Subject Details	**Subject title, code and credit hours**	PSYC312, Anatomy and physiology of the central nervous system, 3 KU/6 ECTS
	Departament	Psychology
	Program (bachelor's and master's degree)	Bachelor's
	Associated Term	Spring 2026
	Instructor	Aygun Isgandarova
	E-mail:	isgandarovaaygun@gmail.com
	Telephone:	
	Lecture room/Schedule	
	Consultations	After classes- 30 minute
Prerequisites	-	
Teaching language	English	
Subject type (mandatory/elective)	Mandatory	
Readings	1. Anatomy of the Central Nervous System Textbook for students studying psychology /Dr. Olga V.Grigoryeva ,2014.64 pages. 2. Bear, M. F., Connors, B. W., & Paradiso, M. A. (2020). *Neuroscience: Exploring the brain* (4th ed.). Wolters Kluwer. 3. Blumenfeld, H. (2021). *Neuroanatomy through clinical cases* (3rd ed.). Oxford University Press. 4. Carlson, N. R., & Birkett, M. A. (2021). *Physiology of behavior* (13th ed.). Pearson. 5. Crossman, A. R., & Neary, D. (2015). *Neuroanatomy: An illustrated colour text* (5th ed.). Elsevier. 6. Hall, J. E. (2021). *Guyton and Hall textbook of medical physiology* (14th ed.). Elsevier. 7. Kandel, E. R., Koester, J. D., Mack, S. H., & Siegelbaum, S. A. (2021). *Principles of neural science* (6th ed.). McGraw-Hill. 8. Nolte, J. (2016). *The human brain: An introduction to its functional anatomy* (7th ed.). Elsevier. 9. Snell, R. S. (2019). *Clinical neuroanatomy* (8th ed.). Wolters Kluwer	
Course description	The Anatomy and Physiology of the Central Nervous System course provides a comprehensive overview of the structural and functional organization of the brain and spinal cord. The course introduces the cellular components of the nervous system, including neurons and neuroglial cells, and explains their physiological roles. Emphasis is placed on the development, gross anatomy, and microscopic structure of the central nervous system. Students will examine the functional regions of the brain, including the cerebral cortex, brainstem, cerebellum, and spinal cord. The course explores sensory and motor pathways and their integration within the central nervous system. Fundamental neurophysiological processes such as synaptic transmission, action potentials,	

	and neural communication are discussed. The course also covers autonomic nervous system control and homeostatic regulation. Clinical correlations are introduced to relate anatomical structures to neurological disorders and injuries. Laboratory or visual-based learning may be used to enhance understanding of neuroanatomical organization. Upon completion, students will have a solid foundation for advanced studies in neuroscience and related health sciences.
Course objectives	Upon successful completion of this course, students will be able to: 1. Describe the gross and microscopic anatomy of the central nervous system, including the brain and spinal cord. 2. Explain the structural and functional organization of neurons and neuroglial cells. 3. Identify major regions of the brain and spinal cord and relate their structures to specific functions. 4. Understand the physiological mechanisms underlying neural signaling, including action potentials and synaptic transmission. 5. Analyze sensory and motor pathways within the central nervous system. 6. Explain the integration of information within the central nervous system and its role in behavior and homeostasis. 7. Describe the functional significance of autonomic control systems. 8. Correlate neuroanatomical structures with common neurological disorders and clinical conditions. 9. Interpret basic neuroimaging and anatomical diagrams related to the central nervous system. 10. Apply foundational knowledge of central nervous system anatomy and physiology to advanced studies in neuroscience and health sciences.
Learning outcomes	This course provides students with an understanding of the functional role of the nervous system in providing for the integration of the cells, tissues and organs of the body, and its relationship to the clinical science of chiropractic. Students will be able to: • Identify the major components of the central nervous system distinguishing grey matter from white matter. Understand the basic neural embryological development and neuro histology. • Distinguish between the different meningeal layers and major cranial blood vessels. Understand the blood supply of the brain and the formation and absorption of CSF. • Identify the external and internal structure of telencephalon and diencephalon. Understand the function of the cortex, basal ganglia, thalamus, hypothalamus and pituitary gland. • Describe the connections between the cerebellum and other regions of the CNS and outline the functional relationships.

<table>
<tr><td></td><td colspan="3">Describe the organization of spinal grey matter and white matter and explain the major tracts.
Identify the external and internal structure of the brain stem. Understand the function of each division of the brainstem and each cranial nerve.
Summarize what structures are innervated by each nerve, identifying motor, sensory and parasympathetic innervations.
Define the major clinical manifestations of each cranial nerve injury.
Describe the different lobes of the cerebrum, sulci and gyri on the different surfaces of the cerebral hemisphere.</td></tr>
<tr><td rowspan="4">Teaching methods</td><td>Lecture</td><td colspan="2">+</td></tr>
<tr><td>Group discussions</td><td colspan="2">+</td></tr>
<tr><td>Activities</td><td colspan="2">+</td></tr>
<tr><td>Analysis of activities</td><td colspan="2">+</td></tr>
<tr><td rowspan="6">Assessment and Grading</td><td>Components</td><td>Deadlines</td><td>Percentage</td></tr>
<tr><td>Mid Term exam</td><td>Week 8</td><td>30</td></tr>
<tr><td>Being an active member of learning community</td><td>During semester</td><td>10</td></tr>
<tr><td>Assignment and Test</td><td>Week 15</td><td>10</td></tr>
<tr><td>Presentation/Group discussion</td><td>Weeks 5-14</td><td>10</td></tr>
<tr><td>Final exam</td><td>At the end of semester</td><td>40</td></tr>
<tr><td>Classroom Policy</td><td colspan="3">• Participation
Be well-prepared for classes, engage actively during discussions, and ask relevant questions related to the topic. It's important to make logical comments and respect the views of others in the group. Avoid interrupting others, listen attentively, and contribute thoughtfully to the conversation.
• Individual Work and Presentation
Presentations should align with interactive learning approaches and be grounded in research. Key aspects evaluated include how information is delivered, the structure of the presentation, audience engagement, and references to current literature. Presentations may be done individually.
Individual Work Grading Criteria
• Presentation
The presenter should maintain good eye contact with the audience and be lively (e.g., using gestures or moving around). They must speak clearly and audibly, with good language skills and pronunciation. Visual aids should be informative, well-designed, and not distracting. The presentation should stay within the allotted time, and the information should be effectively communicated.

