

Syllabus

Course Overview

In this course, learners explore the mind-body connection and the biological bases of behavior. Learners study the structure and functions of the nervous system; brain evolution and plasticity; theories and methods of physiological psychology; and the neurological bases of sensation, perception, motivation, emotion, and higher cortical functions as well as the application of these issues to our professional, social, and daily life.

Course Competencies

(Read Only)

To successfully complete this course, you will be expected to:

- 1 Analyzes research methods used in the study of biological psychology.
- 2 Apply psychological theories to topics in biological psychology.
- 3 Apply scholarly research findings to topics in biological psychology.
- 4 Apply theory and scholarly research findings to inform professional and personal ethics, values and behavior.
- 5 Communicate in a manner that is scholarly, professional, and consistent with expectations for professionals in the field of psychology.

Course Prerequisites

Prerequisite(s): BIO1000, PSYC1000, or PSYC1001.

Syllabus >> Course Materials

Required

The materials listed below are required to complete the learning activities in this course.

Integrated Materials

Many of your required books are available via the VitalSource Bookshelf link in the courseroom, located in your Course Tools. Registered learners in a Resource Kit program can access these materials using the courseroom link on the Friday before the course start date. Some materials are available only in hard-copy format or by using an access code. For these materials, you will receive an email with further instructions for access. Visit the [Course Materials](#) page on Campus for more information.

Miscellaneous Item

Companion Website

Garrett, B., & Hough, G. (2018). *Brain & behavior: An introduction to behavioral neuroscience* (5th ed.). [Companion Website]. Retrieved from <https://edge.sagepub.com/garrett5e>

Book

Garrett, B., & Hough, G. (2018). *Brain & behavior: An introduction to behavioral neuroscience* (5th ed.). Thousand Oaks, CA: Sage. ISBN: 9781506349206.

Library

The following required readings are provided in the Capella University Library or linked directly in this course. To find specific readings by journal or book title, use [Journal and Book Locator](#). Refer to the [Journal and Book Locator library guide](#) to learn how to use this tool.

- Koch, C., & Greenfield, S. (2007). [How does consciousness happen?](#) *Scientific American*, 297(4), 76–83.
- *The Addiction Letter*. null

External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL. Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- Sage Publications. (2015). [Associative long-term potentiation \[Animation\]](#). | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/12.11.swf>
- Sage Publications. (2015). [Brain mechanisms of sleep and arousal \[Animation\]](#). | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/15.10.swf>
- Sage Publications. (2015). [Glutamate's role in long-term potentiation \[Animation\]](#). | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/12.12.swf>
- Sage Publications. (2015). [Hunger, satiation, and the regulation of fat reserves \[Animation\]](#). | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/6.8.swf>
- Sage Publications. (2015). [Place analysis of auditory frequency \[Animation\]](#). | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/9.10.swf>
- Sage Publications. (2015). [Sound localization \[Animation\]](#). | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/9.19.swf>
- Sage Publications. (2015). [The neural impulse \[Animation\]](#). | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/2.8.swf>
- Sage Publications. (2015). [The spinal cord \[Animation\]](#). | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/3.17.swf>

- Sage Publications. (2015). *The Wernicke-Geschwind model of language* [Animation]. | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/9.21.swf>
- Sage Publications. (2015). *Transmission at the Synapse* [Animation]. | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/2.14.swf>
- Sage Publications. (2015). *Visual detection of edges* [Animation]. | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/10.21.swf>
- Sage Publications. (2015). *Visual projections to the cortex* [Animation]. | [Transcript](#) Retrieved from <http://www.sagepub.com/garrett3e/study/resources/Animations/10.4.swf>

Suggested

The following materials are recommended to provide you with a better understanding of the topics in this course. These materials are not required to complete the course, but they are aligned to course activities and assessments and are highly recommended for your use.

Optional

The following optional materials are offered to provide you with a better understanding of the topics in this course. These materials are not required to complete the course.

Integrated Materials

Book

Newman, S. D., & Just, M. A. (2005). *The neural bases of intelligence: A perspective based on functional neuroimaging*. In R. J. Sternberg & J. E. Pretz (Eds.), *Cognition & intelligence: Identifying the mechanisms of the mind* (pp. 88–103). New York, NY: Cambridge University Press.

Wallace, S. A. (Ed.). (1989). *Perspectives on the coordination of movement* (Vol. 61). New York, NY: North-Holland.

Library

The following optional readings may be available in the Capella University Library. To find specific readings by journal or book title, use [Journal and Book Locator](#). Refer to the [Journal and Book Locator library guide](#) to learn how to use this tool. If the full text is not available, you may be able to request a copy through the [Interlibrary Loan](#) service.

- *Addictive Behaviors*. null
- *American Journal of Psychotherapy*. null
- *American Journal of Speech-Language Pathology*. null
- *American Journal on Intellectual and Developmental Disabilities*. null
- *Annual Review of Neuroscience*. null
- *Behavioral and Brain Functions*. null
- *Behavioral Neuroscience*. null
- *Biological Psychology*. null
- *BMC Neuroscience*. null
- *BMC Psychiatry*. null
- *Brain and Language*. null
- *Brain and Mind*. null
- *Brain Research*. null
- *British Journal of Learning Disabilities*. null
- *Cerebrospinal Fluid Research*. null
- *Clinical Psychiatry News*. null
- *Cognitive Brain Research*. null
- *Cognitive Neuropsychiatry*. null
- *Developmental Neuropsychology*. null
- *Drug and Alcohol Review*. null
- *Experimental Brain Research*. null
- Franklin, J. C., Hessel, E. T., Aaron, R. V., Arthur, M. S., Heilbron, N., & Prinstein, M. J. (2010). The functions of nonsuicidal self-injury: Support for cognitive-affective regulation and opponent processes from a novel psychophysiological paradigm. *Journal of Abnormal Psychology*, 119(4), 850–862.
- *Genes, Brain and Behavior*. null
- *Harvard Review of Psychiatry*. null
- *International Journal of Language & Communication Disorders*. null

- *International Journal of Neuroscience*. null
- *Journal of Clinical and Experimental Neuropsychology*. null
- *Journal of Cognitive Neuroscience*. null
- *Journal of Neural Transmission*. null
- *Journal of Neurogenetics (0167-7063)*. null
- *Journal of Neurolinguistics*. null
- *Journal of Neuroscience, Psychology, and Economics*. null
- *Journal of Pediatric Neurosciences*. null
- *Journal of Psychiatric Research*. null
- *Journal of Psychiatry & Neuroscience*. null
- *Journal of Sleep Research*. null
- *Journal of Speech, Language, and Hearing Research*. null
- *Journal of the International Neuropsychological Society*. null
- *Learning & Memory*. null
- McCarthy, M. M., Arnold, A. P., Ball, G. F., Blaustein, J. D., & deVries, G. J. (2012). Sex differences in the brain: The not so inconvenient truth. *Journal of Neuroscience*, 32(7), 2241–2247.
- *Nature Neuroscience*. null
- *Nature Reviews*. null
- Neisser, U., Boodoo, G., Bouchard, T. J., Boykin, A. W., Brody, N., Ceci, S. J., . . . Urbina, S. (1996). Intelligence: Knowns and unknowns. *American Psychologist*, 51(2), 77–101.
- *Neural Plasticity*. null
- *Neurobiology of Aging*. null
- *Neurobiology of Learning and Memory*. null
- *Neuropsychology Review*. null
- *Neuropsychology*. null
- *Neuroscience and Behavioral Physiology*. null
- *Neuroscience*. null
- *NIDA Notes*. null
- *Pain Medicine*. null
- *Psychological Medicine*. null
- *Psychopharmacology Update*. null
- *Quarterly Journal of Experimental Psychology*. null
- Robinson T. E., & Berridge, K. C. (1993). The neural basis of drug craving: An incentive-sensitization theory of addiction. *Brain Research Reviews*, 18(3), 247–291
- *Scientific American Mind*. null
- *Sexual and Relationship Therapy*. null
- *Sleep and Hypnosis*. null
- *Sleep*. null
- *Social Psychiatry and Psychiatric Epidemiology*. null
- Solomon, R. L., & Corbit, J. D. (1973). An opponent-process theory of motivation: II. Cigarette addiction. *Journal of Abnormal Psychology*, 81(2), 158–171.
- *Substance Use & Misuse*. null
- *The American Journal of Psychiatry*. null
- *The European Journal of Psychiatry*. null
- *The Journal of Neuroscience*. null
- *Trends in Cognitive Sciences*. null
- *Visual Cognition*. null
- *Visual Neuroscience*. null

