

**DIGAMBARRAO BINDU ARTS, COMMERCE AND SCIENCE COLLEGE BHOKAR, DIST. NANDED**

**DEPARTMENT OF BIOPHYSICS**

**Programme Outcome**

- ❖ Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
- ❖ Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments The skills of observations and drawing logical inferences from the scientific experiments.
- ❖ Analyzed the given scientific data critically and systematically and the ability to draw the objective conclusions.
- ❖ Realized how developments in any science subject helps in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments.
- ❖ To develop scientific outlook not only with respect to science subjects but also in all aspects related to life.
- ❖ Realized that knowledge of subjects in other faculties such as humanities, performing arts, social sciences etc. can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.
- ❖ Imbined ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.
- ❖ Developed various communication skills such as reading, listening, speaking, etc., which we will help in expressing ideas and views clearly and effectively. Realized that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.

### **PSO: Programme Specific Outcome in Biophysics**

The interdisciplinary biophysics program explores the complexity of living systems with a quantitative physical approach

After the successful completion of the Biophysics program, majors should be able to:

- Demonstrate a thorough comprehension of the core concepts of classical and modern Biophysics.
- Biophysicists apply the understanding, methods and quantitative skills gained in physics to a vast array of biological systems to gain new insights into gene therapy, cancer, muscle function, cell motility, neuroscience, biomedical engineering, and biomaterials technology.
- Assess the validity of Biophysical theories through the design and execution of an experiment, for development of lab skills.
- Solve Biological problems using the appropriate methods in mathematical, theoretical and computational physics (“problem solving”).
- Apply their experience and knowledge to analyze new Biophysical situations (“applications”).

### Course outcome in Biophysics

**Outcomes:** After completion of syllabus students will be able to understand following outcomes.

| Class                             | Course Name and No                        | Outcomes:  |
|-----------------------------------|---|--|
| <b>B. Sc. First Year (Sem- I)</b> | <b>Molecular Biophysics-I</b>             | <ul style="list-style-type: none"> <li>❖ To impart basic knowledge of biochemistry.</li> <li>❖ To make familiar with physico-chemical foundation of biophysics.</li> <li>❖ To know the structure and properties of macromolecules that interacts to maintain and perpetuate the living systems.</li> <li>❖ To interpret the biochemistry fundamentals and mechanisms in terms of building blocks of life.</li> </ul> |
|                                   | II: Biostatistics & Computer Fundamentals | <ul style="list-style-type: none"> <li>❖ To fulfill the data manipulation practices.</li> <li>❖ To learn, use and interpret results of descriptive statistical methods effectively.</li> <li>❖ To apply statistical approaches in solving biological data processing</li> <li>❖ To make appropriate use of statistical software and computer</li> </ul>  |
| <b>B. Sc. First Year (Sem-II)</b> | III: Cellular Biophysics                  | <ul style="list-style-type: none"> <li>❖ To gain knowledge in Cellular Biophysics as an important prerequisite in understanding the various branches and emerging areas of Life Sciences</li> <li>❖ To identify cellular structures and function</li> <li>❖ To distinguish different cells in terms of structure-function relationship.</li> </ul>   |
|                                   | IV: Basic Biophysical Techniques          | <ul style="list-style-type: none"> <li>❖ learn the underlying principles of isolation, purification, quantification and characterization of biomolecules.</li> <li>❖ understand the outcome of results from techniques.</li> <li>❖ Identify, diagnose faults and repair the instruments.</li> </ul>  |
|                                   | VI: Membrane Biophysics                   | <p>At the end of the course students should</p> <ul style="list-style-type: none"> <li>❖ Student able to understand functional and structural aspects of Membrane.</li> </ul>  |

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| <b>B. Sc. Second Year (Sem-III)</b> |                                       | <ul style="list-style-type: none"> <li>❖ Membrane transport understanding with dynamics and signal transduction.</li> <li>❖ Able to underlie Physical Properties of membrane.</li> </ul>  |
|                                     | <b>CCBP-VII: Molecular</b>            | <p>At the end of the course students should</p> <ul style="list-style-type: none"> <li>❖ They will gain an understanding of chemical and molecular processes that occur in and between cells.</li> <li>❖ They will gain insight into the most significant molecular and cell-based methods used today to expand our understanding of biology</li> </ul>   |
| <b>B. Sc. Second Year (Sem-IV)</b>  | <b>VIII: Physiological Biophysics</b> | <p>At the end of the course students should:</p> <ul style="list-style-type: none"> <li>❖ Have an enhanced knowledge and appreciation of Human physiology</li> <li>❖ understand the functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems</li> <li>❖ Understand how these separate systems interact to yield integrated physiological responses to Different Physiological Condition.</li> </ul> |
|                                     | <b>CCBP-IX: Molecular Enzymology</b>  | <p>At the end of the course students should:</p> <ul style="list-style-type: none"> <li>❖ Be able to describe the basic properties of enzymes.</li> <li>❖ Be able to describe the basic properties of enzymes.</li> <li>❖ Understand and be able to discuss the metabolic pathway for the catabolism of glucose.</li> </ul>   |

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| <b>B. Sc. Third<br/>Second Year<br/>(Sem- V)</b> | <b>XII:<br/>Immunology</b>                                       | <ul style="list-style-type: none"> <li>❖ Able to provide students with knowledge on how the immune system works building on their previous knowledge from biochemistry, genetics, cell biology and microbiology;</li> <li>❖ Be able to clearly state the role of the immune system</li> <li>❖ Be able to compare and contrast the innate versus adaptive immune systems.</li> <li>❖ Be able to articulate the roles of innate recognition receptors (i.e. Toll-Like Receptors) in immune responses;</li> <li>❖ be able to distinguish various cell types involved in immune responses and associated functions;</li> </ul> |
|  | <b>XIII:<br/>Bioinformatics<br/>&amp; Structural<br/>Biology</b> | <p>After completing this course, you should be able to: ▲</p> <ul style="list-style-type: none"> <li>❖ implement solutions to basic bioinformatics problems ▲</li> <li>❖ discuss the use of bioinformatics in addressing a range of biological questions ▲</li> <li>❖ describe how bioinformatics methods can be used to relate sequence, structure and function ▲</li> <li>❖ discuss the technologies for modern high-throughput DNA sequencing and their applications ▲</li> <li>❖ use and describe some central bioinformatics data and information</li> </ul>  |

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|                                   |                                       | resources   |
| <b>B. Sc. Third Year (Sem-VI)</b> | <b>XIV: Radiation Biophysics</b>      | <p>After completing this course, you should be able to Students will be able to handle with radioactive markers and radioactive sources with the required precaution. Considering radiotoxicity, they will know how to identify and classify several most dangerous and most often used radionuclides in medical diagnostics and therapy, and will understand and estimate radiation risk for patients and personnel.</p> <ul style="list-style-type: none"> <li>❖ Students will be able to bearing in mind the repairing mechanisms of radiation damage, they will be able to justify the type of the appropriate radiation and its exposure time, and estimate the probability of cell survival and repair for a delivered dose.</li> </ul> |
|                                   | <b><u>-XV: Medical Biophysics</u></b> | <ul style="list-style-type: none"> <li>❖ Students will function successfully in the laboratory and use safe laboratory practices.</li> <li>❖ list and describe physical principles of selected physiological processes including the main concepts of the biophysics of sensory organs</li> <li>❖ -list and describe the principles of devices used in medicine and to apply this knowledge in recognizing possible risks connected with the use of medical devices and in accepting the rules of safe use of these devices.</li> </ul>   |