The nature of what we call consciousness and the nature of what we call reality are central questions in both science and Buddhism. While the encounter between Buddhism and Western science can be traced back to the 19th-century, it garnered momentum and renown when, thirty years ago, the Dalai Lama suggested that a dialogue between Buddhist practitioners and Western scientists might be of interest and benefit to both the Buddhist and scientific communities. While science and religion are not generally considered to be natural collaborators, the dialogue that ensued has catalyzed new strands of research, most notably in the area of the neuroscience of meditation and emotion. Coming from our two disciplinary perspectives (Buddhist studies and neuroscience), we have found ourselves intrigued, excited, and at the same time critical of the Buddhism/science dialogues. We will, in our own way, carry on this dialogue among ourselves, first by laying the necessary groundwork in our respective fields, and then by exploring areas of convergence and divergence around key themes. The process will include reflection on fundamental epistemological and metaphysical commitments in traditional Buddhist thought and in contemporary science.

The first two-thirds of the semester will present basic concepts and assumptions in the fields of Buddhism, neuroscience, and physics as they relate to the study of mind and consciousness. On the Buddhist side this will entail a look at the fundamental tenets of Buddhism, including Buddhist cosmology, soteriology, and metaphysics; Buddhist philosophy of mind, self, and consciousness; and Buddhist meditation theory. On the science side this will include concepts central to evolutionary biology, chemistry, and physics; nervous-system structure and function; approaches to the relationship between brain physiology and "mind," "self," and "consciousness"; and Western scientific perspectives on the mind-matter relation more generally. The last part of the semester will explore areas of convergence and divergence, returning to such themes as: (1) varying accounts of the emergence of self and mind (both evolutionary and phenomenological perspectives), (2) the problem of free will and determinism, (3) the origins of life and the distinction between sentience and insentience, (4) death, and (5) the meaning of life.

There are two lectures and one discussion section meeting each week.

**Lecture times:** Tuesdays and Thursdays, 2:00 to 3:30 PM – 60 Evans

**Instructors:**
- David Presti  
  Department of Molecular and Cell Biology, and Cognitive Sciences Program
- Robert Sharf  
  East Asian Languages and Cultures, and Group in Buddhist Studies

**Office hours:**
- David Presti – 249 LSA  
  Wednesdays: 11:00 to 11:45 AM  
  Thursdays: 11:00 to 11:45 AM
- Robert Sharf – 3121 Dwinelle  
  Tuesdays: 3:45 to 5:00 PM

**Readings:**  
The course reader, which contains most of the readings for the course, is available at Krishna Copy Center, 2001 University Ave., Ph. (510) 540-5959. Additional readings will be distributed via the class bCourse site.

**GSIs**
- Zack Beer  
  beer@berkeley.edu  
  Office hrs: Mon.: 3:30-5:30, 3117 Dwinelle
- Zim Pickens  
  johnpickens@berkeley.edu  
  Office hrs: Wed.: 1-3, 3117 Dwinelle

The GSIs are here to help you get the most from this class. You are encouraged to get to know and talk with your GSI. Your GSI will see you in weekly discussion section and will also be available to meet with you during weekly office hours. Don’t be shy!
Discussion section times and locations:

<table>
<thead>
<tr>
<th>Section</th>
<th>Day</th>
<th>Time</th>
<th>Location</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>101</td>
<td>Fri.</td>
<td>12-1</td>
<td>247 Dwinelle</td>
<td>Zim Pickens</td>
</tr>
<tr>
<td>102</td>
<td>Tues.</td>
<td>9-10</td>
<td>237 Cory</td>
<td>Zim Pickens</td>
</tr>
<tr>
<td>103</td>
<td>Mon.</td>
<td>11-12</td>
<td>79 Dwinelle</td>
<td>Zack Beer</td>
</tr>
<tr>
<td>104</td>
<td>Mon.</td>
<td>10-11</td>
<td>179 Stanley</td>
<td>Zack Beer</td>
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Prerequisites: A desire to learn! There are no University course prerequisites for this class.

