Program	BS (4 Years)	Course Code	APSY-475	Credit Hours	3
Course Title	Biological Basis of Behavior				

Course Introduction

Biological Basis of Behavior is an advanced course in psychology that concerns with the relationship between the nervous system and behaviour. The goal of this course is to describe how psychological functioning is implemented in the nervous system. In this course, students will gain basic knowledge of the nervous system, be able to map psychological experience of both basic and complex behaviour underlying brain structure and neurotransmission, learn how the brain relies on chemicals and how subtle imbalance can result in psychiatric illness.

Learning Outcomes

On the completion of the course, the students will be able to:

1. The student will possess a good understanding of structure and function of brain, different parts of nervous system, neurochemistry, hormones.
2. The students will be able to understand the link between biological factors underlying human behavior and disorders.
3. It is designed to be an introductory course focusing on the relationship between the nervous system and behavior.

Course Contents

Introduction
Brief historical background, Current trends in the field of Behavioral neuroscience
Contribution of various areas and related disciplines

Structure and Function of Nervous System
Neurons and Glial cells: The neuron**:** neuronal characteristics, types, transmission and communication systems; Neuro anatomical directional terms and planes of reference
Structures of Nervous System, their functions and connections

Methods of studying the nervous system
Neurophysiological and Behavioral research methods of biopsychology

Glands
Endocrine glands: type, functions and effects of hormones as produced by various glands in human body

The central nervous system
Fore brain, mid brain, hind brain; Spinal cord, peripheral nervous system; Autonomic nervous system

Brain Damage & Neurological Disorders: Causes of brain damage: CVA, Head injury, Infections; Psychological implications of brain damage; Cerebrovascular Disorders, Tumors; Parkinson, Alzheimer, dementia, Epilepsy, Cerebral Palsy, Multiple Sclerosis etc. Chromosomal abnormalities; Psychiatric disorders with organic/ biochemical etiology: Mood Disorder, Anxiety Disorders, and Schizophrenia, Mental Retardation.

Neurochemistry
Characteristics of neurotransmitters, neuromodulators and neuro-Hormones; Major neurotransmitters; Dopamine; Nor epinephrine; Serotonin; Acetylcholine; GABA
Glycine; Peptides (opiates); Introduction to Psychopharmacology

Brain and Behaviour

Motivation and Emotions
Homeostasis; Involvement of brain and neurotransmitters in motivational behavior
Aggression; Sleep and circadian rhythms (types and basic function); Injestive behaviors: eating and drinking.
Emotions: Hormonal changes in emotion; Involvement of brain regions and neurotransmitters in emotions

Learning, Memory and Amnesia
Involvement of brain regions and neurotransmitters in learning and memory; Memory disorders (Korsakov, Alzheimer's, Parkinson diseases etc)

Neurophysiology of Speech
Factors in the development of speech; brain regions involved in speech; Speech abnormalities and speech disorders

Neurophysiology of Addiction

Textbooks and Reading Material

2.1 Books

- Beatty, J. (2000). *The human brain-essentials of behavioral neuroscience.* University of California: Sage Publications, Inc.
- Beaumont, G. (1990). Understanding Neuropsychology, OUP.
- Carlson, N. R. (2005). *Foundation of physiological psychology* (6th ed.). UK: Allyn and Bacon.
- Greenwood. (1997). *Neuro-psychological rehabilitation*, USA: Psychology Press.
- Kalat, J. W. (2001). *Biological psychology* (7th ed.).USA: Woodsworth.
- Pinel, J. (1997). Bio-Psychology, 3rd Edition, Allyn& Bacon.
- Pinel, J. P. (2006). *Biopsychology* (6th ed.). UK: Allyn and Bacon.
- Smock, T. (1999). *Physiological psychology*. USA: Prentice-Hall.
- Squire, L. (1990).Neuropsychology of Memory, Guilford Press, USA.
- Watson, N.V.et al (2007).*Biological psychology*. (5th ed.). UK: Sinaver Associates.
- Wilson, B. (1999). *Neuropsychological rehabilitation*. UK: Oxford University Press.

2.2 Journal Articles/ Reports

- Espay, A. J., Aybek, S., Carson, A., Edwards, M. J., Goldstein, L. H., Hallett, M., ... & Morgante, F. (2018). Current concepts in diagnosis and treatment of functional neurological disorders. *JAMA neurology*, *75*(9), 1132-1141.
- Keynejad, R. C., Frodl, T., Kanaan, R., Pariante, C., Reuber, M., & Nicholson, T. R. (2019). Stress and functional neurological disorders: mechanistic insights. *Journal of Neurology, Neurosurgery & Psychiatry*, *90*(7), 813-821.
- Kirkland, A. E., Sarlo, G. L., & Holton, K. F. (2018). The role of magnesium in neurological disorders. *Nutrients*, *10*(6), 730.
- Liang, S., Wu, X., & Jin, F. (2018). Gut-brain psychology: rethinking psychology from the microbiota–gut–brain axis. *Frontiers in integrative neuroscience*, *12*, 33.
- Monje, M. (2018). Myelin plasticity and nervous system function. *Annual review of neuroscience*, *41*, 61-76.
- Wagner, N. J., & Waller, R. (2020). Leveraging parasympathetic nervous system activity to

study risk for psychopathology: The special case of callous-unemotional traits. *Neuroscience & Biobehavioral Reviews*.

Note:- It is preferable to use latest available editions of books.

Teaching Learning Strategies

1. Lectures/Tutorials
2. Semester work
3. Class participation /Presentation
4. Assignments/Class Projects
5. Quizzes

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.