BRAIN AND BEHAVIOR (MAP-UA.306) INFORMATION AND SYLLABUS

This MAP course satisfies the Natural Science II requirement.

LECTURE DAYS AND TIMES
11:00-12:15, Tuesdays and Wednesdays, Room 207 Silver Building.

ATTENDANCE AT LECTURES IS MANDATORY
You are responsible for the material covered in the lectures, a good proportion of which is not in the textbook.

LAB SECTIONS AND TAs (participation in laboratories is mandatory)
Room 201 Silver Building
Tuesday 3:00 - 4:40  Ashley Kopec
Tuesday 5:00 - 6:40  Ashley Kopec
Wednesday 9:00 - 10:40  Emily Cowan
Wednesday 11:00 - 12:40  Emily Cowan
Wednesday 1:00 - 2:40  Carolina Di Tella
Wednesday 3:00 - 4:40  Carolina Di Tella

The labs are designed to give you hands-on experience that is relevant to the class material. This should facilitate understanding the lecture material and provide deeper understanding of the lecture material and concepts, which can seem abstract. The labs also give you an opportunity to experience how science works, that it is a creative interpretative process that requires meticulous attention to detail as well as integrating information and observations into concepts. You will write up each lab, which documents the lab experience, record notes, and expresses ideas. Some labs will use animal tissue or living animals. **Lab reports must be handed in at the end of lecture on Thursday.**

LABS PRIOR TO EXAMS HAVE BEEN DESIGNATED AS REVIEW SESSIONS. These times have been allocated to provide you with an extra opportunity to review material and clarify understanding of the course material.

REQUIRED TEXTS
**Biological Psychology**

**MAP B&B Lab manual** (available at the bookstore)

CLASS WORK AND HOME WORK
You will be assigned readings, podcasts or movies on topics of interest from the media and there will be short quizzes on the assignments in lecture.
EXAMS
There will be three exams (2 midterm exams and a cumulative final exam). The questions will be based on material from the lectures and assigned readings. Questions will be multiple choice, fill-in the blank, short answer, simple drawing, and short essay types.

NOTE THE EXAM DATES ON THE SYLLABUS. THERE ARE NO MAKEUP EXAMS. If you miss a midterm exam, the grade on the final will count proportionately more.

GRADING
Grades will be determined according to the following breakdown:
20% Midterm Exam 1
20% Midterm Exam 2
30% Final Exam
25% Labs
5% Classwork and Homework

CONTACT INFORMATION

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SYLLABUS

Week 1
28-Jan  **Lecture 1.** Introduction: Brain and behavior an intimate couple (integrating across levels and scales of complexity)
Reading: Chapter 1

28/29-Jan  **Lab 1.** The Scientific Method

30-Jan  **Lecture 2.** Brain Organization 1: Structure and function - another intimate couple
Reading: Chapter 2 p. 34-57

Week 2
4-Feb  **Lecture 3.** Brain organization 2: billions of cool cells
Reading: Chapter 2 p. 23-33

4/5-Feb  **Lab 2.** Sheep Brain Dissection

6-Feb  **Lecture 4.** Bioelectricity: Electric meat (fat, water and salt)
Reading: Chapter 3 p. 59-63

Week 3
11-Feb  **Lecture 5:** Neural communication 1: The exciting electrical language of neurons
Reading: Chapter 3 p. 63-71

11/12-Feb  **Lab 3:** A model axon

13-Feb  **Lecture 6.** Neural communication 2: Synapses - connections and influence
Reading: Chapter 3 p. 71-89

Week 4
18-Feb  **Lecture 7.** Neural communication 3: Synapses - circuits and networking
Reading: Chapter 3

18/19-Feb  **Lab 4.** Build your own brain

20-Feb  **Lecture 8.** Neural communication 4: Exchanging drugs - there's a lot chemistry between 2 neurons
Reading: Chapter 4 p. 91-124

Week 5
25-Feb  **Lecture 9.** Neural communication 5: Hormones - action at a distance
Reading: Chapter 5

