School of Studies in Biochemistry
Jiwaji University, Gwalior

School of Studies in Biochemistry came into existence in 1986 with the aim to impart quality education and to prepare the human resource for advance research, teaching, industrial sector as well as proper training for entrepreneurship development. The school is one of the few ones in the campus that produces students of high academic distinctions every year. The postgraduate curriculum is updated almost every alternate year to infuse the latest developments into the curricula. The School attracts students from all over the country and the admission to PG course of the School is on the basis of merit in the National Level Entrance Test. The teaching program of the school has been on the sound footing since the time of its inception because of sincere and dedicated faculty of the School. The School has developed MOU with various national laboratories for training to the students of the school. The School envisioned developing into a nucleus of advanced research in the years to come and all efforts are set in motion in that direction. The School is recognized by Department of Science and Technology, Ministry of Science and Technology for financial support under FIST Program. The alumni of the School are working at various prestigious research institutions, Central and State universities, colleges, IITs, IISERs, AIIMS, and in Private Sectors Companies like various Pharma companies, Food and Dairy industries, at National and international level. The school runs following course:

1. M.Sc.
2. Ph.D.

Program Specific Outcomes [PSOs]

The course curriculum of Master's Degree in Biochemistry has been designed to prepare the students to attend the following program specific outcomes:

PSO1: Developing the ability to understand and interpret the various biochemical phenomena related to fundamental principles of life, get a balance understanding of the physical, chemical and biological properties of biomolecules, their reactivity and pathways in which they operate, get exposed to the themes related to their metabolism, evolution, dynamics, regulation and the biochemical relationship between the structure and function.

PSO2: To develop critical thinking power and skills to translate the innovative ideas into products/procedures beneficial for the mankind.

PSO3: To develop the skills of delivering their ideas in public and to participate in fruitful discussion with the aim to develop the teaching skills and improve the oration capabilities.

PSO4: To build-up confidence in venturing into basic and advance researches leading to academic achievements, creation of knowledge and know how at national and global levels.

PSO5: To train them in specific fields to inculcate the spirit of developing into successful entrepreneurs in due course of time.

PSO6: To inculcate the ethics and values, awareness towards the surroundings, professionalism and concern about the people and communities who need their services. To develop the feelings of responsibility and concern towards the problems of national importance and the alacrity to positively contribute to the get the solutions.

Course Outcomes [COs]

M.Sc. I Semester

CO BCH-101: Developing concepts of cell biology and knowledge of structure, functions and composition of microbial, plant and animal cells and the subcellular organelles therein.

CO BCH-102: The knowledge of the structure of biomolecules, gives an understanding of their physical and chemical properties and the basis of their functions in living organisms. It prepares a student for more advanced studies in Biochemistry.

CO BCH-103: Learning basics of microbiology and the biochemical processes occurring in microbes, pathogenicity and diseases, prevention and cure.

CO BCH-104: The prime objective of the course is to develop trained manpower that would take up the challenges of research in Life Sciences in general and Biochemistry in particular. The students will be aware of the principle and applications of common instruments as well as specific, sophisticated instruments commonly used in Life Science research.

CO BCH-105: Gaining the experience of the practical in hand training of execution and analysis of experiments related to theory papers BCH-102 and BCH-102.

CO BCH-106: Gaining the experience of the practical in hand training of execution and analysis of experiments related to theory papers BCH-103 and BCH-104.

CO BCH -107: Developing skills of retrieving the literature, preparation of presentation and delivering effective presentation, art of answering the question raised by the audience, non-verbal communication and understanding the importance of body language. The course will also help in developing power of effecting listening, non verbal communications and interaction with the speaker and the whole group of audience.

CO BCH-108: Developing the skills of literature search relevant to the topic, and scientific writing and editing.

CO BCH-109: Training the students for facing the interview and the answering the question in a comprehensive manner.

M.Sc. II Semester

CO BCH -201: To understand the basic principles of life at the molecular level and enhancement of analytical and research problem solving skills.

CO BCH-202: Understanding the basic concept of immunology, the defense system of the body and diseases associated with immune system and strategies to combat any infection.

CO BCH-203: The study of Bioenergetics and metabolism defines the pathways for the biosynthesis (anabolism) and breakdown (catabolism) of biomolecules and how they are interrelated. It also explains the mechanism, and the importance of the regulation of metabolic pathways which when disturbed may lead to diseased states.

CO BCH-204: Understanding the basic concepts of enzymes, their purification, characterization, kinetics and their applications in research, medicine, industry, agriculture

CO BCH-205: Gaining the experience of the practical in hand training of execution and analysis of experiments related to theory papers BCH-102 and BCH-102.

CO BCH-106: Gaining the experience of the practical in hand training of execution and analysis of experiments related to theory papers BCH-103 and BCH-104.

CO BCH-207:
CO BCH-208:
CO BCH-209:

Same as BCH-107, BCH-108 and BCH-109

M.Sc. III Semester

CO BCH-301: To **develop u**nderstanding the basic principles of recombinant DNA technology, methods for protein production and their application in industrial production systems

CO BCH-302A: To give new knowledge and widening of the knowledge acquired in other *course* by handling of classical and modern plant biochemistry processes, including breeding of healthy plants, plant tissue culture, plants with improved characteristics and plants for biomolecule production. The course will also consider the chemical constituents of plants, their synthesis, their contribution to key metabolic processes and the regulation of their biosynthesis.

CO BCH-302B:

CO BCH-303A: The most job oriented course which will give the students, the exposure of clinical tests and other tests used for diagnosis and confirmation of diseases. At the end of the course, students will be able to discuss the fundamental biochemistry related to health, and under the conditions of disease, clinical significance of the pathological/biochemical tests and their diagnostic importance, and the effectiveness of the therapeutic practices. The course will create awareness of different lifestyle diseases increasingly found in present day.

CO BCH-303B: Understanding the horizons of genomics and proteomics, Insight into the methods to study protein interactions and their applications in research and industry.

CO BCH-304: To develop basic understanding of the hormones and their action as well as related disorder. The course will also enable the students to understand the basic physiological processes, their mechanism and the disorders related to physiological abnormalities.

CO BCH-305: The course will develop the skill of planning and executing the basic exercises of genetic engineering and plant biochemistry.

CO BCH-306: Gaining the experience of the practical in hand training of execution and analysis of experiments related to theory papers BCH-303 and BCH-304.

CO BCH-307:
CO BCH-308:
CO BCH-309:

Same as BCH-107, BCH-108 and BCH-109

M.Sc. IV Semester

CO BCH-401A: The course will impart basic knowledge of important cellular processes, understanding cell biology mechanisms playing important roles in cellular signaling pathways, mechanism of signal transduction and cell death

CO BCH-401B: To gain insight into the latest developments taking place in field of Biochemistry and life sciences. The elementary biostatistics will be helpful in designing the experiments and monitoring the significance of the outcomes.

CO BCH-402: Gaining the experience of the practical in hand training of execution and analysis of experiments related to theory papers BCH-401.

CO BCH-403:
CO BCH-404:
CO BCH-406:

Same as BCH-107, BCH-108 and BCH-109

CO-BCH-405: By undertaking dissertation work, the students will develop knowledge and understanding in a specialized area within the broad field of Life Sciences in general and Biochemistry in particular. The course will enable them to identify a research question, search related literature, identify methods to solve the problem, critically analyze and evaluate the research outcome and integrate theory and practical, communicate in written form by integrating, analyzing and applying the key texts and practices and demonstrate advanced critical research skills in relation to career development in this area or work-related learning studies.