

PSB 6089 – BRAIN AND MIND: FACT AND FANTASY -- 3sh

Course Syllabus Fall 2007, Aug. 27-Dec. 10

[28 class meetings, plus final exam class; holidays are 9/3, 11/12, 11/22-23]

A Seminar with Dr. Jay E. Gould
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Office Hours: Mon-Thurs 3:45-5:00pm Class Hours: Mon & Wed 2:30-3:45 p.m.
Final Exam: Mon 12/10 2:00-4:30 p.m.
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E-Mail: jgould@uwf.edu (Click on the Resources button for a
(Subject line entry: Advise Re. PSB 6089) variety of course-relevant materials,
many of which are referred to in class.)

Required Books

Phantoms in the Brain: Probing the Mysteries of the Human Mind by V.S. Ramachandran (1998). William Morrow & Co. Inc.; ISBN 0-688-15247-3

The Brain That Changes Itself (2007). Norman Doidge, M.D.; ISBN: 067003830X

Course Description

Brain and Mind: Fact and Fantasy is a graduate seminar covering often controversial issues regarding the *relationship* between the *physical brain* and the *mental processes* that make up the *mind*—i.e., The Mind-Brain Problem. This course will generally be concerned with, among other things: the *psychobiology* of perception and consciousness, emotion and reason, intelligence and language, learning and memory—all of which represent aspects of human *information processing*. Long-standing and interesting scientific questions, many of which we shall address in this seminar, are: What are the roles of *genetic and environmental/experiential factors* in determining the structure and function (anatomy and physiology) of brain, mind, and consciousness—The Nature-Nurture Problem? What are the *developmental influences* on the brain and mind? What are the roles of *hormones*? Can *thoughts* switch our *genes* on and off, thereby altering our brain anatomy and thus our minds? How *plastic/adaptable* is the

brain, and hence what are the possibilities for *neuro-rehabilitation*? What has been the *evolution* of brain, mind, and consciousness? How does the brain-body generate a sense of "self"? What is the nature of the "I" inside our heads? How are *emotion and reason* related? How do we *make decisions and deceive ourselves*—Free Will vs. Determinism Problem? What are the *functions of consciousness*? Where is *God* in the brain?

Much of our understanding and theorizing about the relationships between brain and mind comes from fascinating studies we shall read about in the first book involving *neurological patients* with, e.g., phantom limbs, neglect syndrome, blindsight, and Capgras's Syndrome (a disorder in which friends and loved ones are seen as being imposters). Then, in the second book, we shall learn how the brain, far from being fixed, has remarkable powers of changing its own structure and thereby compensating for even the most challenging neurological conditions. For more descriptions, see the book jackets, prefaces, forwards, & introductions.

Student-Learning Outcome Objectives

Objectives of this course are that as a result of careful study and fulfillment of the course assignments, students should be able (among other things) to:

1. Describe how *neuroscientists* go about *investigating* the brain, mind, and consciousness;
2. Describe the major *elements* of the nervous and endocrine systems, as well as some of the *circuits and interactions* within and between these systems;
3. Describe the *major functions* of the elements of the nervous and endocrine systems with respect to behavior and experience (*the mental trilogy of cognition, emotion, and motivation*), and explain how these functions are carried out;
4. Describe the roles and interactions of *genetic and environmental/experiential factors* in determining the structure and function of the nervous and endocrine systems, and thereby the nature of mind and consciousness;
5. Describe the apparent *relationships between brain structures and activities* on the one hand, and aspects of the *mind* (e.g., consciousness and the sense of self);
6. Describe the *causes of some major disorders* of the nervous and endocrine systems, and what can be done to treat them;
7. Describe how *emotion and reason* are related;
8. Describe where *God* might be in the brain.

Mechanisms

Objectives of this course can be attained through:

1. *Carefully studying, analyzing, synthesizing, and critically evaluating* the information in the required readings, as well as the additional material discussed in class, and then *questioning and theorizing* about the implications for potential brain-mind-consciousness relationships;
2. *Actively participating* in the class discussions;
3. *Conscientiously executing* the other assignment(s) described below.