25/26-Feb  **Lab 5.** Microscopy
27-Feb  Lecture 10. Evolution: animals are models too  Reading: Chapter 6

Week 6
4-Mar  Lecture 11. Neurodevelopment or how to build something really complicated
Reading: Chapter 7

4/6-Mar  Lab: Review

6-Mar  Midterm Exam 1

Week 7
11-Mar  Lecture 12. Sensation and touching in your head
Reading: Chapter 8

11/12-Mar  Lab 6. Somatic sensation

Reading: Chapter 9 p. 256-276

Week 8
17-21 Mar  Spring Break
No lectures this week
No lab this week

Week 9
25-Mar  Lecture 14. Tasting and smelling (chemicals)
Reading: Chapter 9 p. 276-290

25/26-Mar  Lab 7. Response time

27-Mar  Lecture 15. Seeing and perceiving: how brains see 1
Reading: Chapter 10

Week 10
1-Apr  Lecture 16. Seeing and perceiving: how brains see 2
Reading: Chapter 10

1/2-Apr  Lab 8. Vision

3-Apr  Lecture 17. Moving, how complicated could it be?
Reading: Chapter 11p. 327-346
Week 11
8-Apr  Lecture 18. Motor dysfunctions
Reading: Chapter 11 p. 347-357

8/9-Apr  Lab: Review

10-Apr  Midterm Exam 2

Week 12
15-Apr  Lecture 19. Neural representation and computation
Reading: Primary literature to be provided

15/16-Apr  Lab 9: Cockroach

17-Apr  Lecture 20. Memory 1: Representing experience: Attention, ‘truthiness’ and the learning and memory process
Reading: Chapter 18 p. 561-570, 17 p. 525-541

Week 13
22-Apr  Lecture 21. Memory 2: Synaptic and molecular plasticity
Reading: Chapter 17 p. 542-559

22/23-Apr  Lab 10. Rat field behavior

24-Apr  Lecture 22. Memory 3: Persistent storage

Reading: Primary literature and NYT piece on PKMzeta to be provided

Week 14
29-Apr  Lecture 23. Reward and decision
Reading: Primary literature

29/30-Apr  Lab. Review
1-May  Lecture 24. Emotion and stress  Reading: Chapter 15

Week 15
6-May  Lecture 25. Neurogenesis: what good are new neurons?
Reading: Chapter 17 p. 554-557

6/7-May  Lab. Review/Evaluations
8-May  Lecture 26. Mental Illness and brain dysfunction
Reading: Chapter 16

Final Exam  PLACE AND TIME TO BE DETERMINED
Science is important, and everyone can do it.

Many people (e.g., university students) think they don’t like science, or that they’re not good at science, or that science is only for “geeks.” Many people also feel that science is irrelevant to their lives. Nothing could be further from the truth. In fact, people who do not “like” science “do” science all the time.

Remember when you got up this morning? You gathered and processed a large amount of information (considered whether you were hungry, thirsty, in need of caffeine; remembered what you wanted to do today; checked the time). You then calculated when you should leave your apartment in order to stop for coffee and still make it to class. Next you tested this calculation by leaving five minutes later than you should. If you had to run to make it to class, you confirmed that your original calculation was good or bad, which might affect when you leave the next time. During the process of observing, calculating, and testing, you were using scientific tools.

We constantly make decisions based on gathered information. Some decisions are simple. Others are more complicated and can dramatically affect your life, or the lives of everyone around you. For example:

Who should I vote for?
Is the globe really warming?
Is nuclear energy safe?
Am I in favor of stem cell research? Gun control? Abortion?

All these decisions require processing an ever-increasing body of information. However, most of us make them based on few, and in some cases, no facts. This needs to change.

Core science courses are designed to encourage an appreciation for science as a way of knowing. They are based on the belief that information, not rhetoric, should be the most important factor that influences our political and life decisions. They teach students to distinguish between real data and spin, strong inference and anecdote, fact and belief. As students, you will learn how we know what we know, and will be encouraged to challenge even the most entrenched dogmas. You will also be expected to participate in experiments, which are fundamental to the scientific process. No matter what career path you choose, the critical thinking skills learned from science will enrich your life.

