepsources.org/uploads/sleepsyllabus/g.html">http://www.sleepsources.org/uploads/sleepsyllabus/g.html</a> — <a href="http://en.wikipedia.org/wiki/Circadian">http://en.wikipedia.org/wiki/Circadian</a>
Monday 21 <sup>st</sup> 21 <sup>st</sup>	<b>Lecture 6: Sleep basics: 1. How does sleep change across the lifespan? 2. Why do we sleep? Overview of theories</b> Reading: — <a href="http://www.sleepsources.org/uploads/sleepsyllabus/c.html">http://www.sleepsources.org/uploads/sleepsyllabus/c.html</a> — <a href="http://www.sleepsources.org/uploads/sleepsyllabus/i.html">http://www.sleepsources.org/uploads/sleepsyllabus/i.html</a>
Wednesday 23 <sup>th</sup>	<b>Revision Lecture: Midterm 1</b>
Monday 28 <sup>th</sup>	<b>“MIDTERM” 1</b>
Wednesday 30 <sup>st</sup>	<b>Lecture 7: Sleep &amp; Cognition I: Creativity and Insight</b> Reading: — Mazzarello P. What dreams may come? <i>Nature</i> (2000); <b>408</b> (6812):523 — Wagner <i>et al.</i> Sleep inspires insight. <i>Nature</i> <b>427</b> : 352-5 (2004)
OCTOBER	
Monday 5 <sup>th</sup>	<b>Lecture 8: Sleep &amp; Cognition II: Procedural Memory (Skills)</b> Reading:

	—Mednick <i>et al.</i> The restorative effect of naps on perceptual deterioration. <i>Nat Neurosci.</i>
Wednesday 7 <sup>th</sup>	<b>Lecture 9: Sleep &amp; Cognition III: Declarative Memory (Facts)</b> Reading: —Walker MP. The role of sleep in cognition and emotion. <i>Ann N Y Acad Sci</i> 2009;1156:168-97. (ONLY PAGES 168-181) —Marshall L, & Born J. The contribution of sleep to hippocampus-dependent memory consolidation. <i>Trends Cogn Sci</i> (2007);11(10):442-50.
Monday 12 <sup>th</sup>	<b>Lecture 10: Sleep &amp; Cognition IV: Memory (Association)</b> Reading: —Walker MP. The role of sleep in cognition and emotion. <i>Ann N Y Acad Sci</i> 2009;1156:168-97. (ONLY PAGES 181-185) —Cai DJ et al. REM, not incubation, improves creativity by priming associative networks. <i>Proc Natl Acad Sci U S A</i> 2009;106(25):10130-4.
Wednesday 14 <sup>th</sup>	<b>Lecture 11: Sleep Deprivation I: Immune Function and Metabolism</b> Reading: —Bryant <i>et al.</i> , Sick and tired: Does sleep have a vital role in the immune system? <i>Nat Rev Immunol.</i> (2004) 4(6):457-67. —Trenell <i>et al.</i> , Sleep and metabolic control: waking to a problem? <i>Clin Exp Pharmacol Physiol.</i> (2007) 34(1-2):1-9.
Monday 19 <sup>th</sup>	<b>Lecture 12: Sleep Deprivation II: Body &amp; brain consequences – Records and first studies</b> Reading: — <a href="http://en.wikipedia.org/wiki/Sleep_deprivation">http://en.wikipedia.org/wiki/Sleep_deprivation</a> —Everson <i>et al.</i> , Sleep deprivation in the rat: III. Total sleep deprivation. <i>Sleep</i> 12: 13-21 (1989)
Wednesday 21 <sup>st</sup>	<b>Lecture 13: Sleep Deprivation III: Brain consequences - Attention, Professional and Educational impact</b> Reading: — <a href="http://en.wikipedia.org/wiki/Sleep_deprivation">http://en.wikipedia.org/wiki/Sleep_deprivation</a> (again) — <a href="http://nymag.com/news/features/38951/">http://nymag.com/news/features/38951/</a>
Monday 26 <sup>th</sup>	<b>Lecture 14: Sleep Deprivation IV: Brain consequences – Memory formation, emotional (in)stability and shots of vodka</b> Reading: —Walker MP. The role of sleep in cognition and emotion. <i>Ann N Y Acad Sci</i> 2009;1156:168-97. (ONLY PAGES 185-192) —Yoo <i>et al.</i> The human emotional brain without sleep - a prefrontal amygdala disconnect. <i>Curr Biol</i> 2007;17(20):R877-8.
Wednesday 28 <sup>th</sup>	<b>Revision Lecture: Midterm 2</b>
NOVEMBER	
Monday 2 <sup>nd</sup>	<b>“MIDTERM” 2</b>
Wednesday 4 <sup>th</sup>	<b>Lecture 15: Dreaming I: Interpretation, Freud &amp; Lucidity</b> Reading: — <a href="http://en.wikipedia.org/wiki/Dream_interpretation">http://en.wikipedia.org/wiki/Dream_interpretation</a> — <a href="http://en.wikipedia.org/wiki/Contemporary_dream_interpretation">http://en.wikipedia.org/wiki/Contemporary_dream_interpretation</a> — <a href="http://en.wikipedia.org/wiki/Lucid_dream">http://en.wikipedia.org/wiki/Lucid_dream</a>
Monday 9 <sup>th</sup>	<b>Lecture 16: Dreaming II: The 21st Century version</b> Reading: — <a href="http://www.sleepsources.org/uploads/sleepsyllabus/h.html">http://www.sleepsources.org/uploads/sleepsyllabus/h.html</a> —Crick & Mitchison. The function of dream sleep. <i>Nature</i> 304(5922):111-4. (1983)

