Bio 330: Diseases of the Nervous System (DNS)
Fall 2012 Agnes Scott College

Instructor

Instructor: Dr. Jennifer Larimore
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Office Hours: M, T, TR 10:15-11:15 AM or by appt.

Required Text and Materials:

1. Principles of Neural Science. Kandal, Schwartz, and Jessel. 4th Edition. McGraw-Hill Companies. Copyright 2000. ISBN 0-8385-7701-6
2. 1 laboratory notebook for class, Composition style.

Course Description:

This class examines the cell types that make up the human brain and how each of these cell types function properly to make us who we are. We will examine the sub-cellular nature of several different neurological diseases to fully understand the important functions of individual brain cells.

Course Objectives:

Upon successful completion of this course, the student will achieve the following objectives:

- Demonstrate knowledge of the different types of cells, how individual brain cells work and communicate.
- Demonstrate knowledge of altered brain cell function to neurological diseases.
- Relate and present primary journal articles, demonstrating analytical thinking.
- Demonstrate proficiency in designing a neurobiology experiments.
- Be able to translate basic knowledge and proficiency into a grant.

Grading Policy:

The final grade for this course will be based on the following:

Exams	15% (3 Exams, 5% each)
Grant	15%
1 Final	10%
Article Reviews	20%
Journal Entries	25%
Quizzes	10% (10 quizzes)

Grading Scale

A =	92-100%
A- =	90-91.9%
B+ =	88-89.9%
B =	82-87.9%
B- =	80-82.9%
C+ =	78-79.9%
C =	72-77.9%
C- =	70-72.9%
D+ =	68-69.9%
D =	62-67.9%
D- =	60-62.9%
F =	below 60.0

Course Work:

Lectures:

Class lectures will be interactive, therefore reading the assigned chapters ***prior*** to class arrival will further your understanding of the material and will prove beneficial to your overall experience within the class. **Come prepared to participate in class discussions** on both the text material and any assigned readings. Lectures will cover the basic science needed to better understand the articles and the diseases we will be covering.

Article Presentations:

Following a class lecture in basic neurobiology, a peer-reviewed article from primary literature will be assigned for further study (see syllabus for articles listed). The class will be divided into 3 groups to present the information contained within the article to the rest of the class. Article presentations will be 45 minutes each. Groups will alternate weeks, so you present every 3 weeks. You will be graded on content, quality and quantity. Part of your grade will also be based on anonymous grading by your group members in regards to **everyone's active participation**. The grading sheets are on Moodle.

Journal Exercises:

During one of the class hours, we will design experiments that would further the article we discussed in the previous lab session. Experiments will be graded based on the following:
(1) Experiments must follow the scientific method and include (2) a well-stated hypothesis and (3) and clear, well-founded predictions. The experimental design needs to *be thorough, creative, and achievable* with current technology. The grading sheet is on Moodle.

Grant:

The major project for this class will be preparing a 2 page grant based on one of the new experiments you create in your lab notebook.

The grant will include

(1) Background information on your hypothesis (approximately 2-3 paragraphs)

(2) Your Novel hypothesis (1 sentence, a conclusion sentence to your background section)

(3) Specific aims that will address your hypothesis (Each aim is a bullet point, and experiments described for each aim should be 3-4 sentences)

(4) "Preliminary" data form your experiment you designed (Discuss the "data" from the experiment you designed – how it demonstrates what an amazing project you have in mind, and how it will blaze new trails in science)

(5) Works cited. Give credit where credit is due. Use Journal of Neuroscience formats.

You may hand me a draft of the grant at ANY time during the semester and I will give you comments on it before 11/14/2012. Then, as a class, we will review the grants anonymously in class and lab on 12/3/2012. Anyone entering the medical field or one of the many academic science fields will, at some point in her career, need to write a grant. This project aims at learning the fundamentals behind good grantsmanship. The grading sheet is on Moodle.

Quizzes (see schedule for tentative dates):

We will have short quizzes at the beginning of ***each*** lab session. This allows you to study small pieces of the lectures to prevent you from cramming for the tests. The hope is that you will retain more knowledge this way (we will talk about this in the learning and memory section). Each quiz will be no more than 5 questions.

Exams (see schedule for tentative dates):
There will be exams spaced throughout the semester with a **cumulative final** exam at the end of the semester. The exams will be written to assess your understanding of the information covered in class and your ability to **apply** and **analyze the information using higher order thinking skills** by answering short answer questions.