External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL. Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- [All About Vision](http://www.allaboutvision.com/). (n.d.). Retrieved from <http://www.allaboutvision.com/>
- Grubin, D. (Producer). (2002). *The secret life of the brain* [Video]. Retrieved from <http://www.pbs.org/wnet/brain/>
- Healing Center. (n.d.). *Limbic system: The center of emotions*. Retrieved from <http://www.healing-arts.org/n-r-limbic.htm>
- National Institute of Drug Abuse. (n.d.). *Club drugs*. Retrieved from <http://www.drugabuse.gov/drugs-abuse/club-drugs>
- [National Institutes of Health \(NIH\)](http://www.nih.gov/). (n.d.). Retrieved from <http://www.nih.gov/>
- [Society for Neuroscience](http://www.sfn.org/). (n.d.). Retrieved from <http://www.sfn.org/>
- U.S. Department of Education. (n.d.). *Family Educational Rights and Privacy Act (FERPA)*. <https://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html>

- U.S. Department of Health & Human Services. (n.d.). [Summary of the HIPAA privacy rule](https://www.hhs.gov/hipaa/for-professionals/privacy/laws-regulations/index.html). <https://www.hhs.gov/hipaa/for-professionals/privacy/laws-regulations/index.html>
- Webvision. (n.d.). [Photoreceptors by Helga Klob](http://webvision.med.utah.edu/book/part-ii-anatomy-and-physiology-of-the-retina/photoreceptors/). Retrieved from <http://webvision.med.utah.edu/book/part-ii-anatomy-and-physiology-of-the-retina/photoreceptors/>

Unit 1 >> Introduction to Biopsychology

Introduction

In this introductory unit of biopsychology, you will explore a number of topics that will prepare you for the deeper journey into the course.

As a branch of psychology, contemporary biopsychology studies the relationships between behavior and (mainly) the brain. Before this central hypothesis was established, the popular mind-brain questions included "What is the mind?" and "Does the mind control the brain or conversely?" Numerous scientists, psychologists, philosophers, and other scholars answered these questions differently and developed a variety of theories to explain their rationale. In the first theme of this unit, you will learn about the history of biological psychology development by exploring the contributions of Descartes, Fritsch and Hitzig, Helmholtz, Broca, Gall, and Lashley.

Biopsychology, also known as behavioral neuroscience, has become a well-established multidisciplinary study that uses complicated techniques to reveal the relationship between brain functions and human behaviors. This brings us to the second theme of this unit: research methods and techniques. Here, we will discuss the relationship between science, research, and theory in biological and behavioral studies. We will also explore some traditional techniques used by biopsychologists, such as staining and imaging neurons.

The third theme of this unit is the relationship between heredity and environmental influences in shaping behavior. One of the most exciting scientific discoveries in the twentieth century was our understanding of nucleic acid through the structures and functions of DNA and RNA. The Human Genome Project—a global collaboration of biotechnology—has greatly advanced our understanding of one of the original questions in biopsychology: nature or nurture?

Last but not the least, this unit will help you develop awareness and thoughtful consideration of research ethics when human and animal subjects are involved in biopsychology research.

Learning Activities

u01s1 - Studies

Readings

Use your *Brain & Behavior: An Introduction to Behavioral Neuroscience* text to complete the following:

- Read Chapter 1, "What Is Behavioral Neuroscience?," pages 1–18. In this chapter, the author discusses the origins of behavioral neuroscience as well as the genetic influence on behavior.
- Read Chapter 4, "The Methods and Ethics of Research," pages 84–115. In this chapter, you will be introduced to biopsychology research techniques and you will explore why biopsychology creates ethical concerns.

Multimedia

The brain is divided into different regions so that each carries out a specific task. Click **Brain Regions and Functions** to view the major regions of the brain and learn about their specific functions.

Optional Resources

- Watch PBS's [The Secret Life of the Brain](#).

Course Resources

Brain Regions and Functions

u01s2 - Methods of Research

To properly understand how biopsychology works, it is important that you understand how contemporary researchers test their ideas and explore questions in the field of biopsychology. Chapter 4, "The Methods and Ethics of Research," in *Brain & Behavior* introduces four different research designs:

1. Naturalistic observation.
2. Case study.
3. Survey.
4. Experiment.

Each of these research designs is used in studying brain and behavior, yet they all have their shortcomings. Please select one of these three research topics:

- Neurobiology of ecstasy (MDMA) abuse.
- Progression of reading ability in a child diagnosed with autism.
- Effectiveness of a new drug to treat depression.

u01s3 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view a biological psychology time line that illustrates and describes milestones in theory development and theorists involved in this evolving profession.

The Biological Psychology Time Line highlights various theorists and theories relevant to the evolution of our field, beginning in ancient times with the philosophical musings of Plato (432 BCE–347 BCE) and Aristotle (384 BCE–322 BCE). Later developments in this line of thought include Descartes's dualism (1596–1650), Leibniz's parallelism (1646–1716), and Berkeley's theory of the context of associationism (1685–1758). These ideas re-emerge in the experimentally based theories of William James (1842–1910), who is known as the father of American psychology, and they are also evident in the work of contemporary theorists such as Candace Pert (1948–2013), whose work on peptides tied emotions to physiological mechanisms, and John Searle (1932–), who tied conscious intention to brain states. You will visit the Biological Psychology Time Line throughout our course. This time line illustrates how our understanding of the relationship among brain, mind, and body has changed based on new developments in theory, practice, and application, and will assist you in synthesizing your own perspectives on historical and emerging questions and issues in our discipline.

Course Resources

Biological Psychology Time Line

u01s4 - Your Online ePortfolio

Online ePortfolios serve two key purposes: 1) to support learning and reflection, and 2) to be used as a showcase tool. Your learning journey can be documented, and ePortfolios contribute to lifelong learning and growth through reflection and sharing. Online ePortfolios can also be shared with employers and peers to present artifacts that demonstrate your accomplishments at Capella.

Using ePortfolio to Prepare for Your Capstone

Your program may culminate in a capstone course. At that time you may be required to show evidence of your learning throughout the program by referring to multiple assessments that you have created. You will be telling a story about your learning throughout the program using artifacts you have collected during many of these courses.

Using ePortfolio to Build Your Career

As you are preparing to tell your story in the professional world, leverage your ePortfolio artifacts to demonstrate the knowledge and competencies you have gained through your program in professional conversations, performance reviews, and interviews.

To do that, reflect on the knowledge and skills you have gained from your courses and the elements you have put in your portfolio, along with how you have already applied these things to your professional life or how you might apply them in the future.

Next, create your story or talking points to tell your professional story.

Saving Your Documents to ePortfolio

You will need a place to store your documents in an organized fashion so that you can access them at a later date. Do not rely on the courseroom to store your assignments for you as you will lose access to the courseroom after you have completed the course. Capella uses a cloud-based portfolio platform to facilitate your organization of the artifacts you create throughout your program.