Attendance at the lectures and in discussion section is required. There is no textbook for the course, and much of the material presented in lecture is not available elsewhere. But beyond that, we believe there are important concepts and ideas that are best transmitted in-person. There is more to learning than memorizing facts, particularly in a course such as this one, even if memorizing facts is important. In addition, you will find it impossible to do well on the weekly assignments, quizzes, and exams, if you are missing class.

Assignments will consist of weekly readings and short writing assignments. The writing assignments will be one-page essays (1" margins, 10-12 point font, 1.5 to 2 line spacing). In grading the assignments we are looking for three things, namely: (1) clear evidence that you did the assigned reading(s) and are keeping up with lectures; (2) clear evidence that you took time to reflect on the assigned reading(s) and think through your response; (3) the paper, even though it is just a few paragraphs, should be clearly organized and written, free of grammatical mistakes, spelling errors, typos, and so on. Some of the assignments are quite challenging, and we do not expect you to understand everything you read. We only expect you to give it a good try. The short assignments must be handed in at the start of the lecture on the day they are due. These papers are never accepted late. Should you miss class due to unforeseen, legitimate, and documented circumstances (e.g., a medical emergency), you will be given an alternative makeup assignment.

Exams and Quizzes will consist of multiple choice, short-answer, and essay questions, drawing from material in lectures, discussion sections, and required readings. We will distribute lists of key terms and concepts to help you prepare for all quizzes and exams.

Midterm Exam: Thursday March 9, during the usual class time and place: 2:00 to 3:30, 60 Evans.

Final Exam: Monday May 8, 11:30 AM to 2:30 PM (Exam Group 2). The final exam covers material from the entire semester of lectures and readings.

Important Note: We cannot change the dates and times for these exams, and there are no makeups! Mark your calendars now. If you are unable to accommodate these exam dates, you should not enroll in the class.

Grading: Your grade in this class is based on in-class quizzes and writing assignments (50%), exam performance (midterm exam: 15%; final exam: 25%), and discussion section attendance and performance (10%). Your letter grade in the course will reflect your acquisition of knowledge and understanding of the material, and the time and effort you put into the course. Importantly, you will not be competing against fellow students—we do not curve letter grades to conform to a predetermined distribution. If everyone does well, everyone could receive good grade. If everyone does poorly, then everyone could get a poor grade. Rather than devoting energy to worrying about where grade cut-offs are, if you are truly interested in this subject and in getting the most from this class, we urge you to engage seriously from the beginning, keep up with the readings and assignments, come to all lectures and sections, and immerse yourself in the material. You will be rewarded with an understanding of some really fascinating topics. Good grades will be a natural side effect.
University holidays: no discussion sections or lectures on these days:
- Monday, February 20 – Presidents Day
- Monday, March 27 to Friday, March 31 – Spring Recess

Honor Code: The student community at UC Berkeley has adopted the following Honor Code:
“As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others.”
The hope and expectation is that you will adhere to this code.

Use of Electronics in Class: The use of laptop computers in class is not allowed. The only exception is for note taking, and only if you sit in the first row (or, if necessary, the first two rows) of the classroom. No exceptions! Cell phones must be turned off at the start of class. No texting!

Collaboration and Independence: Reviewing lecture and reading materials and studying for exams can be enjoyable and enriching things to do with fellow students. This is recommended. However, unless otherwise instructed, homework assignments are to be completed independently and materials submitted as homework should be the result of one’s own independent work.

Academic Integrity: There is a zero-tolerance policy toward plagiarism or any other form of academic dishonesty in this course. This means that anyone found taking credit for work that is not his or her own, or cheating in any other way, will receive a failing grade for the entire course. Note that ignorance of the policy is not considered a mitigating circumstance, so if you have any question about what counts as plagiarism or how to properly attribute sources, speak with one of the GSIs or instructors. For additional information on plagiarism and how to avoid it, see: http://gsi.berkeley.edu/teachingguide/misconduct/prevent-plag.html

Communication and E-mails: We like teaching this class—the material is quite amazing. We enjoy being available during office hours and after lectures to answer questions and further discuss the material. We greatly prefer in-person contact to email. We are available in office hours and following lectures for brief questions and discussion. Questions of importance or ones that require detailed answers must be addressed in person. Always be sure to see us in person about important issues. For example, it is not an acceptable excuse to say something like: “Well, I sent you an email and never heard back.” E-mail is a wonderful tool and very convenient, but it is not a substitute for direct personal contact, especially when such contact is easy, as it is with us.

