# http://i.dailymail.co.uk/i/pix/2010/01/04/article-0-07BFD0B0000005DC-142_468x327.jpg

PSYC 251A: Introduction to Biopsychology

Spring 2016

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| **Instructor:**  | Matthew McMurray, PhD Assistant ProfessorDepartment of Psychology Office: Psychology, Room 221 E-mail: matthew.mcmurray@miamioh.edu | **Undergraduate Teaching Fellow:** | Kelsey StraubPsychology MajorClass of 2016Email: straubkt@miamioh.edu |
| **Graduate Assistant:** | Gaojie FanGraduate StudentDepartment of PsychologyOffice: Psychology, Room 224Email: fang@miamioh.edu |  |  |

# **Class Meeting Location and Times**

Times: MWF 11:30am - 12:25pm

Location: 131 Psychology Building

# **Instructor Office Hours**

Times: Thursdays 3-5pm or by appointment

Location: Dr McMurray’s office is located on the second floor of the Psychology Building, Room 221. He maintains an active research laboratory. Therefore, on occasion, his office hours will be held in the Behavioral Neuroscience laboratories (basement of Psychology Building). He will send an email and leave a note on his office door in that case.

Note: Dr McMurray strongly encourages each of you to stop by early and often. Not only will this help you better understand this difficult material, but it also lets him get to know you and get feedback on the course during the semester. This is a very large class, so forming a productive relationship with each of you will be challenging. However, he would ideally like to get to know each of you! Please help this happen by coming to his office hours at least once during the semester.

# **Graduate Assistant Office Hours**

Times: Mondays 8-10am or by appointment

Location: Gaojie’s office is on the second floor of the Psychology building, Room 224, just down the hall from my own.

Note: Gaojie should be your first contact point if you have questions or concerns. If she is unable to satisfactorily answer your question, then please do not hesitate to come see Dr McMurray during office hours (or by appointment).

# **Distinguished Undergraduate Teaching Fellow (DUGTF)**

The Department of Psychology sponsors this program for the most talented and advanced psychology majors. The responsibilities of DUGTFs include assisting faculty in various aspects of undergraduate education, including tutoring, checking homework assignments, assisting with in-class activities, etc. DUGTF’s receive independent study credit and may receive financial compensation. More importantly, students will be officially recognized for having been chosen for this honor, and thus can list participation in the program on job or graduate school applications. DUGTF’s are sponsored by a faculty member (in this case, Dr McMurray). Our DUGTF, Kelsey Straub, will be present at our class meetings and will assist with a number of in class activities throughout the semester. Kelsey does not have regular office hours (since she has no office); however, she will be hosting review sessions throughout the semester to help facilitate your success in the course. Additionally, if you need extra help with any course content, DR MCMURRAY strongly encourage you to contact her for tutoring or one-on-one review. Please remember that she is volunteering her time to assist you, so please be respectful in your interactions with her and appreciative of her time. If you are interested in becoming a DUGTF in future semesters, talk with Dr McMurray for more information about this opportunity!

# **Course Description**

Behavioral Neuroscience (aka biopsychology) represents the merging of Psychology and Biology. At its core, Behavioral Neuroscience seeks to explain complex behaviors by the physiological processes that underlie them. During the semester you will learn about how behavior is generated in response to events in the world around us. You will gain a significant understanding of the nervous system, how it is organized and how it works. We will cover how our bodies are built to receive information from the senses and turn that information into plans to move our bodies to react to those sensations. We will also cover how the endocrine system, which releases hormones, interacts with the nervous system and influences behavior. Finally, we will consider a biological basis for higher order function (e.g. learning and memory) as well as psychological disorders such as schizophrenia and drug addiction. One way of viewing the importance of this course is by considering it among all the other sciences, as illustrated below (adapted from xkcd):



# **Learning Outcomes**

1. Describe the locations and major functions of discrete brain regions and parts of the neuron.
2. Demonstrate how neurons communicate using chemical and electrical signals.
3. Diagram the neural circuits involved in the 5 major senses, and apply this knowledge to your events occurring in your everyday life.
4. Compare and contrast the roles of various hormonal systems in the regulation of anxiety, sleep, feeding, sexual, and aggressive behaviors.
5. Identify the biological bases of learning and memory, language and higher order cognitive functions, including neuroanatomical, neurochemical, hormonal, and evolutionary explanations.
6. Describe the biological bases of psychological disorders, in particular mood disorders, addiction, and traumatic brain injury. The biological bases can include neuroanatomical, neurochemical, and genetic explanations.
7. Relate the field of neuroscience to your own academic or career goals.

# **http://www-fp.pearsonhighered.com/assets/hip/images/bigcovers/0205994709.jpgRequired Text**

Pinel, JP (2013) Biopsychology, 9th Edition. Upper Saddle River, NJ: Pearson Education, Inc.