The world of science is intriguing and beautiful.

Science stands next to the arts. At the heart of science is a quest to understand who we humans are, and how we interact with each other and the universe. What is life? Why are we here? What is the origin of the universe? Why do I look like my parents? What makes different life forms different? These questions (and thousands of others) have fascinated humans since the beginning of recorded time.

Core science courses foster a sense of wonder about the natural world. They present topics that are inherently interesting and provide students with a conceptual understanding of the ingenious technical achievements that have deepened mankind’s understanding of physics, chemistry, biology, earth science, and ourselves.
Science is a collective human endeavor.

Scientists are individuals whose creativity, passion, and charisma rival those of the most celebrated artists, writers, and political figures. Although often depicted as solitary figures working on tedious projects, each scientist is part of an evolving global network of people who push forward the boundaries of human knowledge.

By learning about scientists, one learns what makes science special. It is not that science is somehow separated from human idiosyncrasy or fallibility. Instead, what makes science special is that, despite human idiosyncrasy and fallibility, the collective human desire to understand our universe endures. Science has a universal and powerful standard for what constitutes knowledge, a standard based on independent observation and reproducibility. This stringent standard gives us confidence in our current understanding of the world and is a humbling reminder of how much remains unknown.
Academic Guidelines for Students
The College Core Curriculum, College of Arts and Science

To help foster common academic expectations among students and instructors, the following guidelines for Core courses are offered to students. While these represent minimum expectations across the curriculum, individual faculty members may set additional course requirements. Students should therefore consult the course syllabus for details of policies in each class.

Attendance
Inasmuch as students have voluntarily sought admission to the University, they are expected to attend all class meetings, including all lectures and all meetings of associated recitation, workshop, or laboratory sections. Students may be excused for documented medical or personal emergency and will receive reasonable accommodation for the observance of religious holidays. In these cases, they should contact their instructors in advance or, in cases of emergency, as soon as is practicable. Students are responsible for making up any material or assignments they miss.

Classroom Decorum
The classroom is a space for free and open inquiry and for the critical evaluation of ideas, and it should be free of personal prejudice. Students and instructors alike have an obligation to all members of the class to create an educational atmosphere of mutual trust and respect in which differences of opinion can be subjected to deliberate and reasonable examination without animus.

As a matter of courtesy to their fellow students and instructors, students should arrive at class promptly, prepared and ready to participate. Students are reminded particularly to shut off cellular telephones and, except in cases of emergency, to remain in the classroom for the duration of the lecture or section meeting. If it is necessary to leave or enter a room once class has begun, students should do so quietly and with as little disruption as possible. Under University policy, disruptive classroom behavior may be subject to faculty review and disciplinary sanction.

Note that it is within the discretion of individual faculty members to establish other classroom policies such as prohibiting use of laptop or tablet computers, e-readers, or mobile telephones.

Completion of Assignments
Students are expected to submit course work on time and to retain copies of their work until a final grade has been received for the course. Instructors are not obliged to accept late work and may assign a failing or reduced grade to such assignments.

Students who encounter sudden and incapacitating illness or an other comparably grave circumstance that prevents them from completing the final examination or assignment in a course may request a temporary mark of Incomplete from the course instructor. To receive an Incomplete, students must have completed all other requirements for the course, including satisfactory attendance, and there must be a strong likelihood they will pass the course when all work is completed.

Questions and Concerns
Up-to-date course information is available on the Core Curriculum website: http://core.cas.nyu.edu. Questions, concerns, comments, and feedback may be directed to the following members of the Core Curriculum staff, located in 903 Silver Center, 212-998-8119. Complaints will remain confidential.

