CENTRE FOR BIOINFORMATICS
MAHARSHI DAYANAND UNIVERSITY, ROHTAK

Name of the Program	Multi Disciplinary	Program Code	
Name of the Course	Computers in Biology	Course Code	23BINX01MD01
Hours/Week	3	Credits	3
Max. Marks.	75	Time	3 Hours

Note: The examiner has to set a total of nine questions - two from each unit and one compulsory question consisting of short answer from all units. The candidate has to attempt one question each from each unit along the compulsory question and 5 in total ($5 \times 15 = 75$ marks)

Course Objectives:

This course aims to introduce

1. Basic concept of Biology and it's problems
2. The computer architecture
3. Computer forms and information technology
4. Computational Biology
5. Solving biological problems using computers

Course Outcomes:

Students completing this course will be able to

1. Identify and define the biological problems
2. Describe the organization of a computer
3. Different advancements of computers and information technology
4. Describe how computers can be used for solving biological problems
5. Explain the control points of gene expression at transcriptional and translational level

Unit - I

Introduction to Biological problems
Concept of biological diversity and Five Kingdom, Issues and problems of biological systems, Commercial explorations of biological entities for welfare of society, Technological advancements in biological research and applications

Unit - II

An Overview of the Computer System
The Parts of a Computer System; Looking inside the Machine; Software, Bringing the Machine to Life, The Shapes of Computers Today: Supercomputers; Mainframe Computers; Minicomputers; Workstations; Microcomputers or Personal Computers. Concept of Information technology

Unit - III

The world of Internet and Information Technology
Communication Process, Concepts related to inter-networking, Data Transmission speed, Communication Types (modes), Data Transmission Media, and Modem. Types of Networks, LAN Topologies, Computer Protocols

Unit - IV

Applying computers to solve biological problems
Bioinformatics: A new era of integrating computers and biology. Different dimensions of computational biology and its recent advancements

References:

1. Selzer, P. M., Marhöfer, R. J., & Rohwer, A. (2008) Applied bioinformatics An introduction- Springer, Verlag, Berlin, Heidelberg, Germany, 260
2. Rastogi S. C. (2014) Bioinformatics Methods and Applications - Genomics, Proteomics and Drug Discovery. PHI Learning
3. Jones, N. C., Pevzner, P. A., & Pevzner, P. (2004) An introduction to bioinformatics algorithms. MIT press
4. Miller, W. (2006) An Introduction to Bioinformatics Algorithms Biostatistics A foundation for analysis in the health sciences (2004) by Wayne W. Daniel (John Wiley).
5. Priti Sinha, Pradeep Sinha (2003) Computer Fundamentals (With CD) 6th Edition 6th Edition, BPB Publications