

School of Studies in Neuroscience Jiwaji University, Gwalior

The Master's program in Neuroscience was introduced in the year 2000. This is being the first such program in any Indian University or research centre. The major goal of the program is to impart quality teaching and training to the students on various aspects of Brain structure and functions and develop trained manpower having a broad overview of the different aspects of neuroscience. The passed out students would have acquired the basic knowledge in major disciplines of neuroscience, such as neuroanatomy, neuropathology, neurophysiology, neurochemistry, molecular neurobiology, neurogenetics, cognitive neuroscience and the knowledge of working of motor, sensory and regulatory systems. The development and regeneration of the brain as well as the knowledge in basics of clinical neuroscience in terms of diseases and diagnostic tools would also be provided. The department has been fully supported by DBT, Govt. of India since beginning. The department has received extra mural research grants from various Govt. funding agencies (DBT, DST, ICMR, DRDO, etc.) to work upon various pathological aspects of brain, including brain aging, neurodegenerative diseases, malnutrition and cognition, etc. These research and developmental grants have helped develop the departmental teaching and research facility to an advance level, comparable to any national level teaching department. The department is running programs in

Master of Science (M.Sc.)

Doctor of Philosophy (Ph.D.)

Programme Outcomes (POs)

The purpose of inducting M. Sc. program in Neuroscience at the University was to provide students Theoretical and Practical knowledge in various areas of neuroscience to help them build-up strong carrier in biomedical science. The faculty members are putting all efforts to fulfil the requirement of students of this course.

The major objectives of the department are as follows:

1. To bring innovation and excellence in teaching and research in the area of neuroscience.
2. To organize community health services to screen and diagnose the various pathological conditions arising out of genetic, social or environmental issues, supporting the therapeutic strategies to be adopted at specialized hospitals/clinical centres.
3. To generate possible employment opportunities for the students.

4. To train the students in various tools and techniques applied in neuroscience to develop expertise in them for advance research in neuroscience and professionalism.

Programme Specific Outcomes (PSOs)

The course curriculum of Neuroscience has been designed to prepare the Master's students to attend the following program specific outcomes.

PSO1. The ability to understand and interpret the various cellular, biochemical, molecular and genetic principles related to the fundamental structure and functions of brain cells or neurons.

PSO2. To apply the skill developed during the studies in their future teaching and research activities and to increase their employability.

PSO3. Develop critical thinking power and innovative ideas of translational importance.

PSO4. To build-up confidence in venturing in to basic and advance research leading to academic achievements at national as well as international levels.

PSO5. To make the students competent enough to teach and train others later in their academic lives.

PSO6. To inculcate ethics and professionalism in the students to perform and extend services to the peoples and communities for their betterment.

Course Outcomes (COs) I-M.Sc. Programmes

1st NS-101-108

CO1. To develop advance knowledge on cellular and molecular organization of living cells.

CO2. To understand the fundamental principles of Genetics and the pattern of inheritance of genetic traits

CO3. To understand the anatomical structure of brain and various types of brain cells and their functions

CO4. To obtain practical training in cell biology, cytogenetics, and molecular biology techniques

CO5. To learn working principles and applications of various tools and techniques applied in neuroscience research.

CO6. Trained to work independently on any experimental problem relevant to the subject.

2nd NS-201-208

CO1. To understand the molecular properties of biomolecules, their synthesis and cellular functions

CO2. To learn the properties and functions of various biomolecules, including neurotransmitters, receptor proteins, etc., involved in the neurochemical regulation of brain function.

CO2. To understand the evolution and development of brain (neurogenesis) in various animal systems, including human, the molecular mechanisms involved in the process of neurogenesis during embryonic and adults stages and related pathologies.

CO3. To understand the mechanism of nerve conduction, including electrical properties of excitable membranes or neurons, neural circuitry, synaptic transmission, etc.

CO4. To train experimentally on various aspects of biochemistry, molecular biology, neural development and its regulation, neurophysiology, etc.

CO5. Trained to work independently on any experimental problem relevant to the subject.

3rd NS-301-308

CO1. To learn the detailed organization, properties and functions of human immune system in health and diseases

CO2. To understand the neurobiology of sensation with special reference to organization, properties and functions of various basic senses, including somatic sensation, olfaction, vision, audition, etc. Basic overview on both sensory and motor systems will be obtained.

CO3. To learn about central regulation of major systems and autonomic functions, including central control of breathing, cardiovascular activities, circadian timings, sleep, psychosexual developments, etc.

CO4. To get the basic understanding of evolution of human brain and behaviour, cellular and genetic aspects of behaviour, cognitive development, neural control of attention, language acquisition and language processing, learning and memory, etc.

CO5. To provide theoretical and practical exposure to various methods involved in studying neuropathology and behaviour and brain functions.

CO6. Trained to work independently on any experimental problem relevant to the subject.

4th NS-401-405

CO1. To understand the neurochemical bases of brain disorders and principles and applications of important diagnostic tools

CO2. To learn the neurogenetic base of various neural disorders, including HD, Alzheimer's, Parkinson's, Schizophrenia, etc..

CO3. To provide professional hands-on research experience of 4-5 months, as a small research dissertation work.

CO4. Trained to work independently on any experimental problem relevant to the subject.