To make an online portfolio useful, it is essential that it is organized clearly and that important files of any format are accessible. Read the [Online ePortfolio Guidelines \[PDF\]](#) to ensure you set up your online portfolio correctly. For more information on ePortfolio visit the Campus [ePortfolio](#) page.

Privacy Statement

Capella complies with privacy laws designed to protect the privacy of personal information. While you may voluntarily share your own information publicly, you are obligated to protect the personal information of others that may be associated with your academic or professional development. Before sharing information and material in any ePortfolio that is set up to be shared externally to your program at Capella, please consider privacy obligations in relation to protected populations who may be included or referenced in your academic or clinical work. Refer to the [Family Educational Rights and Privacy Act \(FERPA\)](#) and/or the [Health Insurance Portability and Accountability Act \(HIPAA\)](#) if you have specific questions or concerns about your choices.

u01s5 - Introducing Yellowdig

This course uses a tool called Yellowdig to facilitate course discussions. Yellowdig provides an interface that resembles modern and familiar social media platforms and makes it easier to post and respond to discussions. It also makes posting media within your discussions simpler.

A Yellowdig account has been automatically created for you. The first time you access a Yellowdig discussion, you will be asked to acknowledge and confirm your account. **Note:** You will have the best experience using Yellowdig with the Chrome browser.

To learn more about how this course uses Yellowdig, visit the [Yellowdig Forums](#) page on Campus.

If you have trouble getting connected to the Yellowdig discussion boards, contact [Capella Technical Support](#).

Grading in Yellowdig

Yellowdig uses a unique discussion points grading system. In this course, points will initially be given as follows:

- **Initial post of 50 or more words:** *30 points.*
- **Comment (response) of 30 or more words on another learner's post:** *30 points.*

Additional points will be awarded by your instructor in the form of badges. Badges in this course include:

- **Outstanding Comment.** For insightful comment on another learner's post: *5 points.*
- **Quality Content.** For outstanding content: *5 points.*
- **Critical Thinking.** For showing critical thinking in your post: *5 points.*
- **APA-Style Ninja.** For outstanding citations and references: *5 points.*
- **Grammar Geek.** For outstanding grammar and sentence structure: *5 points.*

You can earn a maximum of **120 points** each week. Once you reach that maximum, you can still continue your conversations on Yellowdig, but you'll stop earning points for the week.

Your final grade will be based on the total number of points you have earned throughout the course. You can earn up to a maximum of 1000 points, for a final discussion participation grade of 100%.

Note that this means you do not need to earn the maximum 120 points available each week to get full credit for participation. The point structure is designed so you can earn extra points during the week to balance out other weeks where you may not earn as many.

Checking Your Progress

To help you stay on track, Yellowdig calculates how many points you should try to earn per week to ensure you end the course with a top grade. You can find this information by clicking on the points dashboard area of Yellowdig (on the left-hand menu within the tool).

Your participation grade in your classroom My Grades area will be periodically updated by Yellowdig throughout the day. Each week it will account for the points you could accumulate that week as well as the points you already have. So, do not be surprised if your grade changes; you'll get used to the pattern in a few weeks.

Instead, focus on the points displayed in Yellowdig. If you are hitting your maximum points each week, you are good. In fact, you are more than good! Aim for 100 to 120 points each week to stay on track.

Using Yellowdig

Yellowdig is designed to take a less formal approach to discussing course content. Think of it as a playground for ideas. We still expect you to use APA-style citations and references. However, we want you to focus on shorter, more succinct posts on the content rather than writing short essays. Try to start a conversation on the new topics you learn each week. Also share additional resources with one another to help better understand and explore the new ideas you'll learn.

This is an environment designed to give you flexibility and control. Take advantage of that to learn in the manner best suited to you.

Yellowdig Features

- You can like or love each other's posts.
- You can use hashtags.
- You can filter what you see (icon on the top of the screen).
- You can use the sort function (icon on the top of the screen) to control the order of the posts.
- Weekly points (on the left) will tell you how many points you've earned that week. Aim for 100 to 120 points each week to stay on track.
- You can embed outside resources like video, pictures, and links.
- You can create polls or videos from within your post while you are writing it.

u01d1 - Understanding Behavioral Neuroscience

This course uses a tool called Yellowdig to facilitate discussions. If you have not yet read the Introducing Yellowdig study in this unit, read that now to learn what Yellowdig is and how to use it. The following resources will be provided in every Yellowdig discussion in this course for on-the-spot help using Yellowdig and understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about the mind-brain problem. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of behavioral neuroscience mentioned in Chapter 1 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about behavioral neuroscience in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Also, discuss why this made the news and why it is important.
- Discuss an area of ethics mentioned in Chapter 4 that stood out to you. Why did this catch your attention? Can you see this information affecting your personal or professional life?
- Find a video about ethics on human participants. Share the link and a short summary. Also, share what stood out to you the most or surprised you.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

Unit 2 >> Neural Foundations of Behavior

Introduction

In this unit, you will explore several critical topics that provide cellular insights of brain anatomy and physiology. The hypothetical issues you will examine include:

- Neuron communication.
- The structure and activity relationship of the brain.
- Artificial neural network and the simulation of brain functions.

More specifically, you will survey the basic concepts of three types of neurons, neurotransmitters, and electrolytes to regulate neuronal communication; structural features of the synapse; resting potential and action potential; and physiological features of the forebrain, midbrain, hindbrain, and spinal cord. One of the fundamental questions in this unit is, What behavior impairment will one have when a specific nervous system region is injured?

You will also learn that without nervous system injury, behavior impairment can be caused by the imbalance of electrolytes in the brain or by the deficiency of a neurotransmitter (such as dopamine). While we will extend our study of behavioral problems and cognitive impairment in future units, here is a good opportunity to establish a knowledge base of the central nervous system's biological aspects, including the brain and spinal cord.

Finally, you will research the following topic to apply neurological concepts of the brain: Can we make an artificial brain mimic the control of behaviors?

Learning Activities

u02s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 2, "Communication Within the Nervous System," pages 20–47. In this chapter, the author explains how neurons communicate with each other.
- Read Chapter 3, "The Organization and Functions of the Nervous System," pages 48–83. In this chapter, you will learn about the major structures of the nervous system and some of their functions.
- Review Chapter 4, "The Methods and Ethics of Research" previously read in Unit 1.

Multimedia

- Human and animal brains are hardwired with reward pathways, also known as *pleasure centers* or *pleasure systems*. Click **The Reward Pathway** to learn about reward pathways.
- Click **Neurotransmitters Matching** to complete the activity.

Visit the Sage *Brain & Behavior* study website to view the following animations:

- [The Neural Impulse](#) | [Transcript](#).
- [Transmission at the Synapse](#) | [Transcript](#).
- [The Spinal Cord](#) | [Transcript](#).

Optional Resources

- [National Institutes of Health](#). This government website is a great resource for medical research and training. Although targeted at teachers, this site is also useful for students and is easy to navigate. Use the search box at the top of the Web page to locate specific information.

Course Resources

Neurotransmitters Matching

The Reward Pathway

u02s2 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view a biological psychology time line, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

Great strides were made in understanding the underpinnings of action, thought, and perception in the 18th century, beginning with Gall's (1758–1828) theory of localization of function and his practice of dissecting specific nerve fibers. Building on that method, Charles Bell (1774–1842) experimented with localization of motor and sensory neurons, and established the Bell-Magendhi law, while Müller (1801–1858) established the law of specific nerve energies in laboratory experiments. The electrical basis of nerve impulses was established by Galvani (1737–1798) and the chemical transmission of nerve impulses was identified by Otto Loewi (1873–1961). In 1936, Loewi identified acetylcholine as the first neurotransmitter. Eric Kandel's (1929–) experiments with *Aplysia* demonstrated that interactions with the environment increase the dendritic connection between neurons.