Functions of the class meetings are to:

1. *Discuss, clarify, and expand upon* material in the required readings, as well as any additional information provided;
2. *Answer questions* raised by students;
3. *Evaluate students' mastery of the course material* through oral and written questions and assignments.

When studying the readings, please write down questions about material that you do not understand, or regarding what you want to know more about. It will be helpful if you indicate the relevant book's chapter, section, and page(s). Also write down questions and comments about any additional readings, indicating the specific article. The questions and comments should be given to the instructor at the beginning of each class. Remember, your classmates and I will depend on you to indicate what parts of the course material you want to spend the most time discussing.

Don't be afraid to ask questions and make comments! If you don't understand something, it is very likely others in the class are having similar problems. And if something interests you, it is almost certainly of interest to others as well.

Learning is facilitated by an active, dynamic involvement in the instructional process. In other words: *learning is not a spectator sport!* Therefore, rather than primarily lecturing, we will try to use, as much as possible, the *Socratic Method* of teaching by asking interesting questions. In fact, you will often be asked to try to answer the questions raised by your classmates. The goal, then, is to learn through *actively thinking about, discussing, and contributing to the course material.*

Indeed, PSB 6089 is a **seminar course** where, under the supervision and direction of a professor, students are expected to discuss and debate the material they are studying. The advantage of a seminar is that during a given semester more material usually can

be covered than in the typical lecture course, and new ideas and new approaches are formed as the class (not just the professor) analyzes, synthesizes, discusses and debates the course content in a format that is more open and less formal.

What you should be doing in class:

1. *Analyzing, synthesizing, and critically evaluating* the information being discussed, and then *theorizing* about the implications;
2. *Outlining and/or diagramming* the major points being made;
3. *Asking questions* for clarification on what is not completely understood;
4. *Responding to questions* raised by the instructor and other students;
5. *Sharing additional information or insights* when you have something to contribute.

All of this should make the class far more interesting and informative for everyone. I sincerely want you to find this course both rewarding and productive. Feel free to let me know ways in which the course mechanics might be improved, and please don't wait until the end of the term. I'm open to all suggestions--even in the form of anonymous notes left with a secretary to be placed in my mailbox.

To aid students in mastering the subject matter of the course, whenever appropriate I will provide handouts in class, or refer students to material posted on my web site. In addition, I have a bulletin board on the first floor of the Psychology Building, where there are posted short articles regarding biological psychology and other subjects that I believe students will find interesting.

Lastly, there are a growing number of great Internet resources relevant to this course. You might want to try some of the following, which I have personally looked at:
Neurosciences on the Internet at www.neuroguide.com, and its Best Bets at <http://www.neuroguide.com/bestbets.html>;
Whole Brain Atlas at <http://www.med.harvard.edu/AANLIB/home.html>;
Neuroscience for Kids at <http://faculty.washington.edu/chudler/neurok.html>;
Interactive Atlases at <http://www9.biostr.washington.edu/da.html>;
Probe the Brain at <http://www.pbs.org/wgbh/aso/tryit/brain/>;
Secrete Life of the Brain: 3-D Brain Anatomy at <http://www.pbs.org/wnet/brain/3d/>;
Anatomy of Primates (w/atlasses) <http://spot.colorado.edu/~dubin/bookmarks/b/060.html>;
Shuffle Brain at <http://www.indiana.edu/~pietsch/home.html>;
The Human Brain: Dissections of the Real Brain at <http://www.vh.org/adult/provider/anatomy/BrainAnatomy/BrainAnatomy.html>;
Visualization of Dendritic Spines at <http://www.synapses.bu.edu/index.asp>;
Comparative Mammalian Brain Collections at <http://brainmuseum.org/index.html>;
Digital Anatomist Information System at <http://sig.biostr.Washington.edu/projects/da/>

Assignments

Required Readings:

We will be reading, discussing, and elaborating on the two required books for the course. We will cover the two books in the order that they are listed on the first page of this syllabus, and at a rate of one or two chapters per week.

Concept Maps:

During the semester, students will produce *concept maps*. These are charts/diagrams used to summarize and illustrate the *hierarchical and cross relationships that exist among concepts*, such as those covered in the required readings and the associated class presentations. I have made available on my website (under the Resources link) an *Introduction to Concept Mapping* document. The document describes the principles and contains examples. I will also illustrate the technique in class.