Thanks again for your interest in this subject. We hope you have a very enjoyable and fulfilling experience in this class this semester!

Course Schedule: Topics, Readings, Assignments

*Note, this list is tentative and subject to revision. You are responsible for keeping up with changes, which will be announced in lecture and through the bCourse site.*

Reading numbers (#) refer to the list of readings as numbered in the “Table of Contents” in the Course Reader. In the Course Reader, the readings are listed and printed in alphabetical order according to the last name of the first author.

**Week 1:**

- **Jan 17**  Course logistics; What is consciousness?
- **Jan 19**  The "What-it-is-likeness" of Consciousness
  Reading: #24 (Nagel 1974)
  YouTube videos to watch:
  https://www.youtube.com/watch?v=gZxLUNHEmPw
  https://www.youtube.com/watch?v=a05kgcfI9D2Q
YouTube videos on the split brain:
https://www.youtube.com/watch?v=zx53Zj7EKQE
https://www.youtube.com/watch?v=u9ut6cQYcOHw

Assignment 1 (due Thursday Jan 19 at beginning of lecture): Can you find any flaws in Nagel's argument? (Something to think about: what are his assumptions, and how might they be challenged?)

Week 2:

Jan 24  Historical trajectory of physical science.
          Reading: #21 (Kuhn 1962)

Assignment 2 (due Tuesday Jan 24 at beginning of lecture): Kuhn’s article addresses the issue of predictability in scientific discovery. Reflect on why the discovery of the planet Uranus was not predictable, while the discovery of the planet Neptune was predictable.

Jan 26  Consciousness: terminological issues
          Reading: #3 (Blackmore 2005)

Week 3:

Jan 31  Historical trajectory of biological science
          Reading: #19 (Koshland 2002)

Feb 2   Introduction to Buddhism I
          Reading: #12 (Gethin 1998, Chapters 1 and 2)

Quiz (on material covered to date).

Week 4:

Feb 7   Toward a science of consciousness
          Readings: #27 (Pollan 2013); #36 (Cambridge Declaration on Consciousness)

Feb 9   Introduction to Buddhism II
          Reading: #12 (Gethin 1998, Chapter 3)

Assignment 3: According to Buddhist understanding, is nirvāṇa something that exists? (Note: we are not asking if Buddhists believe in nirvāṇa--they do! But rather, the question concerns how they understand nirvāṇa.)

Week 5:

Feb 14  Neuroscience and consciousness
          Readings: #30 (Raichle 2006); #9 (Freeman 2015)

Assignment 4: This assignment draws from the readings for 2/7 on "The Intelligent Plant" (Michael Pollan) and 2/14 on “EEG Coherence” (Walter Freeman). In addition, watch the TED Talk by Suzanne Simard (whose research is discussed at the end of the Pollan article) on networking in forests: https://www.ted.com/talks/suzanne_simard_how_trees_talk_to_each_other
If we assume for the moment that our notions of "intelligence," "mind," and "consciousness" are associated somehow with emergence of global processes from underlying component processes, how do Freeman’s ideas about EEG coherence compare to communication among plants in a forest? Could a forest have “intelligence,” “mind,” or “consciousness”?