Director
Associate Director, FSI
Associate Director, FCC
Department Administrator

Prof. Malcolm Semple
Prof. Trace Jordan
Prof. Vincent Renzi
Mr. Daniel Holub

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As a student at New York University, you have been admitted to a community of scholars who value free and open inquiry. Our work depends on honest assessment of ideas and their sources; and we expect you, as a member of our community, likewise to maintain the highest integrity in your academic work. Because of the central importance of these values to our intellectual life together, those who fail to maintain them will be subject to severe sanction, which may include dismissal from the University.

Plagiarism consists in presenting ideas and words without acknowledging their source and is an offense against academic integrity. Any of the following acts constitutes a crime of plagiarism.

Using a phrase, sentence, or passage from another person’s work without quotation marks and attribution of the source.
Paraphrasing words or ideas from another’s work without attribution.
Reporting as your own research or knowledge any data or facts gathered or reported by another person.
Submitting in your own name papers or reports completed by another.
Submitting your own original work toward requirements in more than one class without the prior permission of the instructors.

Other offenses against academic integrity include the following.

Collaborating with other students on assignments without the express permission of the instructor.
Giving your work to another student to submit as his or her own.
Copying answers from other students during examinations.
Using notes or other sources to answer exam questions without the instructor’s permission.
Secreting or destroying library or reference materials.
Submitting as your own work a paper or results of research that you have purchased from a commercial firm or another person.

*Particular emphasis is placed on the use of papers and other materials to be found on the World Wide Web, whether purchased or freely available. In addition to having access to the same search engines as students, faculty also have at their disposal a number of special websites devoted to detecting plagiarism from the web.*

Plagiarism and other cases of academic fraud are matters of fact, not intention. It is therefore crucial that you be diligent in assuring the integrity of your work.

Use quotation marks to set off words that are not your own.
Learn to use proper forms of attribution for source materials.
Do your own original work in each class, without collaboration, unless otherwise instructed.
Don’t use published sources, the work of others, or material from the web without attribution.
For further information, consult the College of Arts and Science website on academic integrity at http://cas.nyu.edu/page/academicintegrity.
Grading Guidelines  
The College Core Curriculum, College of Arts and Science

The College Core Curriculum is designed to provide students with an intellectually rigorous general education in the liberal arts. Because Core courses seek to stretch you beyond your previous schooling and major course of study, they will likely be among the most academically challenging experiences you undertake as an undergraduate. The following guidelines outline our common expectations concerning the evaluation of students’ work across the curriculum.

The grade of A marks extraordinary academic performance in all aspects of a course and is reserved for clearly superior work. In large lecture courses such as those in the Core, it would be unusual for more than 20–25% of students to earn grades in this range, or for more than 10% to merit marks of straight A.

As a faculty, we are similarly concerned to reserve the mark of B+ to signify very good work.

It is our hope and desire that the majority of students will want and be able to do good work in their Core courses, work in the B range. Because these courses are intended by design to foster your intellectual development, the difference between merely satisfactory and good work will frequently depend on outstanding effort and class participation. For this reason, class participation is typically a substantial component of the overall grade in Core courses.

The grade of C denotes satisfactory work—regular attendance, ordinary effort, a minimum of demonstrated improvement across the semester. It is expected that every student is capable of and motivated to perform at least at this level.

Grades below C are reserved for less than satisfactory and, in the D range, for poor work and effort, and mark a need for improvement.

The grade of F indicates failure to complete the requirements for a course in a creditable manner. It marks a judgment about the quality and quantity of a student’s work and participation—not about the student—and is therefore in order whenever a student fails to complete course requirements, whatever his or her intentions or circumstances may be.

The temporary mark of I (Incomplete) is given only when sudden and incapacitating illness, or other grave emergency, prevents a student from completing the final assignment or examination for a course. It must be requested by the student in advance; all other course requirements, including satisfactory attendance, must have been fulfilled; and there must be a reasonable expectation that the student will receive a passing grade when the delayed work is completed. Students must make arrangements with the faculty member to finish the incomplete work as soon as circumstances permit within the following semester. If not completed, marks of I will lapse to F.