Wednesday 11 <sup>th</sup>	<b>Lecture 17: Dreaming III: Experimentally probing the dreaming brain</b> Reading: —Stickgold <i>et al.</i> Sleep, learning, and dreams: off-line memory reprocessing. <i>Science</i> (2001); <b>294</b> (5544):1052-7. (ONLY PAGES 1055-1056, although you can read the whole article if you like)
Monday 16 <sup>th</sup>	<b>Lecture 18: Sleep in the Clinic I: Insomnia</b> Reading: — <a href="http://www.scholarpedia.org/article/Insomnia">http://www.scholarpedia.org/article/Insomnia</a> —Roth., Prevalence, Associated Risks, and Treatment Patterns of Insomnia. <i>J Clin Psychiatry</i> <b>66</b> (suppl 9) (2005)
Wednesday 18 <sup>th</sup>	<b>Lecture 19: Sleep in the Clinic II: Narcolepsy</b> Reading: — <a href="http://www.scholarpedia.org/article/Narcolepsy">http://www.scholarpedia.org/article/Narcolepsy</a> — <a href="http://www.sleepfoundation.org/article/sleep-related-problems/narcolepsy-and-sleep">http://www.sleepfoundation.org/article/sleep-related-problems/narcolepsy-and-sleep</a>
Friday 20 <sup>th</sup>	<b>Sleep Outreach Project Submission: Open</b>
Monday 23 <sup>rd</sup>	<b>No Lecture: Thanksgiving</b>
Wednesday 25 <sup>th</sup>	<b>No Lecture: Thanksgiving</b>
Friday 27 <sup>th</sup>	<b>Sleep Outreach Project Submission: Close (5PM)</b>
Monday 30 <sup>th</sup>	<b>Lecture 20: Sleep in the Clinic III: Things that go bump in the night—Parasomnias, REM behavioral disorder, Fatal Familial Insomni</b> Reading: —Mahowald & Schenck. Insights from studying human sleep disorders. <i>Nature</i> (2005); <b>437</b> (7063):1279-85.
DECEMBER	
Wednesday 2 <sup>nd</sup>	<b>Revision Lecture: Midterm 3</b>
Tuesday 15 <sup>th</sup> (7-8PM)	<b>“MIDTERM” 3</b>

**Grading:** Your course grade is made up of three different sources. 1) Exams: Three, *non-cumulative* “midterm” exams will be administered, and the average of *all three test scores* will be taken as the exam score, with this average comprising 70% of the final grade, 2) Sleep Outreach Project: which will comprise 20% of the final grade, and 3) Discussion section attendance/participation: which will comprise 10% of the final grade. NOTE: *There will be no make-up exams for any reason.*

**Exams:** There will be three exams, consisting of multiple-choice questions that will be drawn from the lectures and set readings. The exams will *not* be cumulative. In the exams, you should be able to demonstrate that you have understood the factual points and arguments covered. You are required to take all three exams. All exams will be closed book. There will be no grade changes except for clerical errors.

**Sleep Outreach Project:** Your goal is to help educate others about the benefits of sleep, the consequence of sleep loss and of sleep disorders by creating a newspaper article, video/YouTube, brochure or an exciting idea of your own. More details to come in class and discussion sections.

**Due date:** Submission opens November 20<sup>th</sup> (Fri). The final due date, when all sleep outreach projects must be submitted without exception, is **5PM November 27<sup>th</sup> (Fri), without fail.**

**Reader:** All reading associated with each lecture (but not the lecture slides themselves), will be posted on the class bCourses website for download as a PDF document if they are journal articles or listed above if they are web links.

**Discussion sections:** To begin in 2<sup>nd</sup> week. *Discussion sections are required.* You have been assigned to a time. Make sure you attend the discussion section to which you signed up for.

**Lecture slides:** A PDF of all lecture slides will be posted on bCourses website at least 12 hours before each class and will remain there after.

**Accommodations:** If you have disability-related accommodations in this class please email or speak with your GSI. The Disabled Students' Program (DSP) is the campus office responsible for verifying that students have disability-related needs for academic accommodations and for planning appropriate accommodations, in cooperation with the students themselves and their instructors. Students who need academic accommodations should request them from DSP: <http://dsp.berkeley.edu/>