

## **M.Sc. (Neuropsychology)**

### **Programme Outcomes (POs)**

PO1. Advanced Knowledge: Demonstrate and apply the fundamental knowledge of the basic principles in respective field of sciences.

PO2. Critical thinking: Function competently in laboratory setting, design and conduct experiments and simulations, as well as critically analyzing the results and interpret them.

PO3. Scientific Outlook: Develop a research culture and implementation of the policies to tackle the burning issues at global level and enhance the scientific temper.

PO4. Skills & Responsibility: Inculcate logical thinking to address a problem and become result oriented with a positive attitude.

PO5. Creative Thinking: Analyse and apply appropriate tools & techniques for decision making and problem solving.

PO6. Value-based Leadership: Develop personal strengths like emphasising perseverance, building negotiation skills and communication skills as a team member or team leader.

PO7. Ethics: Understand professional and ethical responsibility while carrying out research and design activities.

PO8. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

## **Programme Specific Outcomes (PSOs)**

PSO1. Develop knowledge in theory, research and application of psychology in clinical/Neuropsychological settings

PSO2. Enhance practical exposure through internship and field visits in the application of neuropsychological principles learnt from a theoretical perspective.

PSO3. Describe and analyse various neurocognitive development stages and its applicability. This can include case studies, simulations, or projects that require students to demonstrate leadership qualities.

PSO4. Develop analytical thinking and quality research vigour by kindling their interests in conducting research and dissertation in psychology. Commence steps for lifelong learning by participating in workshops, conferences, and seminars to stay updated on the latest advancements in the field.

PSO5. Develop a mindset of integrating other avenues of psychology and life sciences into the neuropsychological understanding to lead to a culmination of student's understanding of the human body, brain, mind in a more holistic manner.

## Course Outcomes (COs)

### Semester I

Subject Name	Course Outcomes
FUNDAMENTALS OF NEUROSCIENCE AND NEUROPSYCHOLOGY	<p>CO1 - Remember and understand fundamental knowledge of the brain areas and their working and integration.</p> <p>CO2 - Understand the role of neural functioning with cognitive processes.</p> <p>CO3 - Evaluate the role of the brain as a command centre for all autonomous and voluntary functions of the body.</p> <p>CO4 - Analyze the key roles of the brain in processing the external and internal environment and its implications in research.</p> <p>CO5 - Building a holistic understanding of the mind and the body and its implications in research.</p>
COGNITIVE AND NEUROLOGICAL DEVELOPMENT	<p>CO1-Remember and understand the evolution of human brain at all developmental level.</p> <p>CO2 - Remember and understand how different structural and functional changes occur in human nervous system throughout life.</p> <p>CO3-Understand different theories of cognitive development and analogical reasoning, and apply the understanding in figuring out real life application in cognitively compromised individuals.</p> <p>CO4-Compare and contrast between the different perspectives of understanding human intelligence.</p> <p>CO5-Understand the different structure of language and associated brain areas; analyze the findings to help formulate provisional diagnosis for individuals with compromised language ability.</p>
PSYCHOMETRY, RESEARCH, AND STATISTICS IN NEUROPSYCHOLOGY	<p>CO1-Examine the various methods, scope and nature of Neuropsychology.</p> <p>CO2-Differentiating the use of single case study and multiple case studies along with types of research exploratory and hypothesis driven.</p>

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	<p>CO3-Understand the connectionism model in the area of neuropsychology and examine new developments including artificial neural networks.</p> <p>CO4-Understand the statistical methods of analyzing research. Apply that to the neuropsychological field.</p> <p>CO5-Examine various methods of studying the central nervous system and compare the efficiency.</p>
<p>NEUROCOGNITION OF LANGUAGE</p>	<p>CO1-Gain Foundational Knowledge in Language studies and Event-Related Potentials.</p> <p>CO2-Gain Foundational Knowledge in the base aspects of language including Phonemes, graphemes, syntax, semantics, and lexicons.</p> <p>CO3-Analyse and interpret the research on Auditory Sentence Processing and study its application in emotional voice.</p> <p>CO4-Analyse the brain processing of language in Monolinguals and Bilinguals.</p> <p>CO5-Interpret the real word use of language in advertising and also analyse the correlation between personality and language.</p>
<p>METHODS IN COGNITIVE NEUROSCIENCE</p>	<p>CO1-Understanding the fundamentals of the methods of brain imaging used in neuroscience.</p> <p>CO2-Understanding the neuroimaging techniques of Eye-tracking, Electroencephalography, Transcranial magnetic stimulation, Transcranial direct current stimulation, Magnetic resonance imaging, Positron emission tomography, and Magnetoencephalography.</p> <p>CO3-To analyse each imaging method and realise which method is best suited for a specific localised region of the brain and for a specific diagnosis for disorder.</p> <p>CO4-To interpret the therapeutic implications of various neuromodulation methods.</p> <p>CO5-To analyze the integrative use of neuroimaging and neuromodulation in research purposes to discover and understand more of the brain.</p>

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PSYCHOMETRIC ASSESSMENTS	CO1: To have practical knowledge of various neurocognitive tests. CO2: To have a hand on experience in sub-test analysis for individual differences. CO3: To be able to apply the knowledge of cognitive deficits in relation to motor deficits. CO4: To be able to interpret the findings of neurocognitive tests in real life settings.