* While older additions will likely contain much of the required material, there are significant differences. The instructors will be teaching material from this edition, and we strongly suggest students use it instead of older editions.
* MyPsychLab is an optional online resource that provides videos on psychological research and applications, allows you to participate in virtual experiments, and develop critical thinking skills through writing. This resource is optional, but may help cement course material, and so it’s worthy of your consideration.
* King library has a copy of the book on reserve.
* Throughout the semester, the instructors will be highlighting other reading material that will supplement the course content. These materials are more popular in nature (not textbooks). These readings are not required, but if a topic we discuss in class interests you, they are excellent resources to expand upon what you learn in class.

# **Evaluation**

Homework (5pts each; 175pts total): Throughout the semester we will be relying on images to learn challenging concepts (an image is worth a thousand words!). Understanding and remembering these images is of paramount importance, as they summarize a tremendous amount of material into a simple, digestible form. Therefore, after select class meetings (dates marked on the calendar below) you will draw a figure from the prior class that you felt to be the most interesting/important from that class. There are no right or wrong answers, but depth/completeness will be assessed to determine your grade. These homework assignments can be drawn by hand or digitally, but should not be copied from the text or other online materials. If drawn by hand, take a picture of the drawing or scan the drawing using scanners available in the library. Submit these drawings via canvas before the start of the next class period. No late assignments will be accepted.

Quizzes (10pts each; 175pts total): Before the start of each Chapter’s discussion, a ten question quiz will be posted on Canvas. These quizzes will be due by 9PM on the day prior to that Chapter’s discussion, and will address content from the Chapter to be discussed. These quizzes can be completed using any material available to you (the book, Google, etc), but can only be taken once. Additionally, once begun, each quiz must be completed in 30 minutes, and questions cannot be returned to once they are completed. Lastly, one additional quiz on the syllabus (worth 15 points) must be completed during the first week of class. This quiz can be repeated until a perfect score is obtained.

Paper (50pts each; 100pts total): Two 2 page papers will be due during the course (one in the third block and one in the fourth). In the first of these papers, “A Day in the Life”, you will follow two different sensory experiences, from the sensory receptor all the way through to the cognitive processes that are required to perceive it. This paper will be due during the third block. In the second of these papers, “Neuroscience and Me”, you will describe how the content we have discussed in class will be applicable to your current career goals. This paper will be due during the fourth block. Prompts for each paper will be posted on Canvas, and discussed in class. All papers should be submitted on Canvas.

Exams (100pts each; 500pts total): There will be 4 semester exams, one for each block of the course (see course calendar below), and one cumulative final exam. All exams will be completed online on Canvas, and must be completed during the 5 day window in which they are available. Once started, you will have 55 minutes to complete the exam, and once answered, you cannot return to a question. All exams are closed-book and closed-note. Please adhere to Miami’s policies on Academic Misconduct (see below). If misconduct is suspected by a single student, all remaining exams will be rescheduled for in-class. Since exams are taken online and a multiple day window is available for each exam, **no makeup exams will be given for any reason** (including athletic). You MUST take all exams during the window in which they are scheduled. If you miss an exam, you will receive a score of zero for that exam. If class is cancelled by the University for any reason during the exam window (eg. inclement weather), the exam will still be held at the scheduled window (since it is taken online). Please make sure your computer is functioning properly prior to beginning the exam, or consider taking it at a library where support is immediately available should a problem arise.

Final Grades: The scores of all score-able course materials will be summed, and then this score will then be divided by the total number of points possible for the semester (950) to generate your final grade. Final grades will be earned according to the following scale:

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| --- | --- | --- | --- |
| ***Total % Grade***100% A+93 – 99% A90 – 92%       A- | ***Total % Grade***87 – 89%       B+83 – 86%        B 80 – 82%       B- | ***Total % Grade***77 – 79%       C+73 – 76%        C70 – 72%        C- | ***Total % Grade***67 – 69%        D+63 – 66%         D60 – 62%        D-<59%       F |

# **Academic Dishonesty**

Academic Integrity is at the heart of the mission and values of Miami University and is an expectation of all students. As the [Code of Love and Honor](http://www.miamioh.edu/iammiami) states, “We stand for honesty, integrity, and the importance of moral conduct.” This is an expectation for all Miami community members. Maintaining academic integrity is a reflection of your character and a means to ensuring that you are achieving the outcomes of this course and that your grades accurately reflect your learning and understanding of the course material.

Both Miami University and the Psychology department are dedicated to providing a learning environment based not only upon academic excellence, but academic integrity as well. In this course it is expected that you will adhere to all Miami University guidelines regarding academic misconduct. For more information about academic integrity, please review the [Academic Integrity Information Guide](http://miamioh.edu/integrity/student-resources/) and the [Policy](http://blogs.miamioh.edu/miamipolicies/?p=1994).