Feb 16  Buddhist cosmology
       Reading: #12 (Gethin 1998, Chapters 5 and 6)

**Week 6:**

Feb 21  Expanding a science of consciousness
       Readings: #15 (Hameroff 2006); #11 (Gefter & Hoffman 2016)

Feb 23  Action and causality
       Reading: #26 (Ouspensky 2002)

**Assignment 5:** What (if anything!) can Osokin do to get out of his situation?

**Week 7:**

Feb 28  Neuroscience and consciousness, continued
       Readings: On bCourses, Presti (2016), from *Foundational Concepts in Neuroscience*

**Assignment 6:** Given what we know about the biology of perception and action (e.g., from readings by Freeman, Presti, etc., as well as from lectures), what are some limitations of the conventional neuroscientific framework? Should these lead you to question your daily experience of the world in any significant way?

March 2  Meditation
       Reading: #12 (Gethin 1998, Chapter 7); #5 (Buddhaghosa 2010); #42 (Young 1982)

**Week 8:**

March 7  Perception and reality; Exam review
       Reading: #11 (Gefter & Hoffman 2016) (already assigned for Feb 21)

March 9  Midterm Exam

**Week 9:**

March 14  Madhyamaka
       Readings: #8 (Dennett 1981); #10 (Garfield 2009), #17 (*Heart Sutra*)

**Assignment 7:** Based on your careful reading of the chapter by Garfield, how would Nāgārjuna approach the question posed by Dennett, in his essay “Where Am I?”. In other words, Dennett is trying to figure out where he really is. What would Nāgārjuna say?

March 16  Professor Jeffrey Kripal, Rice University
       Readings: #20 (Kripal & Coyne 2014); on bCourses, Kripal “Super Religion” (2016)
Week 10:

March 21  Radical empiricism  
Readings: #13 (Greyson 2012); #4 (Borjigin et al. 2013); #37 (Tucker 2008); #38 (Tucker 2016); #6 (Carroll 2016)

**Assignment 8:** The belief of orthodox neuroscience is that mind (or consciousness) is completely a function of the brain and body and cannot be more than that. Using specifics drawn from the readings for Tuesday, discuss whether it is possible (or not possible) to use methods of science to investigate the hypothesis that mind (or consciousness) may in important ways transcend the brain and the body.

March 23  Yogācāra  
Readings: #41 (Waldron 2006); #39 (Varela et al. 1991)

**Spring Recess**

Week 11:

April 4  Quantum physics and reality I  
Readings: #43 (Zeilinger 2000); #35 (Stapp 1996)

April 6  Religion and the Mysticism Debates  
Reading: #31 (Sharf 2000)

**Assignment 9:** Sharf seems to be arguing that the reports of UFO abductees are no more and no less credible than the reports of religious practitioners, meditators, and mystics. Is his argument sound? What sort of evidence or argument might be used to undermine or refute Sharf's position?

Week 12:

April 11  Quantum physics and reality II  
Reading: #29 (Radin et al. 2012)

**Assignment 10:** Readings for last week (Stapp 1996, #35) and for this week (Radin et al. 2012, #29) refer to a role of “consciousness” in the quantum measurement problem. How are the intended meanings that Stapp and Radin et al. give this term (“consciousness”) the same, and how are they different?

April 13  Zen  
Readings: #16 (Harding 1986); #25 (Nagel 1976); #1 (App 1995)

Week 13:

April 18  Psychedelics and non-ordinary states of consciousness  
Readings: #28 (Presti 2017); #14 (Griffiths et al. 2006)

April 20  World construction, play and ritual theory  
Readings: #2 (Bateson 1972); #40 (Vygotsky 1978)

**Assignment 11:** Bateson and Vygotsky both put forward theories that can be seen as directly linking the symbolic or representational nature of human communication to mind and consciousness. How might their theories be applied to the problem of "observation" or "measurement" seen in quantum physics?
Week 14:

April 25    Steps toward a dialogue with Buddhism
            Readings: #6 (Dalai Lama 2005); #18 (Jinpa 2010); #22 (Lopez 2010)

April 27    Buddhism, Science, and Mind
CONSCIOUSNESS: BUDDHIST AND SCIENTIFIC PERSPECTIVES (L&S 124)

## READER TABLE OF CONTENTS


17. "The Heart of the Perfection of Wisdom Scripture."