## Semester II

Subject Name	Course Outcomes
DSE1: INTRODUCTION TO SPORTS PSYCHOLOGY  DSE2: STRESS AND HEALTH	CO1-To introduce the student to the world of sports psychology. CO2-To help students understand and integrate the psychological concepts of motivation, emotion and personality in the sports field. CO1-To explore the links between the functioning of the mind, body and culture. CO2-To help students understand the techniques and approaches to effective management of stress.
NEUROANATOMY AND MENTAL DISORDERS	CO1-Understanding the difference in neurological anatomy in neurotypicals and disorders. CO2-Understanding and analysing the neuroanatomy for each of the major functions that are impaired by mental disorders. CO3-Analysing the neurobiological imbalance caused due to consciousness and memory related disorders. CO4-Analysing the neurobiological imbalance caused due to anxiety and sleep related disorders. CO5-Analysing the neurobiological imbalance caused due to impulse control and personality disorders.
REHABILITATION PSYCHOLOGY	CO1-To familiarize students with basic concepts, strategies, and techniques of rehabilitation psychology.

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	<p>CO2-To familiarize students with types and characteristics of various disabilities.</p> <p>CO3-To introduce students to Govt. Schemes and policies for disabled individuals and their families in India are set up.</p>
<p>PROFESSIONAL ETHICS AND ISSUES</p>	<p>CO1-Understand the foundational principles of ethics in neuropsychology.</p> <p>CO2-Analyze and resolve common ethical dilemmas in research and practice.</p> <p>CO3-Examine ethical issues specific to a special population.</p> <p>CO4-Develop a personal ethical decision model.</p> <p>CO5-Understand legal aspects of licensure and practice of Neuropsychology in India.</p>
<p>NEUROPSYCHOLOGICAL INTERVENTION PRACTICAL</p>	<p>CO1: To acquire the practical knowledge of personality's influence in neurocognitive outlooks.</p> <p>CO2: To acquire advanced knowledge and skills in integrating inferences from emotional states to neurocognitive natures.</p> <p>CO3: To develop the ability to critically analyze and draw inferences from item analysis in paper-pencil tests.</p> <p>CO4: To acquire the practical knowledge of integrating neurocognition, emotion, and personality to draw in-depth inferences about individuals.</p>

### Semester III

Subject Name	Course Outcomes
PSYCHOPHARMACOLOGY	<p>CO1: Demonstrate knowledge of the biochemical basis of the neuronal impulse.</p> <p>CO2: Demonstrate knowledge of the various classes of psychopharmacological agents</p> <p>CO3: Demonstrate knowledge of various brain circuits involved in psychological symptomatology.</p> <p>CO4: Demonstrate knowledge of the biochemical theories underlying schizophrenia, mood disorders and anxiety disorders.</p> <p>CO5: Demonstrate knowledge of the proprietary names, mechanisms of action, therapeutic Indications, and side effects of a wide array of psychopharmacological agents.</p>
SPECIAL TOPICS IN PERCEPTION AND COGNITION	<p>CO1 - Demonstrate understanding of the relationship between Social Cognition, Perception, and Action in the context of Joint Action.</p> <p>CO2 - Explain the concept of Visuomotor adaptation and apply the knowledge of Temporal Delay recalibration to analyze and address challenges in dealing with temporal delays in continuous movements.</p> <p>CO3 - Examine the role of Bottom-up/Top-down perception and Saliency map models and infer on Fixation control in realistic search tasks to predict and analyze eye movement patterns in various scenarios.</p> <p>CO4 - Understand the concept of Configural Coding and its role in visual illusions and use the knowledge of Configural Processing to analyze and interpret the effects of lighting on visual illusions.</p> <p>CO5 - Analyze the impact of Presence in VR experiences and evaluate how it influences participant behavior and responses in psychological studies.</p>
NEURO-PSYCHOPATHOLOGY	<p>CO1: Identify and describe various perception disorders, including sensory distortions and changes in quality.</p> <p>CO2: Explain the concept of sensory deceptions, such as illusions and hallucinations.</p>