Academic dishonesty is defined as any activity that compromises the academic integrity of the institution or subverts the educational process. Examples of academic dishonesty include, but are not limited to:

1. Cheating: using or attempting to use or possessing any aid, information, resources, or means in the completion of an academic assignment that are not explicitly permitted by the instructor or providing such assistance to another student.
2. Plagiarism: presenting as one’s own work ideas, representations, or words of another person/source without proper attribution.
3. Fabrication: falsification, invention, or manipulation of any information, citation, data, or method.
4. Unauthorized collaboration: working with another individual or individuals in any phase of or in the completion of an individual academic assignment without explicit permission from the instructor to complete the work in such a manner.
5. Misrepresentation: falsely representing oneself or one’s efforts or abilities in an academic assignment.
6. Gaining an unfair advantage: completing an academic assignment through use of information or means not available to other students or engaging in any activity that interferes with another student’s ability to complete his or her academic work.

Attempts to engage in any of the above actions will be treated the same as completed acts. Any suspected instances of academic dishonesty will be handled under Miami University’s Academic Integrity policy found in [Part 1, Chapter 5 of the Student Handbook](http://blogs.miamioh.edu/miamipolicies/?p=1994). Please review this policy, and note that lack of knowledge or understanding of the appropriate academic conduct is not an excuse for committing academic dishonesty. Students who are found responsible for committing academic dishonesty will receive a sanction that ranges from a zero on the assignment to an F in the course, which could also include the AD transcript notation. Students who commit academic dishonesty twice will automatically be suspended from Miami. If you have questions about how to complete an assignment or what could constitute academic dishonesty for a particular assignment, please feel free to visit Dr McMurray during office hours. Dr McMurray also encourages you to meet with him if you suspect that another student in the course has engaged in academic misconduct.

# **Attendance Policy**

To succeed in this class (and all instructors genuinely want all of you to succeed), you should plan to attend the lectures and read the assigned material. You will be tested on both lecture material and information from the textbook. Lectures will not simply be a regurgitation of what is in the textbook, and will instead only highlight some of the information covered in the text while going into greater detail on other topics. If you must miss class for any reason, it is your responsibility to find out what you missed from a classmate. The instructor will not review the material that you missed in class. Additionally, you are responsible for all announcements made during lecture, whether you are present or not (e.g. changes to syllabus, exam dates, or assignments). There will be NO MAKE-UPS FOR IN-CLASS ASSIGNMENTS. If you miss the class for any reason, you will be assigned a zero for any missed assignments. Lastly, all students must attend the first two meetings of the course, or they will be automatically dropped from the course. If you do not want to be dropped, but cannot attend the first two meetings, please email Dr McMurray to see if an accommodation can be made. If you are not yet enrolled in the course, come see Dr McMurray as soon as the semester begins. Dr McMurray will start a wait-list (first come first serve) to fill any open seats after the second class meeting.

# **Students with Disabilities**

Miami University is committed to maintaining a barrier-free environment so that individuals with disabilities can fully access programs, courses, services, and activities. Students with disabilities who require accommodations for full access and participation in the course must be registered with Student Disability Services. Accommodations are available for students who have disabilities; however, accommodations can only be granted if requested through Student Disability Services (SDS). If you choose to disclose your disability to Dr McMurray to receive accommodations, SDS will provide you with a letter to present to Dr McMurray. This letter will confirm that you are registered with SDS and will list reasonable accommodations recommended by SDS. You should plan to meet with Dr McMurray during office hours ASAP to discuss the accommodations and make sure a plan is in place. Please notify Dr McMurray during the first week of class if you need any accommodation for the course, or immediately after a diagnosis has been made during the semester, so that the expectations for all parties are clear. It is YOUR responsibility to initiate this process.

# **Other Important Notes**

Dr McMurray will make every effort to post the lecture notes on Canvas prior to each class meeting. However, he cannot guarantee they will be posted in time for you to print them out ahead of time. Additionally, the instructors reserve the right to make changes to the slides at any time, including after the content has been discussed in class. This allows for the slides to be updated based on the amount of material covered, and helps the instructors remember the topics you have struggled with, so they know how better to present them in future semesters. Therefore, when studying, you are encouraged to use the most up to date versions of each set of notes. When new versions are posted, an announcement will be made on Canvas.

Cell phone use during class is prohibited. Students may be asked to leave if disruptions persist. Please put your phones into airplane mode before entering the classroom.

Communicating professionally (via email or otherwise) is one of the most important skills to develop in modern society. The instructors expect you to use the same respect in email or online that you would in the classroom (e.g., addressing emails to Dr. McMurray or Professor McMurray, saying “please” and “thank you”, etc). We also expect that you will consult this syllabus and the Canvas site for announcements *before*emailing any instructors. Canvas will be used to make important announcements about the course. You should therefore check this important communication channel at least daily. If you decide to email an instructor, and your email is justified, we will do our best to respond quickly (usually by the end of the next business day); however, because our ability to answer complex questions via email isn’t perfect, don’t be alarmed if we suggest that you ask a question in class or in office hours. Additionally, we may suggest this if we get the same question from multiple students. Instructors will not respond to email received after 9pm until the following morning, and longer delays may occur on weekends.

# **Course Schedule/Reading Assignments (subject to change):**

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| **Week** | **Date** | **Topic** | **Reading Due Before Class** |
| **FOUNDATIONS OF BIOPSYCHOLOGY** | 1 | 25 Jan | Introduction | Chapter 1 |
|  | 27 Jan | Neuroanatomy I | Chapter 3\* |
|  | 29 Jan | Neuroanatomy II # | Chapter 3 |
| 2 | 1 Feb | The Neuron # | Chapter 3 |
|  | 3 Feb | Resting Membrane Potential # | Chapter 4\* |
|  | 5 Feb | Synaptic Potentials # | Chapter 4 |
| 3 | 8 Feb | Action Potentials # | Chapter 4 |
|  | 10 Feb | Neurotransmitters and Receptors # | Chapter 4 |
|  | 12 Feb | Pharmacology # | Chapter 4 |
| 4 | 15 Feb | Neural Development # | Chapter 9\* |
|  | 17 Feb | Nature (Genes) vs Nurture (Environment) # | Chapter 2\* |
|  | 19 Feb | Foundations Group Activity # | -- |
|  | 19-23 Feb | **Exam 1 Available on Canvas** |  |
| **SENSING AND DOING** | 5 | 22 Feb | Sensory Systems Overview | -- |
|  | 24 Feb | Visual System I | Chapter 6\* |
|   | 26 Feb | Visual System II # | Chapter 6 |
| 6 | 29 Feb | Visual System III # | Chapter 6 |
|  | 2 Mar | Auditory System I # | Chapter 7\* |
|  | 4 Mar | Auditory System II # | Chapter 7 |
| 7 | 7 Mar | Gustatory and Olfactory Systems # | Chapter 7 |
|  | 9 Mar | Somatosensory System I # | Chapter 7 |
|  | 11 Mar | Motor Systems I # | Chapter 8\* |
| 8 | 14 Mar | Sensing and Doing Group Activity | -- |
|  | 16 Mar | Illusions and Sensory Tricks # | --  |
|  | 16-20 Mar | **Exam 2 Available on Canvas** |  |
| **HORMONES AND HOMEOSTASIS** |  | 18 Mar | Neuroendocrine System Overview | -- |
| 9 | 21 Mar | NO CLASS (SPRING BREAK) | HAVE FUN!! |
|  | 23 Mar | NO CLASS (SPRING BREAK) | HAVE FUN!! |
|  | 25 Mar | NO CLASS (SPRING BREAK) | HAVE FUN!! |
| 10 | 28 Mar | Sexual Development | Chapter 13\* |
|  | 30 Mar | Sexual Orientation and Behavior # | Chapter 13 |
|  | 1 Apr | Sleep #**Paper 1 Due by midnight** | Chapter 14\* |
| 11 | 4 Apr | Emotion and Stress I | Chapter 17\* |
|  | 6 Apr | Emotion and Stress II | Chapter 17\* |
|   | 8 Apr | Hunger # | Chapter 12\* |
|  | 8-12 Apr | **Exam 3 Available on Canvas** | -- |
| **HIGHER ORDER FUNCTIONAND DYSFUNCTION** | 12 | 11 Apr | Learning and Memory I # | Chapter 11\* |
|  | 13 Apr | Learning and Memory II # | Chapter 11 |
|  | 15 Apr | Language and Lateralization # | Chapter 16\* |
| 13 | 18 Apr | Reward and Motivation # | Chapter 15\* |
|  | 20 Apr | Drug Abuse and Addiction I # | Chapter 15 |
|  | 22 Apr | Drug Abuse and Addiction II # | Chapter 15 |
| 14 | 25 Apr | Depression # | Chapter 18\* |
|  | 27 Apr | Anxiety # | Chapter 18 |
|  | 27-30 Apr | **Exam 4 Available on Canvas** | -- |
|  | 29 Apr | Brain Injury # | Chapter 10\* |
| 15 | 2 May | Neuroanatomy Lab | -- |
|   | 4 May | Parkinson’s Disease # | Chapter 10 |
|  | 6 May | Alzheimer’s Disease**Paper #2 Due by midnight** | Chapter 10 |
|   |   | 7-11 May | **Final Comprehensive Exam Online** |   |

# Homework assignment due by class start

\* Chapter quiz due by 9pm the night prior