Academic Policies:

Attendance and Deadlines for Class

Attendance and participation will be assessed periodically, to determine your engagement and commitment to this class. Students are expected to attend all class periods, except in cases of documented illness or emergency. If a missed class cannot be avoided because of illness or emergency, it is **STRONGLY recommended** that you contact me **IN ADVANCE**, or within 24 hours of the class period, so that I am aware of the circumstances. Should an emergency or crisis arise, such that you miss class, you must provide legitimate documentation to me, in order for me to consider allowing you to make up missed work.

It is your responsibility to keep up with the class material. Thus, if you miss class, it is up to you to find out from a reliable source if you missed an assignment (you can always e-mail me), and it is your responsibility to obtain the class information from a peer. It is also your responsibility to stay on top of presentation, quiz and exam deadlines. In-class assignments (such as the experimental design projects), presentations, and quizzes will NOT be available to make up later, unless you have a documented excuse, OR you have contacted me ahead of time. Approved absence requiring you to miss a presentation can be made up by a written report of that presentation. Approved absences requiring you to miss an experimental design day will be made up by writing an experimental design of your own without the use of the group.

In conclusion: **YOU EARN YOUR GRADE, AND YOU ARE RESPONSIBLE FOR IT AT ALL TIMES**.

Directly from the student handbook:

The Honor System:

Honor & Pledge

1. The success of the Honor System depends on the student's responsibility to the Honor Code and on her knowledge of academic regulations. Living in the Agnes Scott community, a student is on her honor not to ask for or give any information before or after she has completed a graded assignment or taken an examination.
2. On any graded homework, paper, quiz, test or exam, each student must write the word "pledged" and sign her name to signify that she has neither given nor received aid on the assignment.
3. Students should consult their instructor or a member of the Honor Court when they are not sure if an intended action regarding preparation of work is in accordance with the Honor Code.
4. Students who witness Honor Code infractions are reminded of dual responsibility. Your first responsibility as a witness is to encourage the violator to step forward of her own accord; if she refuses to do so, then in accordance with the Honor Code it is your responsibility to report the nature of the violation witnessed.

Directly from the student handbook:

Plagiarism

Agnes Scott is an academic community and the identity of an academic community is rooted in intellectual honesty, a principle that fosters the free exchange of ideas and gives full credit to the originators of those ideas. Students become members of this community upon enrollment; their participation in class discussions and their fulfillment of all oral and written assignments teach them how to bear the responsibilities of membership. Writing papers, for example, is a valuable exercise in learning about the subject matter and in acknowledging the writer's debt to those who have written or spoken on the subject before. In preparing written work properly with complete and accurate attention to documentation and other forms of acknowledgement, the students demonstrate their support of academic honesty and fulfill their responsibility as members of the community of scholars.

According to Webster's Ninth New Collegiate Dictionary (1983), to plagiarize is "to steal and pass off the ideas and words of another as one's own, to use a created production without crediting the source, to commit literary theft: [to] present as new or original an idea or product derived from an existing source." In written work, plagiarism means taking another author's ideas or ideas from a source that has no listed author (such as some websites) and copying them or rephrasing them in one's own words without acknowledging the origins of those ideas. Omitting or "forgetting" to include parenthetical references or footnote numbers or failing to use quotation marks to set off borrowed words or phrases all constitute acts of plagiarism.

Copying from print or Internet sources without attribution is the most blatant kind of plagiarism. Some incidents of plagiarism arise from careless research and note-taking methods or from simple failure to learn the correct way to cite a source. While efforts are made in first-year English courses as well as most other courses to explain the relevant forms of documentation and the proper methods of citing sources, the student bears the responsibility for learning and using these methods. There are many ways to gain such knowledge. Instructors and Writing Center tutors are always ready to answer questions about documentation or to help the student find the answer. The college handbook, The St. Martin's Handbook, offers extensive explanations and examples of a number of documentation styles and the library and the Center for Writing and Speaking have numerous references with detailed explanations and examples. "I forgot" or "I didn't know" are not acceptable excuses for inaccurate written work that may be seen as plagiarized.

Plagiarism is contrary to the academic purposes of Agnes Scott. In her work, each student is to develop techniques of independent thought; research using another's work as one's own defeats the development of these techniques. Incidences of plagiarism fall within the jurisdiction of Honor Court pursuant to Article IV, Section 2.D.1.a of the Constitution of the Student Government Association and follow the procedures of Honor Court. In addition, under federal and state laws, plagiarism is illegal and punishable by either fine or imprisonment or both. Thus, plagiarism is a serious violation of the standard of our academic community and of governmental law.