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	<p>CO3: Analyse different disorders of thought and speech, including disorders of content and form of thinking.</p> <p>CO4: Make value-based judgments of the impact of memory disorders, such as amnesias and distortion of memories.</p> <p>CO5: Examine the classification and characteristics of emotional disorders.</p> <p>CO6: Apply knowledge of motor disorders, including adaptive and non-adaptive movements.</p>
<p>READING DEVELOPMENT AND DYSLEXIA</p>	<p>CO1: Understand the various different writing systems in existence around the world, and the stages of learning to read.</p> <p>CO2: Analyse the classification of dyslexia and hyperlexia, and the different types of neurological impairments involved.</p> <p>CO3: Understand the mechanisms of surface dyslexia, and the dual route model in dyslexia.</p> <p>CO4: Evaluate the relationship between transparent orthographies and dyslexia.</p> <p>CO5: Analyse the biological and genetic influences on dyslexia.</p>
<p>NEURO-EXPERIMENTAL PSYCHOLOGY - 1</p>	<p>CO1: Demonstrate proficiency in administering and interpreting the Quick Neurological Screening Test (QNST), Test of Information Processing Skills (TIPS), and utilizing Cognitstat for comprehensive cognitive assessments.</p> <p>CO2: Develop the ability to critically analyze and synthesize data from QNST, TIPS, and Cognitstat, deriving comprehensive insights into neurological and cognitive functioning.</p> <p>CO3: Apply ethical principles in the administration, interpretation, and reporting of cognitive assessments, considering cultural sensitivity and confidentiality.</p> <p>CO4: Construct clear, concise reports based on assessment findings, fostering effective communication with healthcare professionals and clients.</p>



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	CO5: Connect assessment results to potential intervention strategies, demonstrating the application of findings for educational, clinical, or rehabilitation purposes.

### Semester IV

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NEUROLOGICAL BASIS OF BEHAVIOUR	<p>CO1: Demonstrate comprehensive understanding of the evolutionary and genetic basis of behavior, neural development, and the interplay between genes and experience.</p> <p>CO2: Apply neurobiological concepts to analyze the organization of the nervous system, neuron functioning, and brain region specialization, integrating Nature/Nurture perspectives to design behavioural neuroscience studies.</p> <p>CO3: Integrate approaches relating mind and brain/body, understanding the bidirectional relationship between psychological and neural processes.</p> <p>CO4: Analyze Behavioral Neuroscience in learning and memory, understand hippocampal neural patterns, and apply knowledge of memory reconsolidation for human decision-making.</p> <p>CO5: Understand advanced neurohistology, radiological, electrophysiological, and imaging techniques for brain investigation.</p>
NEURO-ASSESSMENT	<p>CO1: Demonstrate a comprehensive understanding of the concepts in neuropsychological assessment, tracing the historical development of neuropsychology laboratories and the evolution of neuropsychological batteries.</p> <p>CO2: Acquire in-depth knowledge of clinical, cellular, and molecular mechanisms underlying various neurological diseases, and neuropsychiatric disorders, and analyse the application of neuroimaging techniques in neuroscience.</p> <p>CO3: Analyse the nature of neuropsychological assessment and become familiar with prominent neuropsychological tests and</p>

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	<p>batteries and demonstrate the ability to select appropriate tools based on specific assessment needs.</p> <p>CO4: Learn to interpret neuropsychological assessment data, applying various approaches to assess performance levels, measure deficits, and identify qualitative observations for accurate diagnosis.</p>
<p>NEURO-PSYCHOLOGICAL INTERVENTION</p>	<p>CO1: Develop a comprehensive understanding of various mental disorders, including anxiety, adaptation, stress-related, dissociative, and somatic symptom disorders in relation to each other.</p> <p>CO2: Master the fundamentals of neuropsychological therapies, including neuroplasticity, neurofeedback, computer-based brain retraining programs, and biofeedback.</p> <p>CO3: Differentiate between clinical and neuropsychological therapies and explore the future advancements and advantages of these therapies in managing various conditions like mental retardation and brain damage.</p> <p>CO4: Apply Luria's theory to the rehabilitation process of brain damage and explore various intervention models in neuropsychology.</p> <p>CO5: Gain skills in managing communication deficits in traumatic brain injury patients, memory remediation, and learn from failures in perceptual-cognitive retraining in stroke cases.</p>
<p>NEURO-EXPERIMENTAL PSYCHOLOGY - 2</p>	<p>CO1: Develop expertise in administering and interpreting the SPANS, gaining proficiency in assessing the severity of dementia and understanding its implications for cognitive functioning.</p> <p>CO2: Demonstrate competence in using the Stroop Neuropsychological Screening Test (SNST), applying its principles to assess attention, cognitive flexibility, and processing speed in various clinical contexts.</p> <p>CO3: Gain proficiency in administering and interpreting the Wisconsin Card Sorting Test -64 (WCST-64) Card Version, acquiring skills in assessing executive functions, cognitive flexibility, and problem-solving abilities.</p> <p>CO4: Apply cognitive strategies and techniques provided by Brainwave R for brain injury rehabilitation, developing the ability</p>

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	<p>to tailor interventions to specific cognitive challenges resulting from brain injuries.</p> <p>CO5: Integrate knowledge from the SPANS, SNST, WCST-64, and Brainwave R to form a holistic understanding of cognitive functioning. Will learn to select and apply appropriate assessment tools based on the unique needs and challenges of individuals with cognitive impairments.</p>