Course Resources

Biological Psychology Time Line

u02d1 - Brain and Body

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about neurons, action potential, neurotransmitters, or other aspects of the neurotransmission process. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of communication in the nervous system in Chapter 2 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about neuroscience research in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Find a video about an aspect of the nervous system. Share the link and a short summary. Also, share what stood out to you the most or surprised you.

- Find a scholarly, peer-reviewed article showing empirical research in an area of neuroscience. If you want to get a head start on your Unit 5 assignment, you can read the assignment instructions in Unit 5 and choose an article that would apply. Post a link to the article and a brief summary of the research methods used and the author's conclusions.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

Unit 3 >> Neurological Mechanisms of Substance Abuse

Introduction

In this unit, you will continue to explore the relationships between behaviors and the brain, but in the extreme condition of drug addiction. The central hypothesis is that behavioral and cognitive impairment caused by drug addiction may be due to changes in the brain and the imbalance of neurotransmitters in the neuron. In addition, physical changes of the brain (usually referred to as *neurodegeneration*) make some addictions lifelong. The only chapter assigned in this unit, Chapter 5, will provide details of psychoactive drug classification, including the brain's reward pathway of addiction and the roles of dopamine and serotonin in addiction.

Two key terms that demonstrate the mechanisms of drug addiction are *reward* and *reinforcer*. Reward refers to the positive effect an object or condition, such as drugs, food, sexual contact, and warmth, has on the user. A reinforcer is any object or event that increases the probability of the response that precedes it.

Finally, you will look at current scientific discoveries related to the role of genes in addiction. This will help further your understanding of heredity and environmental influences on learning and cognition behaviors.

Learning Activities

u03s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 5, "Drugs, Addiction, and Reward," pages 116–143. In this chapter, you will learn about what happens to the brain during addiction.

Multimedia

Click **Addiction and Dependence** to learn about addiction versus dependence pathways in the human brain.

Optional Resources

If you choose, review the following:

- [Club Drugs](#). This NIDA website focuses on ecstasy (MDMA) and other drugs associated with club culture. There is a link to an excellent slide presentation on the neurobiology of ecstasy as well as trends and statistics on drug use by young people.
- Franklin, Hessel, Aaron, Arthur, Heilbron, and Prinstein's 2010 article, "The Functions of Nonsuicidal Self-Injury: Support for Cognitive-Affective Regulation and Opponent Processes From a Novel Psychophysiological Paradigm," from the *Journal of Abnormal Psychology*, volume 119, issue 4, pages 850–862.
- Robinson and Berridge's 1993 article, "The Neural Basis of Drug Craving: An Incentive-Sensitization Theory of Addiction," from *Brain Research Reviews*, volume 18, issue 3, pages 247–291.
- Solomon and Corbit's 1973 article, "An Opponent-Process Theory of Motivation: II. Cigarette Addiction," from the *Journal of Abnormal Psychology*, volume 81, issue 2, pages 158–171.

Addiction and Dependence

u03s2 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view the presentation, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

In 1967, Vincent Dole and his wife Dr. Marie Nyswander put forth their groundbreaking research into the role of heroin as a metabolic disease. Contemporary researcher Henri Begleiter (1935–2006) furthered our understanding of the neurobiology of addiction with his studies of alcoholism. Researchers Hans Kosterlitz, Candace Pert, and Solomon Snyder have added significantly to our understanding of neural involvement in addictions by isolating opiate receptors in the brain and studying the role of enkephalins in addiction. Richard Soloman (1918–1995) and his colleague, John Corbit, tied their opponent-process theory of motivation, which was published in 1973, to withdrawal from addictions (1980), and to cigarette addictions (1984). The neural basis of drug craving was explored in the 1993 research of Terry Robinson and Kent Berridge, and most recently has been extended (by Franklin et al., 2010) into the area of pathological behaviors such as nonsuicidal self-injury.

Biological Psychology Time Line

u03d1 - Addiction and the Brain

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about how addiction works in the brain. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of drugs, addictions, and rewards in Chapter 5 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about addictions research in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Find a video about how a specific drug works in the brain. Share the link and a short summary. Also, share what stood out to you the most or surprised you.
- Find a scholarly, peer-reviewed article showing empirical research in an area of neuroscience. If you want to get a head start on your Unit 5 assignment, you can read the assignment instructions in Unit 5 and chose an article that would apply. Post a link to the article and a brief summary of the research methods used and the author's conclusions.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Psychology Undergraduate Discussion Scoring Guide

u03q1 - Unit 3 Quiz 1

The unit quizzes provide an opportunity to demonstrate your mastery of the following course competencies:

- Analyze research methods used in the study of biological psychology.
- Apply psychological theories to topics in biological psychology.
- Apply scholarly research findings to topics in biological psychology.

Be sure to complete the unit readings first. This quiz will test your knowledge of biological psychology.

- There is no time limit on the quiz once you open it.
- You may access the quiz to preview the questions; however, once your quiz is submitted you cannot retake it to change your grade.
- You must complete this quiz during Unit 3.
- There are 100 total points possible. Each question is worth 5 points.
- Once you submit the quiz, you will receive immediate feedback and a grade.

Click the linked quiz title to access the quiz. If you have any issues with the quiz, contact your instructor.

Unit 4 >> Motivation and Emotion

Introduction

In this unit, on the basis of your understanding about the reward mechanism, you will first discuss motivation. Motivation refers to the set of factors that initiate, sustain, and direct behaviors. We will contrast several motivation theories, including instinct theory, drive theory, incentive theory, and arousal theory. These theories have been widely applied in psychological practice, where they are linked to other theories. For example, recent attachment theory studies examined the circumstances surrounding motivation and behavior in adolescents. In medical practice, drive theory is combined with neuroendocrine theory to understand the relationship between homeostasis and hunger. Understanding the neurobiology of hunger and appetite may ultimately lead to treatments for obesity and eating disorders.

The second topic of this unit study is emotion. Emotion is an increase or decrease in physiological activity that is accompanied by feelings that are characteristic of the emotion, and often accompanied by a characteristic behavior or facial expression. According to the James-Lange theory, emotional experience results from the physiological arousal that precedes it, and different emotions are the result of different patterns of arousal. According to Schachter and Singer's cognitive theory, physiological arousal contributes only to the emotion's intensity, while the identity of the emotion is based on the cognitive assessment of the situation. You will continue to survey the neural foundations for emotion and compare the James-Lange and Schachter-Singer theories of emotion. For example, the amygdala has long been known to be critical for generating responses to fear. Recent evidence suggests that it may have a more complex role in regulating emotion.

Finally, you will explore the roles of emotion and conscious awareness in controlling behavior.

Learning Activities

u04s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 6, "Motivation and the Regulation of Internal States," pages 144–177. In this chapter, you will learn how homeostasis and drive theory are key to understanding physiological motivation.

- Read Chapter 8, "Emotion and Health," pages 210–237. In this chapter, the author examines how the brain, and the rest of the human body, participate in emotion.

Multimedia

Visit the Sage [Brain & Behavior](#) study site to view the following animation:

- [Hunger, Satiation, and the Regulation of Fat Reserves | Transcript](#).

Optional Resources

If you choose, review the following:

- The Healing Center's [Limbic System: The Center of Emotions](#). This site provides an illustrated overview of the neural circuitry and brain areas contained in the limbic system.

u04s2 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view the presentation, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

One of the earliest theories on the neurobiology of emotion emerged in 1890 with the publication of William James's (1842–1910) seminal work, *The Principles of Psychology*. The James-Lange theory of emotion posits physiological arousal in the form of a visceral response instigates emotional reactions. Walter Cannon (1871–1945) strenuously objected to the James-Lange theory and experimentally stimulated areas of the cerebral cortex, specifically the dorsal thalamus and hypothalamus to elicit emotional responsivity. The drive reduction theory of Clark Hull (1884–1952) is based on the premise that internal tension resulting from unmet needs serves to motivate behavior. The drive reduction theory ties together theories of emotion and motivation as instinctive and visceral, first posited by James, and later theories of behavioral incentives as motivators and arousal theories that explain the need to maintain internal homeostatic balance by either increasing or reducing physiological arousal. Stanley Schachter (1922–1977) and Jerome Singer (1934–2010) presented yet a different theory of emotion and motivation in 1962. In empirical studies, their two-factor theory demonstrated that a combination of physiological arousal and cognitive labeling based on environmental cues are necessary in the experience of emotion.