We want to build a classroom climate that is safe for all. It is important that we
1) display respect for all members of the classroom – including the instructor</td></tr>
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	and students. 2) pay attention to and participate in all class sessions and activities. 3) avoid unnecessary disruption during class time (e.g. having private conversations, reading the newspaper, surfing the Internet, doing work for other classes, making/receiving phone calls, text messaging, etc.); and 4) avoid racist, sexist, homophobic, or other negative language that may unnecessarily exclude members of our campus and classroom. This is not an exhaustive list of behaviors; rather, it represents examples of the types of things that can have a dramatic impact on the class environment.

Week	Topics	Readings/Assignments due
1.	Anatomy of the brain	MayfieldClinic.com
2.	Anatomy of the Central Nervous System(CNS)	2006 Pearson Education, Inc., published as Benjamin Cummings page 344-379
3.	Function of the Central Nervous System(CNS)	Anatomy& Physiology.Multi-part Textbook Equity edition retains original academic content as published by Openstax College,and under the terms of their Creative Commons license(CC-BY)2013 Chapter 1
4.	Somatosensory System	Fundamental neuroscience third edition Larry Squire(VA Medical Center San Diego, California University of California, San Diego, La Jolla, California) Darwin Berg (University of California, San Diego La Jolla, California),Floyd Bloom (The Scripps Research Institute La Jolla, California),Sascha du Lac (The Salk Institute La Jolla, California), Anirvan Ghosh (University of California, San Diego La Jolla, California), Nicholas Spitzer (University of California, San Diego La Jolla, California 2008, 581-609 pages
5.	Audition. Presentation	Fundamental neuroscience third editionLarry Squire (VA Medical Center San Diego, California University of California, San Diego, La Jolla, California) Darwin Berg (University of California, San Diego La Jolla, California),Floyd Bloom (The Scripps Research Institute La Jolla, California),Sascha du Lac (The Salk Institute La Jolla, California), Anirvan Ghosh (University of California, San Diego La Jolla, California), Nicholas Spitzer (University of California, San Diego La Jolla, California 2008, 609—637 pages

6.	Vision	Fundamental neuroscience third edition Larry Squire (VA Medical Center San Diego, California University of California, San Diego, La Jolla, California) Darwin Berg (University of California, San Diego La Jolla, California),Floyd Bloom (The Scripps Research Institute La Jolla, California),Sascha du Lac (The Salk Institute La Jolla, California), Anirvan Ghosh (University of California, San Diego La Jolla, California), Nicholas Spitzer (University of California, San Diego La Jolla, California 2008, 637-663 pages
7.	Organization of spinal cord, spinal nerves and spinal reflexes	Kandel ER. Principles of Neural Science. 5th ed. 2013 Waxman S. Clinical Neuroanatomy. 27th ed. 2013 Chapter 4
8.	**Midterm Exam**	
9.	Fundamentals of Motor Systems, Cerebellum	Fundamental neuroscience third edition Larry Squire (VA Medical Center San Diego, California University of California, San Diego, La Jolla, California) Darwin Berg (University of California, San Diego La Jolla, California),Floyd Bloom (The Scripps Research Institute La Jolla, California),Sascha du Lac (The Salk Institute La Jolla, California), Anirvan Ghosh (University of California, San Diego La Jolla, California), Nicholas Spitzer (University of California, San Diego La Jolla, California 2008, 663-677 pages, 751-775 pages
10.	The Hypothalamus: An Overview of Regulatory Systems	Fundamental neuroscience third edition Larry Squire (VA Medical Center San Diego, California University of California, San Diego, La Jolla, California) Darwin Berg (Diego La Jolla, California2008, 795-807 pages
11.	Sleep, Dreaming, and Wakefulness	Fundamental neuroscience third edition Larry Squire (VA Medical Center San Diego, California University of California, San Diego, La Jolla, California) Darwin Berg (University of California, 2008, 959-987 pages
12.	Epilepsy-Seizure	
13.	Stroke: Ischemic and Hemorrhagic	The Stroke Recovery Book. *A Guide for Patients and Families* Second Edition. Kip Burkman, M.D. 2011 Chapter 2

14.	Types and Levels of Brain Injury	National Institute of Neurological Disorders and Stroke. Traumatic brain injury: hope through research. Bethesda (MD): National Institutes of Health; 2002 Feb. NIH Publication No.: 02-158 Page 544-576
15.	Quiz and presentations	
16.	Parkinson's Disease	Recovery from Parkinson's,Dr.Janice Walton-Hadloc, Daom 2013.*Chapter 3*
	Final exam	