BILD 38 -- Winter Quarter 2011

Dementia/Science/Society

SYLLABUS

INSTRUCTOR: Eduardo Macagno
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OFFICE HOURS: Tue, Thu, 9:30 -11 am

CLASS MEETINGS: Pepper Canyon Hall, Room 120
Tuesday-Thursday, 8:00 AM to 9:20 AM

TAs: Name	email	Time & Location:
Amy Buck	(ambuck@ucsd.edu)	Center Hall 217B
Victoria Dardov	(vdardov@ucsd.edu)	York 3000A
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COURSE WEBSITE: http://www.biology.ucsd.edu/classes/bild38.WI11

LIBRARY GUIDE WEBSITE: http://ucsd.libguides.com/bild38

COURSE DESCRIPTION

The overall goal of this course is to introduce students who are not majoring in biology to basic human neuroscience leading to a discussion of brain diseases classified under the rubric Dementia. Topics will include the fundamentals of human brain structure and function, the changes underlying aging and brain diseases, particularly Alzheimer's but also others, whose prevalence in an aging population is creating an increasingly difficult healthcare load and tremendous social, political, ethical and legal impacts on our society.

> Our brains participate in every aspect of our lives, from simple bodily functions to our most abstract thoughts. Our identities are the sum of our stored memories and our interactions with our environments. How do *ensembles* of brain cells (neurons and glia) working together sense the environment, generate responses and behavior and generally control these processes? We will discuss how networks of neurons function, and how these networks mediate sensation, movement, memory and some other higher functions, and focus on what changes accompanying aging may lead to dementia and how biomedical research is addressing these diseases and their grave consequences.

As a course offered by the Division of Biological Sciences, we will emphasize acquiring a general understanding of the biological and medical aspects of the subject while also considering human dementia in its societal context. As a non-majors course, there are no specific course pre-requisites, but enrolled students are expected to have a strong interest in the subject, enough to do a significant amount of outside reading and to explore current sources of information regarding dementia research, treatment, consequences and socioeconomic costs. Students will be expected to read and report on the current news about dementia, and to carry out a team research project on some related area.

EXPECTATIONS

In practical terms, the course will be comprised of (1) a series of introductory lectures and discussions of basic neuroscience, including some presentations by experts on the medical aspects of dementia, followed by (2) a series of presentations and discussions of special research projects by teams of students enrolled in the course. Although the projects will be done in teams, each student will be expected to turn-in a report (8-10 page, double-spaced) of the project **in their own words**. Students will be able to select which project they prefer to participate in. In addition, students will be expected to email weekly short summaries of news articles related to dementia and their project area. The goal is to become knowledgeable about the critical importance of this subject to the future of humanity.

Since this is the first time I will be offering this course, I expect that some mid-course corrections will be in order. I plan to make the course as participatory as possible, with some "lecturing" but a lot of discussion and student involvement. Thus classes will always have at least 25 minutes of discussion and students are expected to come prepared to raise questions and to provide new knowledge.

DISCUSSION SECTIONS

Attendance to a discussion section is required. Students in each section will carry out a project as a team, and will be expected to present and discuss their findings in Section prior to the class presentation in the last 2-3 weeks of the course. In addition, the TAs will discuss and respond to questions on the material covered in class that will be included in the quizzes. Weekly news summaries will also be discussed in sections as well as in class.

READINGS

Textbook: No specific text required;

There are many textbooks in the Biomedical Library that cover the scientific and medical contents of this course, but generally in far more detail than I plan to cover them - you may like to consult these if you wish to to explore the subject in more depth, but there is neither requirement nor suggestion that you should. An excellent book that is at the appropriate level, but which we will not cover in its entirety and hence I am not requiring, is Memory: From Mind to Molecules, by Larry Squire (who is on the UCSD faculty) and Eric Kandel. This is a book you might like to own and can get for a good discount on the Web, but I will ask the library to place it on Reserve.

Papers: PDFs of papers and URLs where papers can be read or down-loaded will be assigned prior to each class period. These readings will be required.

GRADES

Grades will be based on:

1. **Performance in 2 out of 3 quizzes (40%)**
2. **Emailing news summaries on a weekly basis (20%)**
3. **Project paper and participation in group presentation/discussion (40%)**

Missed quizzes: The only valid excuse for missing an exam that permits you to request a make-up exam is a medical reason or a family emergency. Appropriate documentation is required. Since only **two** out of the **three** exams count towards your grade, you can miss one of them without penalty. Thus you can only request a make-up if you have to miss more than one exam.

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CLASS SCHEDULE

DATE	SESSION	TOPIC
Jan 4	1	Is Dementia an Epidemic? Demographics, Types of Dementia, Symptoms, Consequences; Costs; Plan for the Course
Jan 6*	2	Research Resources in Biomed Library (DT); AD Patient Interview (MR)
Jan 11	3	The Human Brain: Major Structures; Functional Imaging
Jan 13	4	The Human Brain: Cellular Components; Neurons and Glia; Circulation
Jan 18	5	Signaling within and between Neurons; between Neurons and Glia; Synapses
Jan 20	6	Sensory and Motor functions, pathways
Jan 25	7	QUIZ # 1 --- On Materials Covered in Periods 1-6
Jan 27	8	Plasticity; Learning; Motor and Non-Declarative Memory
Feb 1	9	Declarative Memory; Consciousness; Subconscious Communication
Feb 3	10	Aging of the Brain; Neurological Diseases: parts of the brain affected
Feb 8*	11	Putative Causes of Dementia and other Neurological Diseases (MR)
Feb 10*	12	Drug treatments sand Clinical Trials; New Directions (WM)
Feb 15	13	General Discussion and Scheduling of Presentations
Feb 17	14	QUIZ # 2 --- On Materials Covered in Periods 8-12
Feb 22	15	Project 1: Therapies for Enhancing Cognitive power, Delaying Memory Loss
Feb 24	16	Project 2: Ethical Issues in the Diagnosing and Treatment of Dementia
Mar 1	17	Project 3: Programs that Provide Affordable Human Support Systems
Mar 3	18	Project 4: Design of Dementia Patient Care Facilities
Mar 8	19	Project 5: Funding a Healthcare System with an Increasing Dementia Population
Mar 10 --- Mar 16	20	QUIZ # 3 --- On Materials Covered in Periods 15-19
	21	**Final Project Reports Due**

* Guest Speakers: Drs. William Mobley and Michael Rafii; Dominique Turnbow