Dartmouth College
Department of Psychological and Brain Sciences

PBS 86 07W Seminar: "The neural basis of consciousness"

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Office Hours: By arrangement
Location: We will meet in room 302
Class time: 2A

Tuesday	2:00-4:00
Thursday	2:00-4:00
x-hour Tu	4:15-5:20

Course Description: The goal of this course is to develop an understanding of what consciousness is, and how it comes into existence through the activity of neurons in the nervous system. We will be focusing on the ancient mind/body problem, but will bring the new tools of modern neuroscience to bear on this age old puzzle. The puzzle is this: Neurons are publicly observable entities; Yet the subjective experience that their activity gives rise to is not publicly observable. Indeed, subjective experience appears to have properties that do not seem to be inherent to matter, such as redness, painfulness, and other 'qualia.' The puzzle is how seemingly different classes of events, one mental and the other physical, can both be realized in one and the same neuronal events. We will begin by focusing on some of the philosophical issues. We will then increasingly focus on the neuronal basis of subjective experience in light of the recent findings of modern neuroscience.

This is a very small seminar, probably with twelve or fewer students, so we will be having a lot of discussions. The intimate nature of a seminar makes it very different from most classes in PBS and at Dartmouth. It is essential that you participate. One thing most students get too little practice doing at Dartmouth is presenting orally and visually. There will be a LOT of presenting in this seminar. I intend to have you read something for just about every class, and present what you have found to the group. In short, I envision this seminar to function somewhat like a "group brain." There is simply more to learn and read than is possible for one person given just ten weeks, so I want to divvy up the reading for the Baars book and for research articles and have us educate each other by presenting what we have read. We will be reading the Koch book together. There will be extensive time set aside for discussions in each class. Because I cannot foresee how quickly we will be able to move through the material, I have decided not to have readings fixed up front for each day (i.e. set in stone in this syllabus), since I would have to change these readings anyway. Instead, I will assign readings each week.

I foresee having an interesting mixture of backgrounds in the class. Among those who have expressed interest are students with backgrounds in biology, philosophy, anthropology, psychology and the brain sciences. All perspectives are welcome. We will all benefit from each others' knowledge.

You can buy the four textbooks at Wheelock Books. The four textbooks are:

1. Baars, B., Banks, and Newman Essential Sources in the Scientific Study of Consciousness, Bradford Books ISBN 0262523027 2003

2. Koch, C., The Quest for Consciousness: A Neurobiological Approach Roberts and Co ISBN 0974707708 2004

3. Blackmore, Susan. 'Consciousness: A very short introduction' Oxford University press,ISBN 0-19-280585 2005

4. Ramachandran, V. "A Brief Tour of Human Consciousness" ISBN 0-13-148686-1, 2004

We will begin with the two introductory level books, numbers 3 and 4. We will then go through books numbers 1 and 2 simultaneously for the majority of the course. We will read one chapter of the Koch book for each class. There are twenty classes and twenty chapters, so this works out well. We will have to read two chapters for a few of the classes. In addition, we will also read corresponding chapters from the Baars book, which I will assign. At the beginning of class I expect you to hand in a one page written summary of the Koch chapter for that day to me. And if you have been assigned a Baars chapter (we will rotate), I expect you to have written an outline of the Baars chapter or whichever research article you were assigned. You will hand this outline out to me and the others in the class, and you will orally present the contents of that chapter/article to us (just sitting and talking, no need for powerpoint for this).

In addition to weekly readings that I will assign, you will also have two major written/oral projects.

1. An independent study on a topic that we will choose together in the middle of the course (late October, presentation early November). Some of the topics that we may choose from include: The role of the neurotransmitter serotonin in altered states of consciousness; The role of gamma oscillations in the formation of conscious states; The neural basis of blindsight; The neural basis of the dreaming, etc. etc. I expect this independent project to be of a high standard, with APA-style references, and the presentation to be done using graphics and powerpoint. Expect to present for about half an hour. The written portion of this should be no less than 10 double-spaced pages and no more than 20. Your grade will depend on the conciseness and clarity of your writing, the clarity of your arguments and ideas, and the scholarship brought to bear in discussing evidence.

2. A longer, more in-depth independent study on a topic that you will choose with guidance from me, toward the end of the course (mid to late February). The written portion of this should be no less than 20 double-spaced pages and no more than 30. The same standards of excellence apply here as above. THE DEADLINE FOR THIS WILL BE MARCH 9th at 5PM. I am leaving the country on March 10th, and need time to read them.

Grades:
Class participation and mini-reports 35%
First independent project and its 30-40 minute oral presentation: 30%
Second independent project and its 30-40 minute oral presentation: 35%

My goals for this course: This is a seminar, not a lecture course. The course would be boring if I were to stand in front of the class and dictate what is known about the neuronal basis of consciousness. For freshmen a lecture format makes sense because beginners do not yet know the basics. As (mostly) juniors and seniors you have enough background in the brain/mind sciences or your own field of specialization to begin to make your own inquiries. There are two main types of inquiry that will be emphasized here. We will inquire into the readings and you will conduct your own scholarly research, and then report it to me in papers, as well as report it to the class.

Classroom discussion: The good thing about a seminar is that you can learn by making your own inquiries rather than just memorizing what is lectured to you. Because there are only a few students, it is really important that we all contribute to discussions during class. There is no such thing as a stupid question in this class. I encourage you to ask whatever it is that you want to ask. Even a question as basic as "What is a neuron?" is fine. Everybody has to learn basic things for the first time, and the best way to learn is to ask. Moreover, we will be dealing with a topic that is murky by its very nature. No one has a deep understanding of the neural basis of subjective experience. I am impressed most by a passion to understand, not by a mere dictating of facts, and certainly not by silence. It is productive to disagree with other students or with me in class. This sort of back-and-forth fosters an interesting and challenging discussion. Our main goal is to learn from each other by grappling with sometimes difficult ideas through dialog.

I realize that some of you are not in Psychology or Neuroscience. That is fine. I also realize that many of you will not end up becoming scientists or academics. Having been a student at Dartmouth many years ago, I also realize how little factual knowledge sticks with you once a course is over. However, critical thinking, honesty, skepticism, and a passion for ideas are traits that will serve you well in whatever you decide to focus on later in life.

My three children (ages 6, 4, and 1) and my wife are living in Germany this Winter. I want to go see them for one week in February, so I will miss two classes, the ones that would normally have been on Tuesday Feb. 6th and Thursday Feb.8th. Instead we will be meeting at x-hours to make up these lost days. I will also miss the first day of

class, which would have been on January 4th. Instead the first day of class will be the following Tuesday on January 9th. This will also be made up by using the x-hour. There will still be 20 classes as scheduled. In addition, we may have to find an additional time to meet outside of normal class hours to hear everyone's presentations and to see some extracurricular movies and demonstrations. We will discuss this possibility in class.

Class Schedule:

January 4 Thursday NO CLASS
1. January 9 Tuesday
2. January 11 Thursday
3. January 16 Tuesday
4. January 17 x-hr Wednesday
5. January 18 Thursday
6. January 23 Tuesday
7. January 24 x-hr Wednesday
8. January 25 Thursday
9. January 30 Tuesday
10. January 31x-hr Wednesday
11. February 1 Thursday

Feb. 6 Tuesday NO CLASS (I am in Germany on this day)
Feb 8 Thursday NO CLASS (I am in Germany on this day)

12. February 13 Tuesday
13. February 14 x-hr Wednesday
14. February 15 Thursday
15. February 20 Tuesday
16. February 21 x-hr Wednesday
17. February 22 Thursday

February 27 Tuesday NO CLASS (I am at Caltech on this day)

18. Feb 28 x-hr Wednesday
19. March 1 Thursday
20. March 6th Tuesday

March 9th FINAL TERM PAPER DUE TODAY

Final report due March 9th at 5PM. This is a firm deadline, so prepare for it. **There will be no extensions.** I will be leaving the country shortly after this, so cannot take them after this time.