Chemistry 109 – Neurochemistry

MWF 10:10-11:00 Text – Meyer & Quenzer, Psychopharmacology

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Office hours M & W 11:10–1pm or email for appointment

Course Description –

This course offers a description of the central nervous system's (CNS) structure and function in terms of molecular processes. The course begins with a brief introduction to central nervous system and neurocellular anatomy and then builds chemical foundations using examples such as neurotransmitters and receptors. Once these basics are established, we will use our knowledge to examine topics such as the biochemistry that underlies neurological disorders and the chemical reactions and interactions that are associated with psychoactive drugs.

Words of Wisdom –

If you have a question or are having difficulties with a concept get help RIGHT AWAY! Chemistry is cumulative, so the small questions you have today could easily become tomorrow's nightmare…

Googling for answers – not ideal. Always study deep, i.e. work to solve problems using the knowledge stored in your brain. Googling for the answer will not allow you to understand where your strengths and weakness lie.

Moodle Page (moodle.kenyon.edu) –

- Student Lecture Notes – available by midnight the night before lecture
- Access to on-line quizzes - *announced in class, available by noon on designated Fridays*
- Discussion Papers, Handouts, etc.

Where to get help???

Me – Visit me during office hours, make an appointment, etc. I don't care about your past history on exams, etc. I am interested in helping you discover your inner chemist and help you improve your chemical knowledge – your future is not dictated by your past.

Math & Science Skills Center (MSSC) – Tues, Thur, Sun 7-10pm.
Drop in anytime the center is open for help on class work. (First come, first served.) Their mission is to help you improve your understanding of class concepts and they will not judge you based on what you do/don't know at the present moment.

Evaluation –

Exams (2)	35 %
Final	20 %
Quizzes	20 %
Project	15 %
Homework, Seminar Summary & Participation	10 %

Letter grades for the course qualitatively correspond to:

A: excellent work. Mistakes are rare. Unusually good effort.

B: very good work. Some mistakes, but major concepts are well understood. Good effort.

C: good work. Small mistakes are common, but the major concepts are understood. Good effort.

D: poor work. Major conceptual mistakes. Effort is not enough.

F: unacceptable work. Major conceptual mistakes are common. Effort is minimal.

Attendance at Exams and Quizzes

There are no make-up exams or quizzes.

Exams/quizzes are to be taken on the day and at the time specified.

Other arrangements can be made ONLY if your name appears on the official *Excused Absence List* from the Dean's Office or I receive a Doctor's note.

- If you have a legitimate need to be excused, we can work out another earlier time for you to take the test, however you must contact me in advance.
- If you have a serious unanticipated emergency and need to miss an exam, contact me and the dean of students as soon as possible so we can make alternate arrangements.
- **If you do not live up to these responsibilities** you will receive a **zero** for that exam.

Exams –

Two 50-minute exams will be given during the semester on the dates October 2 and November 13. The final is scheduled by the registrar

Weekly Quizzes – none given in Weeks 7 and 14

There will be 12 quizzes given throughout the semester and the lowest grade will be dropped. Unless otherwise announced, the quizzes will be given via the class Moodle page. The Moodle quizzes will open at 5pm on Thursday and are due by 10pm on Sunday. The focus of the quizzes will be material covered since the last quiz, however previous information may also be included.

Seminar Summary

The energy and excitement of science is often conveyed in the seminars you can attend on Kenyon's campus and it is important to dip your toes in this world. To that end, you will automatically earn credit toward your final grade if you attend any chemistry, biology, math, neuroscience, physics or psychology seminar* **and** write up a one-page summary of the seminar and submit on Moodle. The summary should include: speaker's name, date, title of talk, and, as you interpret it: goals of work, background/foundation of work, basic result of experiments, conclusions. (Write up should not take more than 1 hour.)

*Ask if you think there is another seminar that might be chemistry based.

To prepare for the exams and quizzes do the homework, ask questions, and try to make links between the course work and your everyday life.

When doing homework, do it without looking at similar examples. When finished with a problem try to *thoroughly explain* how you got to the solution or try to explain the background of the formula you used. The process of solving and explaining the problems forces you to confront and understand the depth of your knowledge, it also starts to burn the concepts into your brain such that you will have faster recall on the exams. ***Warning*** *– Normally the time you have to take the exams will not allow you to ponder a question at your leisure, you need to have the concepts ready for instant recall and integration.*

Exam post-mortems:

Exams and quizzes will constitute a major portion of your grade in this class. Do not treat them as an annoying inconvenience that you just forget about after the exam or quiz is finished. Instead, when the exam/quiz is returned, look at it as an indicator of what areas are challenging you, what types of questions you are having trouble understanding, etc. Once this post-mortem has been accomplished, make sure to get help with any problems as soon as possible. (And if you don't want to analyze the exam by yourself, ask me or MSSC staff to work with you.)