There are many Internet sites that cover concept mapping, and these can be readily located with a computer and Internet search engine, such as Google.com. An excellent site that contains free software for concept mapping is provided by the UWF Institute for Human and Machine Cognition at <http://cmap.coginst.uwf.edu/>. You will also find instructions there for constructing concept maps that complements my website document by Joe Novak. There is also commercial software. Personally, I use *Inspiration*, which I think is excellent. This is usually available for a 30-day free trial, and can be found at <http://www.inspiration.com/productinfo/Inspiration/index.cfm>.

Oral Reports and Written Materials:

The required books for the course will provide a solid base of knowledge. In addition, however, we will delve deeper into the subject matter of this course through analysis, synthesis, evaluation, and discussions of the theoretical implications and practical applications of *other contemporary, as well as notable historical, scholarly publications*.

After the instructor covers the preface and first chapter of *Phantoms in the Brain* (this will take about 2.5 hours of class), we will cover the remaining required book readings by having each student take prime responsibility for leading the class in discussions on one or more chapters, or portions of chapters, of each of the two books. Any author- and/or presenter- suggested demonstrations/activities could add interest and value to the discussions.

The student leader must integrate into the discussions one or more research or theoretical scientific articles or books that illustrate, clarify, expand on, or contradict the material in the required book readings. Whenever possible, this should be done with particular emphasis regarding the *relationship between brain and mind/consciousness* (i.e., the *mental trilogy* of cognition, emotion, and motivation), and with regard to whether the relationship appears to be *fact or fantasy*. The information in the additional research/theoretical scientific articles should not only be integrated but also critically

evaluated (compared and contrasted) with respect to related material in the required book readings for the course.

Note: It is *not possible* to cover in a presentation everything that is in the required reading, nor is it a desirable way to spend our time when we all come together for elaboration, discussion, and debate. Everyone is expected to read the required material before class, so just briefly summarize the required reading, discussing the parts you found most important or interesting (explaining why), and then focus your presentation on the additional related scientific information you found in other publications.

To guide the class discussions on the material being covered, the student presenter will prepare a screen-projected *concept map*, with printed copies for the class.

To allow time for the instructor to elaborate on the required reading and the presentation--through verbal discussion and/or use of videos--and to allow time for quizzes, **student-led class discussions should be planned to last only 45 minutes.**

As aids to finding appropriate articles or other books, see the suggested readings and references in the required books for the course. Computer databases such as *PsychInfo*, *PsychLit*, *Social Science Citation Index*, and *Current Contents* are, of course, other important resources for finding useful material.

Assignment of book chapters for which students will lead discussions can be done *randomly*, unless students have a strong desire to be assigned specific chapters—which is the norm. In that case, students will be required to submit their *first, second, and third chapter choices* for each of the books. When there is overlap in the first choices, then students can try to work it out through discussions with each other. If that is not successful, then the instructor will make the decisions as fairly as possible. Decisions for the 1st course book should be made during the first week of class. Decisions for the 2nd course book should be made around the 3rd or 4th week of class.

Before the class meeting of a led discussion, the student should give to the instructor:

1. *A printed, detailed concept map* (see examples under the Resources link on the instructor's website) of the required book material being covered. This should also help the presenter. At the top of the concept map should be the book title, chapter number and title, followed by the student's name and presentation date.
2. *A good photocopy* of the additional research/theoretical journal article(s) that will be integrated into the discussion, or in the case of a book, a photocopy of several important summary pages as well as the book's cover pages.
3. *A quiz of ten typed, multiple-choice questions*, with approximately the first half based on the major points in the chapter being covered, and the rest based on the student's additional material being presented for discussion. Each question should have four alternative answers, and on just the instructor copy the *correct answer* for each question should be indicated by an asterisk placed before it.

Note that the alternative, potentially correct answers to each question should be written in as parallel and clear a fashion as possible. This is to avoid giving away the correct answer and to avoid ambiguity. Developing the quiz will be a useful learning exercise for presenters, and the quizzes will actually be used to test classmates on their mastery of the covered material.