Course Resources

Biological Psychology Time Line

u04d1 - Motivation, Emotion, and Behavior

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about motivation and the brain. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.

- Discuss an area of motivation and the regulation of internal states in Chapter 6 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about emotions and the brain in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Discuss an area of emotion and health in Chapter 8 that stood out to you. Why did this catch your attention? Can you see this information affecting your personal or professional life?
- Find a video about an aspect of emotions and the brain. Share the link and a short summary. Also, share what stood out to you the most or surprised you.
- Find a scholarly, peer-reviewed article showing empirical research in an area of neuroscience. If you want to get a head start on your Unit 5 assignment, you can read the assignment instructions in Unit 5 and chose an article that would apply. Post a link to the article and a brief summary of the research methods used and the author's conclusions.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

Unit 5 >> Hearing and Language

Introduction

One of the central hypotheses in psychology is the relationship between stimulus and response. This unit will introduce hearing and language, two human abilities relevant to the hypothesis of stimulus and response. Your understanding of these two abilities will help build a concept of the neural basis of human behaviors interacting with the world. The only chapter of this unit, Chapter 9, will present topics such as the anatomical mechanism of hearing, frequency analysis, brain process of sounds from pure tones to speech, the anatomical location and function of Broca's and Wernicke's areas, the language roles of the left and right hemispheres of the brain, and the evolutionary history of human language with proof found in the brains of other animals.

Finally, you are encouraged to research recent technologies employed in the study of brain regions regulating speech. For example, MRI studies are revealing areas within the brain that may play a role in language and reading. Another example is that both Broca's and Wernicke's areas are fundamental to speech ability but the specific mechanism of how each plays into oral language is still unclear. The function of the Broca and Wernicke areas is still evolving and challenges psychologists, neurologists, and speech therapists.

Learning Activities

u05s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 9, "Hearing and Language," pages 238–273. In this chapter, you will learn about the auditory mechanism and how it works.

Multimedia

Visit the Sage [Brain & Behavior](#) study site to view the following animations:

- [Place Analysis of Auditory Frequency](#) | [Transcript](#).
- [Sound Localization](#) | [Transcript](#).
- [The Wernicke-Geschwind Model of Language](#) | [Transcript](#).

u05s2 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view the presentation, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

Our understanding of brain areas associated with hearing and language can be traced to the original theories of Franz Gall (1758–1828), who first proposed that the brain is composed of separate organs of function. Pierre Broca (1824–1880) was able to experimentally demonstrate the localization of language expression in the left frontal lobe and Karl Wernicke (1848–1904) experimentally demonstrated cortical areas involved in language comprehension. Georg Békésy's (1889–1972) dissections of the human ear led to a better understanding of the conduction of sound via the basilar membrane through the ear canal to the brain. In contrast to theories of localization, Jean Flourens (1794–1867) posited a theory of mass action and equipotentiality. Building on Flourens's theory of equipotentiality, Karl Lashley (1890–1958) theorized that simple mechanisms are localized while more complex brain mechanisms are not bound to specific structures. Lashley's principle of mass action and the engram as a "memory trace" responsible for storing long-term memories has contributed to contemporary studies on Alzheimer's disease.

Course Resources

Biological Psychology Time Line

u05a1 - Methods of Research

For your Methods of Research assignment, use the Capella library to locate a minimum of three peer-reviewed journal articles (published within the last 10 years) that discuss a biological psychology topic of interest to you. For example, you might be interested in:

- Neurobiology of ecstasy (MDMA) abuse.
- Progression of reading ability in a child diagnosed with autism.
- Effectiveness of a new drug to treat depression.

You are not limited to these topics, but may choose one of these if you are interested. These are listed to help give you an idea of types of appropriate topics.

You will be using these resources to help support a proposed research study of your choosing in Unit 7 and then applying what you learn in an assignment in Unit 9. Note that the assignments in this course build on one another. It is a good idea to look ahead to the assignments in Units 7 and 9 to begin to think about a topic you might be interested in researching. This is a good time to select articles for this assignment that will help support your ideas for the Unit 7 and Unit 9 assignments.

Submit your analysis of the articles you selected for this assignment in accordance with the criteria listed below:

Format your paper using the following headings, as well as the Methods of Research Template (linked in Resources):

- **Topic:** Identify the topic and describe the search strategy used for locating articles for the review.
- **Article Analysis:** For each article, analyze the articles using the headings below. Use appropriate in-text citations of the article, per current APA guidelines:
 - The research method(s) used in the articles reviewed.
 - Key variables in the hypothesis or phenomena of interest.
 - Description of how the hypothesis was supported (or not) and how questions were answered (or not).
 - Determination and explanation of whether the study was (or was not) conducted safely and ethically by the authors.
- **Summary:**
 - Summary determination and explanation of whether the studies included in the review were (or were not) conducted safely and ethically by the authors. Substantiate your views with evidence from the studies.
 - With the topic you selected, decide which of the research methods you believe is the most appropriate to further study the problem. Explain why.

Paper Requirements

- **Number of Resources:** 3–5 peer-reviewed journal articles.
- **Length:** 5–7 pages.

- **Format:** Formatted using the Methods of Research Template, linked in the Resources. Use current APA style and formatting.

Submit the Methods of Research assignment by Sunday of Unit 5.

You may choose to save this learning activity to your ePortfolio.

Course Resources

[ePortfolio](#)

[APA Style and Format](#)

Methods of Research Template

u05d1 - Hearing and Saying

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about hearing in the brain. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of hearing and language in Chapter 9 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about language and the brain in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Find a video about language and the brain. Share the link and a short summary. Also, share what stood out to you the most or surprised you.
- Find a scholarly, peer-reviewed article showing empirical research in an area of neuroscience. You may want to share an article you chose for the assignment due this week. Post a link to the article and a brief summary of the research methods used and the author's conclusions.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

Unit 6 >> Vision and Visual Perception

Introduction

Humans use different parts of their brain to distinguish objects from people. In fact, we may have specialized neurons for recognizing faces. This relates to the main theme of this unit: vision and visual perception. Just like the hypothetical questions in the previous unit, many questions about human vision

are unanswered. For example, different areas of the brain respond differently to visual recognition tasks, but how and why these areas cooperate to process visual information remains unclear. Another example, the visual cortex contains several layers—the functional roles of which are the subject of intense investigation. Questions include, Why might the brain specialize to the point where a single neuron is dedicated to the recognition of a specific object or person? and Which factors or cues influence how these neurons specialize and what they ultimately respond to?

You will start this unit examining the eye structure that processes visual information. For example, rods and cones are only part of the neural machinery needed to gather and process a visual landscape. Next, you will explore current theories of vision to understand how color, form, movement, and spatial location are handled in the brain.

Finally, you will survey visual disorders caused by brain damage, which in turn will further explain the brain regional functions.

Learning Activities

u06s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 10, "Vision and Visual Perception," pages 274–311. In this chapter, the author discusses eye structure and the major theories of color and form vision.

Multimedia

Visit the Sage *Brain & Behavior* study site to view the following animations:

- [Visual Projections to the Cortex](#) | [Transcript](#).
- [Visual Detection of Edges](#) | [Transcript](#).