Students found guilty of plagiarism are subject to suspension or dismissal. All penalties are discussed in the HONOR COURT section of this handbook.

Date	Topic
W 8/29	Syllabus review, project review, presentation review
M 9/3	*Labor Day*
W 9/5	**"Size matters"** Neuronal Structure Lecture (Before class, read: Kandel, Chapter 4 pg 67-87)
M 9/10	Quiz on "Size Matters" "**That's just the chemical talking."** Chemical Exchange at the Synapse Lecture (Before class, read: Kandel, Chapter 14 pg 254-277 and Chapter 10 pg 175-186)
M 9/10 Lab	Small groups present primary research article on Fragile X spine formation: Group 1 Introduction and Background, Group 2 Materials and Methods and Group 3 Results and Discussion

Automated 4D analysis of dendritic spine morphology: applications to stimulus-induced spine remodeling and pharmacological rescue in a disease model Sharon A Swanger, Xiaodi Yao, Christina Gross and Gary J Bassell *Molecular Brain 2011*

W 9/12	Quiz on "That's just the chemical talking" / design Fragile X experiments
M 9/17	**"I'll teach you the Electric Slide"** AP Lecture (Before class, read Kandel, Chapter 9, pg 150-169)
M 9/17 Lab	design experiments
W 9/19	Quiz on "I'll teach you the Electric Slide"/ Group 1 presents an article
M 9/24	*REVIEW FOR EXAM #1*
M 9/24 Lab	design experiments
W 9/26	group 2 presents an article
M 10/1	**"What is normal?"** Synaptic Plasticity Lecture (Before class, read: Kandel, Chapter 51, pg 998-1013)
M 10/1 LAB	EXAM #1: **"Size matters" "That's just the chemical talking." "I'll teach you the Electric Slide"**
W 10/3	Quiz on "What is normal"/ Group 3 presents an article
M10/8	**"Even the brain has duct tape."** Glia (Before class, read: p19-21)
M 10/ 8 LAB	design experiments
W 10/10	Quiz on "Even the brain has duct tape." / group 1 presents article
F 10/12	*Fall Break (rest your neurons)*
M10/15	Society for Neuroscience – No Class
M 10/15 LAB	Society for Neuroscience – No Class
W 10/17	group 2 presents an article

M 10/22 **"The FedEx of the Neuron"** Trafficking Lecture (Before class, read: Kandel, Chapter 5, pg88-104)

M 10/22 LAB design experiments / work on grant

W 10/24 Quiz on "The FedEx of the Neuron"/ group 3 presents an article

M 10/ 29 **"Better than an elephant."** Molecular Basis for learning and memory
(Before class, read: Kandle, Chapter 63, p 1247-1277)

M 10/ 29 LAB Review for Exam #2 / design experiments

W 10/31 Quiz on "Better than an elephant." / group 1 presents an article

M 11/5 "**I slept through my alarm...again"** Circadian Lecture (Before class, read Kandel, chapter 47, p936-959)

M 11/5 LAB **Exam #2 : "What is normal?" "Even the brain has duct tape." "The FedEx of the Neuron"**
"Better than an elephant."

W 11/7 Quiz on "I slept through my alarm...again."/group 2 presents an article

M 11/12 **"When protein's don't recycle."** Dementia Lecture (Before class, read: Kandel, Chapter 58, pg 1149-1161)

M 11/12 LAB design experiments / work on grant

W 11/14 Quiz on "When proteins don't recycle"/ group 3 presents an article
GRANT DUE BY 2:00 PM

M 11/ 19 **"Let's get a move on!"** Basal Ganglia Lecture (Before Class, read: Kandel, Chapter 43p853-867)

M 11/19 LAB design experiments

W 11/21 Quiz on "Let's get a move on"/ review for exam #3

Thursday Nov 22 – Sunday, Nov 25 – Thanksgiving Break

M 11/26 *REVIEW OF HOW TO READ THE GRANTS.*
ASSIGNED GRANTS FOR STUDY SECTION – *READ YOUR GRANTS BEFORE 12/3*

M 11/26 Lab Read grants

W 11/28 **Exam #3 "I slept through my alarm….again." " When proteins don't recycle" "Let's get a move on"**

M 12/3 Study Section

M 12/3 LAB Study Section

W 12/5 Final Exam Review – Cumulative
Final Exam Time **Dec 13 - 18**