Academic Honesty

At Kenyon we expect all students, at all times, to submit work that represents these standards of academic integrity. It is the responsibility of each student to learn and practice the proper ways of documenting and acknowledging those whose ideas and words you have drawn upon (see Academic Honesty and Questions of Plagiarism in the Course Catalog). Ignorance and carelessness are not excuses for academic dishonesty. Because collaborative work is an integral activity in the sciences, we wish to emphasize the difference between appropriate and inappropriate cooperation. A great deal of learning results from the exchange of ideas, and we encourage such exchanges both in laboratory and outside the laboratory. All materials submitted for a grade, however, must be prepared by you alone.

Bias/Discrimination/Harassment

Kenyon College seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of sexual harassment/misconduct/assault we encourage you to report this. If you report this to a faculty member, she or he must notify our college's Title IX coordinator about the basic facts of the incident (you may choose whether you or anyone involved is identified by name). For more information about your options at Kenyon, please go to: www.kenyon.edu/directories/offices-services/title-ix/sexual-assault-and-harassment/

Disabilities

Students who anticipate they may need accommodations in this course because of the impact of a learning, physical, or psychological disability are encouraged to meet with the Director of Student Accessibility and Support Services privately early in the semester to discuss their concerns. Students must contact Erin Salva, (740-427-5453 or salvae@kenyon.edu), as soon as possible, to verify their eligibility for reasonable academic accommodations. Early contact will help to avoid unnecessary inconvenience and delays.

Students Athletes

Winter sport athletes must meet with me in the first week of classes to discuss any conflicts between the class assignments/requirements and the athletic requirements. ***Spring sport athletes*** must meet with me in the first week of practice to discuss any conflicts. This will allow us to find the best solution to any conflicts.

Student Activities in the Chemistry Department

The chemistry department sponsors seminars given by outside speakers several times a month, occasional parties, etc. These events will be announced at the beginning of the class. We would love to have you attend any or all of these events.

Changes

Any and all parts of this syllabus are subject to change. Notification of such changes will be made in class or via e-mail prior to taking effect.

Tentative Schedule of Topics

(Exam dates are fixed, however the topics and their timing is subject to change)

Week 1 & 2 –	Intro Basic Atom Anatomy; Brain Structure & Function of the CNS, *Meyer Ch 2 p. 47-end; Bear Ch 7 (Moodle)* Neuron Anatomy; *Meyer Ch 2 p. 33-4* Reward Circuit Basics Linden Reading& Questions Chemical Structure
Week 3 & 4 –	Sleep Article & Questions, *Bear Ch 19 (Moodle)* Chemical Signaling, *Meyer Ch 1* Proteins & Receptors
Week 5 –	**EXAM 1 Monday, February 12** Proteins & Receptors
Week 6 –	Polarity & Membrane and Receptors
Week 7 & 8 –	SPRING BREAK MIXED WITH THE FOLLOWING Love Article & Questions Intermolecular Forces & Membrane and Receptors Chemical Signaling by Neurotransmitters..., *Meyer Ch 3*
Week 9 & 10 –	Action Potential, *Meyer Ch 2 p.40-47, Bear Ch 4 handout* Catecholamines: special emphasis on dopamine, basal ganglia & Parkinson's *Meyer Ch 5*
Week 11-13 –	**EXAM 2 Monday, April 23** Integrated Topics, examples *(some may not be covered)* Acetylcholine & Serotonin, special emphasis: serotonin, depression & anxiety, *Meyer Ch 16 & 17* Ethyl Alcohol, *Meyer Ch 9* Nicotine & Caffeine, *Meyer Ch 12* Neurochemical Thoughts on Addiction, special emphasis: limbic reward system, nicotine, cocaine, amphetamine, *Meyer Ch 2 p58-59, Ch 11&12* Opiates & Opiate Receptors, special emphasis: heroin, morphine & exercise, *Meyer Ch 10*
Week 14 –	PROJECT PRESENTATIONS
FINAL	Wednesday, May 9 at 1:30 pm