Optional Resources

If you choose, review the following:

- [All About Vision](#). This site has highly detailed information on the eye and related topics. Links take the user to information on eye structure, conditions, treatment, et cetera.
- Webvision's [Photoreceptors by Helga Kolb](#). This site has high magnification images and animations of rod and cone structures.

u06s2 - Study Proposal Preparation

In preparation for your Unit 7 Study Proposal assignment, read the assignment instructions and submission requirements.

u06s3 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view the presentation, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

Early theories of localization based on the work of Franz Gall (1758–1828) also influenced research on the localization of visual information processing. In 1881, Hermann Munk (1839–1912) accurately located visual information processing in the occipital cortex. Jan Purkyne (1787–1869) investigated the effect of luminosity in dim and bright light in adapting to darkness while Thomas Young (1773–1829) postulated a theory of photoreceptors in retina cones, in 1802. Hermann von Helmholtz (1821–1894) furthered Young's theory in 1850 by identifying red, blue, and green color receptors. Ewald Hering (1834–1918) disagreed with the Young-Helmholtz trichromatic theory and, in 1892, proposed the opponent process theory of color vision. George Wald

(1906–1977) of Harvard further investigated the role of cone cells in color vision. David Hubel (1926–2013) and Torsten Wiesel (1924–) explored the role of information processing through the visual cortex in the form of ocular dominance.

Course Resources

Biological Psychology Time Line

u06d1 - Visual Sensation and Perception

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about vision and the brain. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of vision and visual perception in Chapter 10 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about vision and the brain in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Find a video about the Stroop effect, the speed of processing hypothesis, or the selective attention hypothesis. Share the link and a short summary. Also, share what stood out to you the most or surprised you.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

u06q1 - Unit 6 Quiz 1

The unit quizzes provide an opportunity for you to demonstrate your mastery of the following course competencies:

- Analyze research methods used in the study of biological psychology.
- Apply psychological theories to topics in biological psychology.
- Apply scholarly research findings to topics in biological psychology.

Be sure to complete the unit readings first. This quiz will test your knowledge of biological psychology.

- There is no time limit on the quiz once you open it.
- You may access the quiz to preview the questions; however, once your quiz is submitted you cannot retake it to change your grade.
- You must complete this quiz during Unit 6.
- There are 100 total points possible. Each question is worth 5 points.

- Once you submit the quiz, you will receive immediate feedback and a grade.

Click the linked quiz title to access the quiz. If you have any issues with the quiz, contact your instructor.

Unit 7 >> Learning and Memory

Introduction

Anterograde amnesia refers to impairment in forming new memories while *retrograde amnesia* is the inability to remember events prior to impairment. Anterograde and retrograde amnesia are common learning and memory disorders. They have been linked to damage in certain brain structures, and the severity of amnesia has been linked to the amount of structural damage within the brain. The brain tissues hypothetically responsible for memory and learning include the hippocampus and the amygdala. All memories are not stored in a single area, nor is each memory distributed throughout the brain. Rather, different memories are located in different cortical areas where the information they are based on was processed.

This unit introduces the concepts of memory and learning. These are two of the most exciting topics in biopsychological research. The central hypothesis is focused on how and where memories are stored in the brain. Another hypothesis is how aging and other disorders impair learning. More specifically, we will explore the topics of amnesia and memory storage, the mechanism of memory consolidation and retrieval, synaptic changes during learning, the role of long-term potential in learning, effects of aging on memory loss, Alzheimer's disease, and Korsakoff's syndrome. Finally, we will explore recent studies of genetic intervention for Alzheimer's disease.

Learning Activities

u07s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 12, "Learning and Memory," pages 344–371. In this chapter, you will learn how and where memories are stored in the brain.

Multimedia

Visit the Sage [*Brain & Behavior*](#) study site to view the following animations:

- [Associative Long-Term Potentiation | Transcript](#).
- [Glutamate's Role in Long-Term Potentiation | Transcript](#).

u07s2 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view the presentation, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

Ramon Cajal (1852–1934) richly deserves the recognition as "father of modern neuropsychology" for stating the hypothesis that memory is stored in the synaptic spaces that allow for communication between neurons. In 1949, Donald Hebb (1904–1985) proposed that neurons undergo metabolic changes that stimulate the growth of new connections, thereby enhancing their ability to communicate. In 1965, Eric Kandel (1929–) demonstrated in the laboratory that environmental influences can stimulate the growth of dendritic spines. Among other ideas, this groundbreaking line of research has led to the experiments in long-term potentiation (LTP) begun in 1966 by Terje Lømo, in which excitatory post-synaptic potentials in the cortex, amygdala, and cerebellum have been shown to increase dendritic growth. Contemporary research has associated alterations in LTP with a broad range of neuropsychological problems including depression, Alzheimer's, Parkinson's, epilepsy, and addictions.

u07a1 - Study Proposal

For your Study Proposal assignment, you will apply knowledge of theory and research in the study of biological psychology by writing a study proposal and providing a detailed summary outline of the research plan. This topic should be of your choosing, and builds on the information you identified on research methods currently used in the field, which you completed in Unit 5.

For this assignment, propose a study plan in which you will research the hypothesis for a research problem of your choosing, relevant to biological psychology. Format your paper using the following headings, as well as the Study Proposal Template (linked in Resources):

- **Research problem:**
 - State the problem that underlies the topic for your research proposal.
 - Evaluate physiological connections based on knowledge of physiological mechanisms, neural transmission, and neurotransmitter function gained in this course.
- **Literature Review:** Provide an effective literature review of other studies done on the same research problem. This section may include information obtained in your Unit 5 research methods paper.
- **Importance or Implications to Biological Psychology:** Discuss the importance or implications of this research problem to biological psychology.
- **Research methods:**
 - Discuss the research method and design chosen for your proposed study from the four identified in Chapter 4 of *Brain & Behavior*.
 - Naturalistic observation.
 - Case study.
 - Survey.
 - Experiment.
 - Clarify a rationale for the research method chosen to be used in this study.
- **Hypothesis Verification:** State the hypothesis your study plan is designed to test and any questions that will guide your research plan.
- **Validity:** Describe how the validity of the research will be ensured.
- **Ethical Criteria:** Discuss the necessary criteria to ensure the study will be conducted safely and ethically.
- **Summary:** Summarize your study plan and rationale for the chosen method and design.

Paper Requirements

- **Number of Resources:** Minimum number of 3–5 peer-reviewed journal articles.
- **Length:** 10–15 pages.
- **Format:** Formatted as shown in the Study Proposal Template, linked in the Resources. Use current APA style and formatting

Submit Methods of Research assignment by Sunday of Unit 7.

You may choose to save this learning activity to your ePortfolio.

Course Resources

Study Proposal Template

[ePortfolio](#)

[APA Style and Format](#)

u07d1 - Learning and Memory

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about learning and the brain. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of learning and memory in Chapter 12 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about learning and memory related to the brain in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Find a video about an aspect of memory and the brain. Share the link and a short summary. Also, share what stood out to you the most or surprised you.
- Find a scholarly, peer-reviewed article showing empirical research on learning and memory and the brain. Post a link to the article and a brief summary of the research methods used and the author's conclusions.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

Unit 8 >> Cognitive Behavior

Introduction

Intelligence is the ability to reason, to understand, and to profit from experience. The measure of intelligence is typically expressed as the intelligence quotient (IQ). A controversy that is critical to a biological understanding of intelligence is whether intelligence is a single capability or a collection of several independent abilities. Intelligence theorists tend to fall into one of two groups, lumpers or splitters. Lumpers claim that intelligence is a single, unitary capability, which is usually called the general factor, or simply "g." Splitters hold that intelligence is several mental abilities that are more or less independent of each other.

