

**Programme: M.Sc. (Biochemistry)**

**Course Code: BCO 102**

**Title of the Course: NEUROCHEMISTRY**

**Number of Credits: 2**

**Effective from Academic Year: 2018-19**

<b>Prerequisites</b>	Basic knowledge on biomolecules and human body.	
<b>Objective:</b>	To develop a basic understanding of structure and organization of nervous system, sense organs and their functions.	
<b>Content:</b>		
<b>1.</b>		<b>(12)</b>
<b>1.1</b>	Organization of Nervous system, CNS, ANS, PNS, Blood Brain Barrier.	
<b>1.2</b>	Nerve, neuron, glial cells and synapse structure.	
<b>1.3</b>	CSF composition, function and circulation	
<b>1.4</b>	Biochemical composition of Nerve tissue. Carbohydrates, lipid and amino acid	
<b>1.5</b>	Transport of amino acid, protein, nucleic acid metabolites.	
<b>1.6</b>	Energy metabolism in Brain	
<b>1.7</b>	Transmission across the synapse, membrane potential in steady state, Action potential generation and propagation, pre and post synaptic events	
<b>1.8</b>	Synaptic transmission	
<b>2.</b>		<b>(12)</b>
<b>2.1</b>	Neurotransmitters, neuromodulators, neuropeptide turnover, metabolism regulation	
<b>2.2</b>	Types of neurotransmitter receptors, receptor- effector mechanisms, properties of Cholinergic receptor, acetylcholine receptors, acetylcholine esterase, Nicotinic receptors, Glutamate receptors, GABA and Glycine receptors, Catecholamine receptors, monoamine oxidase inhibitors. Serotonin receptors, antagonists and re-uptake inhibitors, properties. Nitric oxide in cells.	
<b>2.3</b>	Sensory modalities and sensory circuits, sensory perception of taste, vision, odor, hearing and touch.	
<b>2.4</b>	Biochemistry of memory	
<b>2.6</b>	Biochemistry of mental and neurodegenerative disease, Depression, Schizophrenia, Alzheimer's disease, Huntington's disease, senile dementia. Movement disorders, Parkinson's disease.	
<b>2.7</b>	CNS active drugs, their classification and mode of action. Conventional antipsychotics. Anxiolytics, Antidepressants.	
<b>2.8</b>	Drugs of abuse and their mechanism of action: morphine, alcohol	

<b>Pedagogy:</b>	Lectures/ tutorials/ assignments/ students' seminars/ interactive learning/ self-study.	
<b>References/ Readings</b>	Siegel, G. J., Agranoff, B. W., Albers, W. S., Fisher, K. & Uhler, M. D., Basic Neurochemistry	
	Brunton, L., Chabner, B. & Knollman, B., Goodman and Gilman's, The Pharmacological Basis of Therapeutics.	
	Smith, C.U.M., Elements of Molecular Neurobiology.	
	Kandel, E. Schwartz, J., & Jessell, T., Principles of Neural Science.	
<b>Learning Outcomes</b>	At the end of the course the students will have an in-depth knowledge and understanding about the basic organization of nervous system in humans and the basic functions along with the biochemistry of different diseases related to nervous system and their treatments.	