

	Mahatma Gandhi University Kottayam
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Programme	BSc (Honours) ZOOLOGY					
Course Name	BIOLOGICAL BASIS OF BEHAVIOUR-I					
Type of Course	DSC B (For those who are opting BEHAVIORAL BIOLOGY as Minor)					
Course Code	MG1DSCZGY101					
Course Level	100					
Course Summary	<p>This course provides a comprehensive exploration of the foundational aspects connecting biology to the study of behaviour. Beginning with an overview of natural selection & the evolution of the human species, including the development of large brains, students delve into the ethical considerations surrounding research with human & nonhuman subjects. Encompasses a detailed study of the cells of the nervous system, its structure, membrane potential dynamics & the role of neurotransmitters in impulse transmission. Provides a nuanced understanding of the basic features of central and peripheral nervous system. The course incorporates activity-based studies on various neurological disorders- tumors, seizure disorders, cerebrovascular accidents & degenerative disorders like Parkinson's & Alzheimer's disease.</p>					
Semester	I	Credits			4	Total Hours
Course Details	Learning Approach	Lecture	Tutorial	Practical	Others	
		3	--	1	--	75
Pre-requisites, if any	MGU - UGP					

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COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains *	PO No
1	Understand the biological roots of behaviour, gaining insights into the intricate relationship between the nervous system and behavior	U	1
2	Create a responsible and informed approach to the ethical challenges inherent in studying the physiological aspects of behaviour.	C	6, 8
3	analyze and explain the intricate components of the nervous system.	U, An	2

4	Appraise the complexity and specialization within the brain, laying the foundation for advanced studies in neurological basis of behaviour.	Ap	10
5	Develop a mastery of knowledge by accurately identifying and describing the characteristics, causes, and symptoms of diverse neurological conditions	C	7
6	Evaluate the significance of this knowledge in the context of research, diagnosis, and potential therapeutic interventions for neurological condition	E	7, 9
*Remember(K), Understand(U), Apply(A), Analyze(An), Evaluate(E), Create (C), Skill(S), Interest (I) and Appreciation (Ap)			

COURSE CONTENT

Content for Classroom transaction (Units)

Module	Units	Course description	Hrs	CO No.
1		Biological Underpinnings of Behaviour	6	
	1.1	Biological roots of Behaviour-an introduction	1	1
	1.2	Natural selection and evolution: Evolution of human species, evolution of large brains.	2	
	1.3	Human and nonhuman subjects in in physiological psychology. Ethical issues in research with animals. Careers in neuroscience	3	
2		Foundations of Neural Communication	19	
	2.1	Cells of the Nervous System-Neurons, Structure of neuron, External, internal and supporting structures, types of neurons.	8	2
	2.2	Maintenance of Membrane potential, resting potential, depolarization, hyper polarization, action potential	7	
	2.3	Neurotransmitters- Role of neurotransmitters in transmission of impulses. Excitatory and inhibitory post synaptic potentials	4	
3		Anatomy and Functionality of the Nervous System: From Central to Peripheral Structures	20	
	3.1	Basic feature of the Nervous System. Central Nervous system, Forebrain, Midbrain and hindbrain, Hypothalamus, Cortex, Spinal cord.	9	3,4
	3.2	The Peripheral Nervous System: Spinal nerves, cranial nerves, the autonomic nervous system.	5	
	3.3	Structure of neocortex, capabilities of the right & left hemispheres.	6	

4		Practical	30	
	1	Brain evolution order in reference to human evolution – based on diagram arrange in chronological order and comment		1
	2	Identify & comment on different types of Neurons		2
	3	Identify, Sketch and label parts of Neuron		
	4	Conduction of action potential – Using Physioex (Use of PhysioEX 9.0 : Laboratory Simulations in Physiology by P.Zao.,T.Stabler., L.A.Smith and E .Griff. 2011 for nerve physiology practical)		3,4
	5	Identification of different parts of brain and comment on functions– forebrain, midbrain and hindbrain – using diagram/model		
	6	Identify and comment on different parts in limbic system– Using diagram/model		
	7	Identification of different parts of Spinal cord (Filum terminale and cross-section)		
	8	Identification of Selected Cranial nerves		
5.		Teacher Specific Module		

EVALUATION AND ASSESSMENT

Teaching and Learning Approach	Classroom Procedure (Mode of transaction) Interactive Lectures and Discussions, Group discussions to explore evolutionary principles, ethical considerations, and the broader implications of physiological psychology, Case Studies and Real-world Examples, Guest Speakers and invited talks, Activities and Seminars, Technology Integration: Utilize multimedia resources, virtual models, and interactive platforms to enhance visual understanding of complex physiological processes.
Assessment Types	<p>MODE OF ASSESSMENT</p> <p>A. Continuous Comprehensive Assessment (CCA) Theory Total=25 marks Quiz/Test Papers/Report on Case Studies & Real-world Examples/Report of invited talks/Seminar/Workshop/Conference Practical Total = 15 marks Lab performance/record/ Test paper</p> <p>B. End Semester Examination Theory Total =- 50 marks, Duration 1.5 hrs Short Essays 5 out of 7 x4=20 marks Short questions 10 out of 12 x 2 =20 marks Fill in the blanks - 5x1 =5 marks; MCQ - 5x1 = 5 marks</p> <p>Practicals - Total = 35 marks; Duration- 2 hrs Record - 10 marks, Examination - 25 marks:</p>

	<ol style="list-style-type: none"> 1. Identify, arrange in chronological order & comment on brain evolution - 6 Marks 2. Sketch and label the parts of a neuron - 4 Marks 3. Identify and comment on the given type of neuron/ any one part of the forebrain, midbrain, hindbrain or part of limbic system - 4 Marks 4. Identification of a Cranial nerve/ two parts of Spinal cord from the C.S of Spinal cord given – 4 Marks 5. Demonstrate the conduction of action potential using Physio Ex software – 7 Marks
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REFERENCES

1. Carlson.R.N. (2017). Foundations of Physiological Psychology (6th Ed.). New Delhi, Pearson Education, Inc
2. Gerard J. Tortora (2017). Principles of Anatomy and Physiology (14th Edition), John Wiley & Sons.Inc
3. Guyton, A. Medical Physiology (8th ed.), W. B. Saunders' Co.
4. Kalat, J.W. (2018). Biological psychology. Cengage
5. Kenneth.S. Saladin (2011), Anatomy and Physiology (Sixth edition), McGraw–Hill Primis
6. Pinel, J.P. (2007). Biopsychology. India: Dorling Kindersley Pvt. Ltd

SUGGESTED READINGS

7. Bear Mark F.(2016) Neuroscience Exploring the brain (4th Ed.), Wolters Kluwer.
8. Rosensweig, M.R., Breedlove, S. M., & Watson, N. V. (2004). Biological Psychology, (4thed.).USA: Sinauer Associates, Inc

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