MRI studies of fraternal and identical twins found that general intelligence was correlated with both the volume of gray matter and the volume of white matter. IQ scores are also correlated with nerve conduction velocity. In addition, people who are more intelligent excel on tasks in which stimuli are presented for an extremely short interval and on tasks that require choices. One way the brain could achieve greater efficiency is through enhanced myelination of its neurons. These are well-established findings of human intelligence. However, many questions remain unanswered. For example, the etiology of autism and the reason for its increased prevalence remains unknown.

In this unit, you will continue to examine the relationship between the brain and behaviors under the specific topic of intelligence and cognitive functioning. Specific topics relate to the neural characteristics that contribute to intelligence, and the role of heredity and environment in forming intelligence. You will explore the relationship between brain size, neural conduction, processing speed and processing efficiency, and intelligence. You will also examine how conditions such as aging, intellectual disability, autism, and attention deficit hyperactivity disorder affect intelligence.

Learning Activities

u08s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 13, "Intelligence and Cognitive Functioning," pages 372–403. In this chapter, the author reviews problems with defining and measuring intelligence.

Optional Resources

If you choose, review the following:

- Neisser et al.'s 1996 article, "Intelligence: Knowns and Unknowns," from *American Psychologist*, volume 51, issue 2, pages 77–101. This is a comprehensive report by an APA task force. It presents detailed information on various concepts of intelligence, intelligence tests, the genetic influence on intelligence, environmental effects, and group effects.
- Newman and Just's 2005 chapter, "Neural Bases of Intelligence: A Perspective Based on Functional Neuroimaging," from Sternberg and Pretz's *Cognition & Intelligence: Identifying the Mechanisms of the Mind*, pages 88–103.

u08s2 - Study Applications Preparation

In preparation for your Unit 9 Study Applications assignment, read the assignment instructions and submission requirements.

u08s3 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view the presentation, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

Studies of cognitive function have their biological basis in the same historical research as learning and memory. The direction of this research, however, has been the focus on connectionism rather than on localization. Connections between neurons were first suggested by Herbert Spencer (1820–1903) in 1872. The concept also was mentioned by William James (1842–1910) in his *Principles of Psychology*. Hebb's (1904–1985) theory of neural learning in 1949 was later applied to a theory of artificial neural networks by Walter Pitts (1923–1969). The first program in artificial intelligence was put forth by Allen Newell (1927–1992) and Herbert Simon (1916–2001) in 1956, based on a theoretical foundation of information processing models. The Turing test was developed in 1950 by Alan Turing (1912–1954) to assess the level of intelligence exhibited by machines. Investigations into the neural basis of human intelligence begin with the work of Charles Spearman (1863–1945), who first posited a cognitive theory of general intelligence. This line of research has been controversial since the 1920s when Spearman first suggested it. Contemporary attempts to resolve the controversy continue even today, using MRIs to investigate the relationship between neural processing and intelligence. An excellent review of this work can be found in Newman and Just's 2005 chapter, "Neural Bases of Intelligence: A Perspective Based on Functional Neuroimaging," in Sternberg and Pretz's *Cognition & Intelligence: Identifying the Mechanisms of the Mind*.

Course Resources

Biological Psychology Time Line

u08d1 - Intelligence and Cognitive Functioning

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about intelligence and the brain. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of intelligence and cognitive function in Chapter 13 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about neuroscience research in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Find a video about cognitive function and the brain. Share the link and a short summary. Also, share what stood out to you the most or surprised you.
- Find a scholarly, peer-reviewed article on intelligence and the brain. Post a link to the article and a brief summary of the research methods used and the author's conclusions.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

Unit 9 >> Mental Health

Introduction

The first topic of this unit is neural etiology of schizophrenia. In 1911, Swiss psychiatrist Eugen Bleuler conceived the term *schizophrenia* by combining two Greek words meaning "split mind." It reflects the schizophrenic's distortion of thought and emotion, which causes a "split" from reality.

Schizophrenia is a disabling disorder characterized by perceptual, emotional, and intellectual deficits; loss of contact with reality; and inability to function in life. An estimated 3 million Americans will develop schizophrenia during their lifetimes and almost 100,000 patients take up 20 percent of psychiatric beds in the United States. Schizophrenia is more common in males, while disorders such as depression are more common in females. The prevalence, panel of symptoms, and treatment for affective disorders differs significantly between males and females. Bipolar disorder can manifest itself differently in girls and boys despite equivalent rates of diagnosis. These sex differences indicate a potential role for hormones in the emergence of affective disorders. Schizophrenia is a familial disorder, which means that the incidence of schizophrenia is higher among relatives of schizophrenics than it is in the general population. The heritability for schizophrenia has been estimated at between 60 and 90 percent, therefore 10 to 40 percent of the variability is due to environmental factors. In this unit, you will also look at the role of heredity in affective disorders. Both schizophrenia and affective disorders have been studied under the monoamine hypotheses.

Finally, you will examine anxiety disorders and the glutamate hypothesis.

Learning Activities

u09s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 7, "The Biology of Sex and Gender," pages 178–209. In this chapter, the author discusses the biological determination of sex.
- Read Chapter 14, "Psychological Disorders," pages 404–445. In this chapter, you will learn how heredity and environment interact to produce psychological disorders.

Optional Resource

If you choose, review the following article from the Capella library:

- McCarthy, Arnold, Ball, Blaustein, and deVries's 2012 article, "Sex Differences in the Brain: The Not So Inconvenient Truth," from the *Journal of Neuroscience*, volume 32, issue 7, pages 2241–2247.

u09s2 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view the presentation, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

The neural bases of psychological disorders actually began with the work of Franz Mesmer (1734–1815), whose interests formed the foundation for the field of hypnosis. Jean-Martin Charcot (1825–1893) was the first to associate somatic function with hypnosis, while Pierre Janet (1859–1947) established that mental events can radically alter bodily state. All three of these scientists strongly influenced Freud's psychoanalytic theory, which posits that unconscious conflict precipitates both physical and mental illnesses.

Despite continued exploration of genetic, environmental, intrapsychic, and neural indices of mental health, the current director of the National Institute of Mental Health (NIMH) has described the current mind-set as "mental disorders are brain disorders" (Insel, 2011, para. 1). Current research in the relationship between mental health and brain involvement is pervasive throughout the field. The same might be said for our current understanding of the relationship between neuropsychology and gender. deVries (2010) traces the neurobiology of gender from the influence of sex hormones on gonadal development in utero to brain changes and sex differences in neurochemistry in adulthood. Both sex-linked physical and mental disorders as well as gender identity are covered in this comprehensive review.

Reference

Insel, T. (2011, August 12). Director's blog: Mental illness defined as disruption in neural circuits [Blog post]. *National Institute of Mental Health*. Retrieved from <http://www.nimh.nih.gov/about/director/2011/mental-illness-defined-as-disruption-in-neural-circuits.shtml>

Course Resources

Biological Psychology Time Line

u09a1 - Study Applications

For your Study Applications assignment, you will apply learnings from the course as well as personal and professional ethics and behaviors. You will consider ways to apply your findings from your literature review and your proposed study, as well as principles, theories, and research in biological psychology to other careers outside of psychology, and to society in the form of public policy and professional practice.

To create your Study Applications, address the questions that follow. Use research findings reported in the articles you reported in Unit 7, along with other sources, such as previous readings from the course, the textbook, and additional Capella library sources to support and add depth to your answers. Your references should appear at the end of the paper. The entire paper must be in current APA style and format.

- Identify careers, other than psychology, that might benefit from a foundational knowledge of biological psychology.
- How can principles and theories of biological psychology be applied in professional practice in psychology and other professions?
- Within a context of social and cultural differences, describe practical applications of biological psychology to understanding values that underlie society, and the role of ethics in social practices and behaviors.
- How relevant has studying biological psychology been to your life, and how will you apply what you have learned in this course to your life?