At the class meeting when the discussion will be led, the student should bring:

1. Copies for everyone of useful *handouts*, such as *concept maps and outlines*;
2. Copies for everyone of the *quiz* (*without* the correct answers indicated of course). If there is time, this will be administered in class after the presentation, graded by classmates, and then turned in to the instructor to be recorded and later returned. If there is not sufficient class time, the quizzes will be take-home and graded at the beginning of the next class.

When giving an oral report, the student should:

1. *Give an introductory overview* by stating the major theses (propositions or contentions) presented in the assigned book chapter by the author, as well as any differing major propositions of the presenter;
2. *Briefly review and discuss*, using a concept map as a guide, and possibly also an outline, *the major information in the assigned book chapter* (use no more than half the presentation time for this);
3. *Compare and contrast* the assigned book reading with information from the *selected additional scholarly article(s)/book(s)*—i.e., critically analyze, evaluate, and synthesize the relevant material in the required book chapter with respect to the selected additional reading(s), using at least half the presentation time;
4. *Conclude with a take-home summary message (major points) as well as a proposal* for further research or theoretical work.

Grading/Evaluation System

Student-Led Discussions (50% of course grade):

These will be evaluated at their conclusion using a special form prepared by the instructor, with greater weight given to earlier items in the listing (see example attached at end of this syllabus). Note that significant weight will be given to the quality of the presentation, discussion leadership, concept map(s) and any other aids, and the quiz questions. Experience with all these will provide valuable *teaching exercises* for students, as well as insights into the challenges of being an instructor.

Written and Oral Quiz Questions plus Take-Home Assignments (50% of course grade):

Because this is a seminar course, the instructor will not be evaluating mastery of the material through the typical formal course exams, each covering several chapters. Instead, as already indicated, the instructor will use performance on the written quizzes prepared by the student discussion leaders, which will be administered following each presentation. This will encourage students to continuously keep up with the material, and to be actively involved in class discussions. In addition, the instructor will at times ask oral questions during class meetings, and might evaluate the quality of the answers.

Typically, the written and oral questions should focus on *major points* from the required readings, the additional scholarly articles discussed by the student leaders, instructor handouts or web postings that are referred to, and videos that are shown. It is intended that the questions will focus on *significant conceptual or problem-solving issues*. This should reduce student anxiety about what questions might be asked, and should encourage students to *actively and creatively think about the material being studied and discussed*, rather than simply trying to commit to memory numerous minor details. Keep in mind, however, that students will be expected to be able to provide clear, concise definitions of key concepts/terms discussed in the books. Students will also sometimes be asked to answer questions raised by their classmates, before the instructor gets involved--if necessary. Note that in order to illustrate their answers, students might be asked to draw and/or interpret figures, tables, or concept maps.

Answers to the written quizzes and oral questions will be scored on a 10-point scale, with 9.0 to 10.0 points representing the range of A- to A, 8.0 to 8.99 the range of B- to B+, etc. If an oral answer is not entirely accurate or complete, other students might be given an opportunity to provide additional information and receive *extra-credit points*. Therefore, it is very important to pay careful attention to what classmates are saying. Moreover, the instructor will provide feedback and elaboration, when appropriate, and subsequent questions may be based in part on this elaborated information.

In addition to making the seminar class meetings very *interactive*, as they should be, and no doubt much more exciting and meaningful, the *active, dynamic approach to learning and evaluation* that will be used in this course should result in greater mastery, superior retention, and better future application of the important information covered during the semester. I hope you agree, but let me know if you think otherwise.

Short, written, pop quizzes may periodically be administered by the instructor when it is desirable to test all students on some important point not covered by student-generated quizzes. The answers might require generating concept maps, or completing concept maps, e.g., labeling the links between concepts (see example and handout of concept maps). These will typically be scored on either a 5- or 10-point scale.

Long, formal, written examinations will be used only if students do not demonstrate mastery of the course material through the above mechanisms. Naturally, we would all very much prefer that this not be necessary.

Take-home assignments will be given during the semester. These will relate to the material being covered in the readings, class discussions, or videos shown.

