Course Syllabus

Course Number: Biological Basis of Behavior 18:820:622:B1 #00179 Summer 2020

Course meeting times and location: Monday and Friday, 9am to 1pm, web-based (Canvas)
Begin Date 05/22/2020
End Date (Final Exam) 06/26/2020

Faculty Name: Tatiana Schniedner, PhD

Office hours: Appointments available upon request (Zoom, Skype, Webex)
Email address: ts964@rutgers.edu; tatiana.p.schniedner@gmail.com;

Course Description

Course Overview:
This three-credit course will provide you with an understanding of biopsychology. Biopsychology is the science of the biological bases of human behavior, the field that concerns itself with linking function with brain structure. This science is also sometimes referred to as “functional neuroanatomy” or “behavioral neuroanatomy”. It is impossible to understand human behavior without some level of understanding of the physical structure of the brain, the organ that enables behavior. While a sense of the molar (general or large-scale) structure is essential for a basic recognition of the master organ of the body, an appreciation of the molecular (denser, inner-intricacies) provides a foundation and insight to the complex nuances of human behavior.

PROFESSION-WIDE COMPETENCIES & DISCIPLINE-SPECIFIC KNOWLEDGE:

School Psychology Profession-Wide Competency (SP-PWC) Elements

5.2: Demonstrates skills in producing, comprehending, and integrating oral, nonverbal, and written communications that are informative and well-integrated across a range of situations, populations, and systems.

Discipline-Specific Knowledge (DSK)
Biological Aspects of Behavior, including multiple biological underpinnings of behavior, such as neural, physiological, anatomical, and genetic aspects of behavior. Although neuropsychological assessment and psychopharmacology can be included in this category, they do not, by themselves, fulfill this category.

At the end of this course, you should:

- Have an overview of the working brain and a general theoretical understanding of how the brain is related to human behavior
- Have a specific understanding of the way in which many particular aspects of cognitive and personality functioning relate to brain structures, neurochemistry and hormonal responses.
- Conceptualize how the science can be applied to actual clinical practice and to your own capacity to consider and understand human behavior
• Be able to consider issues relating to diversity and individual differences as they related to brain structure and functioning
• Understand the biological concepts responsible for behavioral output

<table>
<thead>
<tr>
<th>Biological concepts</th>
<th>Behavioral output</th>
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<tbody>
<tr>
<td>Cellular organization</td>
<td>Arousal</td>
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<tr>
<td>Cellular communication (neurochemical &amp; electrical)</td>
<td>Attention</td>
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<tr>
<td>Major anatomical structures</td>
<td>Sense Organs and Special Senses</td>
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<td>Brain networks</td>
<td>Higher Cortical Function</td>
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<td>Hormones and the Endocrine System</td>
<td>Emotions/Drive State</td>
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<td>Central and Peripheral Nervous System</td>
<td>Pain perception/Addiction</td>
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<td>The Immune System</td>
<td>Stress/sickness</td>
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<td>Genetics, adaptation and degeneration</td>
<td>Development/death</td>
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Course Texts and Materials
Required Texts:


Optional Texts (not required for class, but will support learning):


Supplemental material:

1. Recommended papers: will be provided on an ongoing basis, as applicable, and available via LMS
2. Tutorial videos: links will be provided, as applicable, and available via Canvas

Course Requirements: Grading will consist of two examinations and 1 paper.

The examinations will each account for 35% of the final course grade (total of 70%). Examinations will include both short answer and multiple-choice elements. Second examination will not be cumulative and will only cover material presented after examination one.

The paper accounts for 20%. For the paper you will have to choose a character from a novel (fictional or non-fictional), film (fiction or non-fiction, documentary). This person should have a diagnosable psychiatric disease, personality disorder, or any other condition that we cover in this class (refer to the Syllabus below). This paper should describe the behavior of the individual, focusing on the most relevant and telling and revealing examples of the disease (2 pages), followed by a detailed description of possible biological roots of the cognitive and behavioral maladaptation (3-4 pages). Paper should be font 11, Arial, double-spaced, 1-inch margins on each side and submitted in Word. You are encouraged to share with me a draft, should there be any questions or concerns regarding the direction of the narrative. Essentially, this has to be a case study where you apply your new knowledge and make educated “guesses” regarding the condition. Papers are due on June 22 at 9 am. No papers will be accepted after 5:00pm on the final day of class unless prearranged with the instructor.

The remaining 10% of the grade will come from in and out of class participation.
COURSE SCHEDULE: CALENDAR, TOPICS, READING LIST

**Week 1: May 22, 2020**

**Topic 1:** Introduction to Biological Basis and review of syllabus / History of Neurobiology: We will discuss the origin and ethics of the study of brain and behavior taking a historical perspective to current trends.

**Readings:** Getz Chapter 1

**Add. Res:** Videos and additional readings on Canvas

**Topic 2:** Clinical Methods and Introduction to Neuropsychology: We will discuss the available technology for understanding the brain beyond clinical observation. This will include reviewing EEG, MRI, Neuropsychological Testing, etc.

**Readings:** Getz Chapter 2

**Add. Res:** Videos and additional readings on Canvas

**Week 2: May 25, 2020 – No Class Memorial Day Holiday**

**May 29, 2020**

**Topic 3:** Structure of the Nervous System: We will discuss brain development from the cellular level to brain maturity. We will look at cellular structures and divisions of the nervous system. We will also discuss neurotransmitters (intro to psychopharmacology) and implications for psychiatric disorders.

**Readings:** Getz Chapter 3

**Add. Res:** Videos and additional readings on Canvas

**Topic 4:** Major Neuroanatomical Structures: We will discuss in detail major neuroanatomical structures and their role in behavioral regulation. We will also introduce hormone regulation.

**Readings:** Getz Chapter 4

**Add. Res:** Videos and additional readings on Canvas

**Week 3:**

**June 1, 2020**

**Topic 5:** Psychopharmacology and Childhood Disorders: We will discuss disorders of childhood and their diagnosis and treatment including implication for psychotropic medication.

**Readings:** Getz Chapter 5

**Add. Res:** Videos and additional readings on Canvas

**Topic 6:** Schizophrenia: We will discuss the proposed neuroanatomical basis, neurochemistry and pharmacology of schizophrenia.

**Readings:** Getz Chapter 6

**Add. Res:** Videos and additional readings on Canvas

**June 5, 2020**

**EXAMINATION I (9am – 11am)**

**Topic 7:** Mood Disorders: We will discuss the proposed neuroanatomical basis, neurochemistry and pharmacology of mood disorders.

**Readings:** Getz Chapter 7

**Add. Res:** Videos and additional readings on Canvas

**Week 4:**

**June 8, 2020**

**Topic 8:** Anxiety Disorders: We will discuss the fight-or-flight response and the role of stress hormones on behavior. We will explore the proposed neuroanatomical basis, neurochemistry and pharmacology of anxiety disorders.

**Readings:** Getz Chapter 8

**Add. Res:** Videos and additional readings on Canvas

**Topic 9:** Eating Disorders: We will explore the neurobiology of eating disorders with a particular focus on behavioral control and the brains reward system.
Readings: Getz Chapter 9  
Add. Res: Videos and additional readings on Canvas

**June 12, 2020**  
**Topic 10:** Sleep disorders: We will explore the sleep/wake cycle and explore proposed neuroanatomical basis, neurochemistry and pharmacology of disordered sleep. We will also discuss sleep apnea and the broader implication of hypoxic brain injury on behavior.  
**Readings:** Getz Chapter 10  
**Add. Res:** Videos and additional readings on Canvas

**Week 5:**

**June 15, 2020**  
**Topic 11:** Substance Abuse Disorders: We will explore the neurobiology of substance abuse disorders with a particular focus on behavioral control and the brain's reward system.  
**Readings:** Getz Chapter 11  
**Add. Res:** Videos and additional readings on Canvas

**June 19, 2020**  
**Topic 13:** Traumatic Brain Injury: We will discuss in depth traumatic brain injury including sports concussion. We will also discuss current controversies such as chronic traumatic encephalopathy (CTE). We will discuss cognitive rehabilitation.  
**Readings:** Getz Chapter 13  
**Add. Res:** Videos and additional readings on Canvas  
**Topic 12:** Medical Disorders: We will discuss common neurological and medical conditions that can impact behavior. Examples include dementias, epilepsy, movement disorders, cancer, etc.  
**Readings:** Getz Chapter 12  
**Add. Res:** Videos and additional readings on Canvas

**Week 6:**

**June 22, 2020**  
**Topic 14:** Personality disorders: We will explore the proposed neuroanatomical basis of personality development as well as changes caused by acquired neurological injury.  
**Readings:** Getz Chapter 14  
**Add. Res:** Videos and additional readings on Canvas

**June 26, 2020**  
**FINAL EXAMINATION (9am – 11am)**  
**Topic 15:** Special topics and wrap-up.  
**Readings:** no chapters  
**Add. Res:** Video and additional readings

**UNIVERSITY POLICIES**

**Attendance:**

Every student is expected to participate in each of his/her courses through regular attendance at lecture sessions. It is further expected that every student will be present, on time, and prepared to participate when scheduled class sessions begin. Attendance will not be a component of course grading.

Students are expected to attend class and complete assignments as scheduled, to avoid outside conflicts (if possible), and to enroll only in those classes that they can expect to attend on a regular basis. Absences from class are handled between students and instructors. The instructor may require documentation to substantiate the reason for the absence. The instructor should provide make-up opportunities for student absences caused by illness, injury,
death in the family, observance of religious holidays, and similarly compelling personal reasons including physical
disabilities. For lengthy absences, make-up opportunities might not be feasible and are at the discretion of the
instructor.

**Academic Integrity Policy:**

Academic dishonesty is any attempt by the student to gain academic advantage through dishonest means, to
submit, as his/her own work that which has not been done by him/her or to give improper aid to another student in
the completion of an assignment. Such dishonesty would include, but is not limited to: submitting as his/her own a
project, paper, report, test, or speech copied from, partially copied, or paraphrased from the work of another
(whether the source is printed, under copyright, or in manuscript form). Credit must be given for words quoted or
paraphrased. The rules apply to any academic dishonesty, whether the work is graded or ungraded, group or
individual, written or oral.

**Americans with Disabilities Act (ADA) Policy:**

Any student who has a documented disability and is in need of academic accommodations should notify the
professor of this course and contact the Office of Differing Abilities Services. Accommodations are individualized
and in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of