Format your paper using the following headings, as well as the Study Applications Template (linked in Resources):

- Study applications.
 - Careers.
 - Professional practice.
 - Values.
 - Future life.
- References.

You may insert additional subheadings where necessary.

Paper Requirements

- **Written communication:** Written communication is free of errors that detract from the overall message.
- **Format:** Resources and citations are formatted according to current APA style and formatting. Use the Study Application Template, linked in Resources. In the final section of the assignment you are asked to apply the theories and principles of biological psychology to your own life and career. In this portion of the assignment, first-person language is acceptable; in other sections, the third-person rule continues to apply.
- **Number of resources:** Minimum of 3–5 peer-reviewed journal articles.
- **Length of paper:** 10–15 typed, double-spaced pages.
- **Font and font size:** Times new Roman, 12 point.

Submit the Study Applications assignment by Sunday.

You may choose to save this learning activity to your ePortfolio.

Course Resources

[ePortfolio](#)

[Study Applications Template](#)

[APA Style and Format](#)

u09d1 - Gender and Mental Health

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about sex, gender, and the brain. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of the biology of sex and gender in Chapter 7 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about psychological disorders and the brain in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Discuss an area of psychological disorders in Chapter 14 that stood out to you. Why did this catch your attention? Can you see this information affecting your personal or professional life?
- Find a scholarly, peer-reviewed article on psychological disorders and the brain. Post a link to the article and a brief summary of the article and the author's conclusions.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

Unit 10 >> Selected Topics of Biopsychological Studies

Introduction

Much about what is known about consciousness comes from studying the nature of sleep, and how our brains enter sleep and wake from it. The concept of consciousness has intrigued neurobiologists and philosophers alike. New technology and a greater understanding of the brain have enlivened the debate about the nature of consciousness, and have led to new insights into this once largely inaccessible concept.

In this final unit, you will explore current trends in biopsychology research, such as sleep and consciousness, the sense of pain, and sex and gender. The age of puberty has steadily decreased over the past several decades. Puberty is generally defined as the point at which the brain completes maturation and this process is largely orchestrated by steroid hormones. For some individuals, puberty comes long before the teenage years, prompting questions about environmental and genetic signals that trigger this event. Testosterone is important for normal development and in the maturation of both males and females. In the developing male brain, the bulk of it is aromatized to estrogen. But androgens may also play an important role in shaping sexual preferences and behaviors, particularly in humans. Last, we look at how pain is both a necessary and troubling sensation. Without the sensation of pain, it is difficult to avoid injury, which is required for human survival.

Congratulations for completing this course!

Learning Activities

u10s1 - Studies

Readings

Use your *Brain & Behavior* text to complete the following:

- Read Chapter 11, "The Body Sense and Movement," pages 312–344. In this chapter, you will learn how several brain structures work together to produce movement.
- Read Chapter 15, "Sleep and Consciousness," pages 446–480. In this chapter, the author reviews sleep disorders and what causes them.

Use the Capella library to complete the following:

- Read Koch and Greenfield's 2007 article, "[How Does Consciousness Happen?](#)," from *Scientific American*, volume 297, issue 4, pages 76–83.

Multimedia

- Click **The Biological Sleep Clock** to learn about the role of the suprachiasmatic nucleus in your biological clock.
- Visit the Sage *Brain & Behavior* study site to view the following animation:
 - [Brain Mechanisms of Sleep and Arousal](#) | [Transcript](#).

Optional Resources

If you choose, review the following:

- [Society for Neuroscience](#) website.
- Wallace's 1989 book, *Perspectives on the Coordination of Movement* (Vol. 61).

Course Resources

u10s2 - Biopsychology Time Line

Multimedia

Click **Biological Psychology Time Line** to view the presentation, which illustrates and describes milestones in theory development and theorists involved in this evolving profession.

Johann Herbart (1776–1841) was the first philosopher to predict a boundary or threshold between conscious and unconscious states. Ernst Weber (1795–1878) approached the study of consciousness by measuring the magnitude of a physical stimulus and a subject's sensitivity to changes in that stimulus. He described the exact point at which a subject is able to detect such changes as the "just noticeable difference" threshold. Gustav Fechner (1801–1887) built on Weber's theory to create a psychophysical metric based on the magnitude of a physical stimulus and the intensity of its perception. Helmholtz (1821–1894) continued the study of the physiology of perception and Wundt (1832–1920) established the first experimental laboratory in the United States devoted to the study of psychophysics. In the history of the neural basis of movement, the earliest studies of sensory-motor localization in the cortex were documented by Charles Bell (1774–1842). Johannes Müller (1801–1858) established the law of specific nerve energies in his studies of the psychophysics of sensory information processing. Alexander Bain (1818–1903) also added to early understanding of sensory-motor associations in the brain as did Hughlings Jackson (1835–1911). Gustav Fritsch (1838–1927) and Eduard Hitzig (1838–1907) conducted experiments using electrophysiology to localize motor function in the cerebral cortex. Charles Sherrington (1857–1952) received the Nobel Prize for his law, which depicted the reciprocal process of innervation of reflexive movements. For a contemporary overview of the study of the neural bases of disorders of movements, see Wallace's *Perspectives on the Coordination of Movement*.

Course Resources

Biological Psychology Time Line

u10d1 - Movement and Sleep

Refer to the following resources for help using Yellowdig or understanding how grading in Yellowdig works.

- [Using Yellowdig \[PDF\]](#).
- [Grading in Yellowdig \[PDF\]](#).
- [Yellowdig Forums](#). Capella's Campus support page for Yellowdig, with links for technical support.

Initial Pin

Post something to the discussion board related to the content we are exploring this week. For each post, be succinct, using no more than 75 words. Also feel free to explore the features of Yellowdig, such as the ability to embed videos and pictures, create polls, use hashtags, like or love a post, and so on.

Here are some ideas for your pin (post) to get you started:

- Find a short video or article about body sense and the brain. Share the link to your source and a short summary of the source. Include why you found the resource helpful to your understanding.
- Discuss an area of the body sense and movement in Chapter 11 that stood out to you. Why was this information important to you? Can you see it affecting your personal or professional life?
- Find an article about movement and the brain in the popular press (such as *The New York Times*, CNN, *Psychology Today*). Share a link to your source and a short summary of the source. Discuss why this made the news and why it is important.
- Discuss an area of sleep and consciousness in Chapter 15 that stood out to you. Why did this catch your attention? Can you see this information affecting your personal or professional life?
- Find a video about sleep and the brain. Share the link and a short summary. Also, share what stood out to you the most or surprised you.
- Find a scholarly, peer-reviewed article showing empirical research on sleep and the brain. Post a link to the article and a brief summary of the article and the author's conclusions.

Response Guidelines

As you respond to your classmates, share your experiences and anecdotal feedback regarding their pins. How have your personal experiences resonated with their ideas? What can you add to their ideas, building upon the connections you have made to the material so far?

Course Resources

Psychology Undergraduate Discussion Scoring Guide

u10q1 - Unit 10 Quiz 1

The unit quizzes provide an opportunity for you to demonstrate your mastery of the following course competencies:

- Analyze research methods used in the study of biological psychology.
- Apply psychological theories to topics in biological psychology.
- Apply scholarly research findings to topics in biological psychology.

Be sure to complete the unit readings first. This quiz will test your knowledge of biological psychology. To start the quiz:

- There is no time limit on the quiz once you open it.
- You may access the quiz to preview the questions; however, once your quiz is submitted you cannot retake it to change your grade.
- You must complete this quiz during Unit 10.
- There are 100 total points possible. Each question is worth 5 points.
- Once you submit the quiz, you will receive immediate feedback and a grade.

Click the linked quiz title to access the quiz. If you have any issues with the quiz, contact your instructor.