Examples:

1. For the book *Phantoms in the Brain*, generate an outline, by chapter, of all the syndromes, giving descriptive definitions of what is known about the brain anatomy and/or physiology involved, and what our knowledge about the syndromes indicates/suggests about the operations of the mind (it might help to think in terms of the Mental Trilogy: cognition, emotion, and motivation). This assignment should be turned in within two weeks after we finish reading the book for the course. It's easiest and best to work on the assignment while we read and discuss the book. The assignment will provide you with a useful summary of major points in the book, and it will provide the instructor with evidence of what you have learned.

Format for the summary outline (note bolding and use of colons):

I. Chapter Number and Title

A. Syndrome Name

1. Syndrome Definition:
2. Brain anatomy:
3. Brain Physiology:
4. Operations of the Mind:

2. For the last day of class (Final Exam meeting), prepare a one to two page concise summary of the most interesting theses, concepts, principles, and/or mechanisms you learned from the second book for the course. Also, indicate whether you believe the author(s) fully supported the positions taken in the book.

Integrative Concept Maps: The construction of concept maps, as you will learn, is a challenging but very helpful technique for organizing, clarifying, and mastering bodies of information, which also facilitates retrieval and application of knowledge. That is why you are required to prepare them for leading class discussions. They are also very useful tools for evaluating an individual's understanding of course material and other information.

Students might be required to prepare concept maps integrating concepts across several chapters of the required readings. These would be done on large poster boards (available at book stores and art/hobby supply stores).

Exceptional Class Participation: In assigning the course grade, the instructor additionally will consider the quality and quantity of participatory contributions that students make to enhance the learning experiences of the class, such as enlightening elaborations or clarifications of information being presented by the instructor or the discussion-leading classmate.

Attendance: Coming to class for every meeting is obviously *critical* in a seminar course. Therefore, please be forewarned that having exams in other courses, work conflicts, or more pleasant things to do on the same day as class are not sufficient justification for missing class. On the other hand, an illness is sufficient justification. If you are unable to come to class, do not call the instructor. Instead, submit a printed statement (e-mail is fine), no later than the next class meeting, which documents the reason for missing class. Missing class without sufficient justification will adversely affect your grade.

Special Arrangements for Assistance: Students with special needs who require specific examination-related or other course-related accommodations should contact the Director of Disabled Student Services (DSS), at (850) 474-2387. DSS will provide the student with a letter for the instructor that will specify any *recommended accommodations*. Students should attend to this as early as possible. The instructor is not obligated to accommodate a student's needs unless presented, in a timely fashion, with an official letter from the Office of Disabled Student Services.

Academic Dishonesty: I am very aware that there is a great deal of pressure to do well in college. But that is never an excuse for cheating on an exam/quiz, plagiarizing an assignment, or in any other way being academically dishonest. There are severe penalties for such wrongdoing. Do the right thing and be a good citizen--be honest! You should carefully review the Rights & Regulations section of the *UWF Student Handbook*, from which the following was excerpted.

Expectations for Academic Conduct/Plagiarism Policy: As members of the University of West Florida, we commit ourselves to honesty. As we strive for excellence in performance, integrity—personal and institutional—is our most precious asset. Honesty in our academic work is vital, and we will not knowingly act in ways which erode that integrity. Accordingly, we pledge not to cheat, nor to tolerate cheating, nor to plagiarize the work of others. We pledge to share community resources in ways that are responsible and that comply with established policies of fairness. Cooperation and competition are means to high achievement and are encouraged. Indeed, cooperation is expected unless our directive is to individual performance. We will compete constructively and professionally for the purpose of stimulating high performance standards. Finally, we accept adherence to this set of expectations for academic conduct as a condition of membership in the UWF academic community.

REPORT EVALUATION FORM

PRESENTER: _____ DATE: _____ EVALUATOR: _____

	A 100-90 EXCELLENT	B 89-80 GOOD	C 79-70 FAIR	D 69-60 POOR	F 59-0 FAIL
1. Understanding of Material and Leading of Class Discussion					
2. Quality and Clarity of Presentation, Handouts, & Quiz					
3. Theoretical or Applied Value of Additional Articles/Books					
4. Depth of Information					
5. Breadth of information					
6. Integration of Research					
7. Evaluation of Research					
8. Poise During Presentation					
9. Articulation when Speaking					
10. Enthusiasm for Subject					
OVERALL (Numeric Value)					

CONSTRUCTIVE COMMENTS OF EVALUATOR: