

## **Course contents for Bioinformatics**

**1. Faculty:** FLSB

**2. Course Code:**

**3. Course Title:** Bioinformatics

**4. Number of Credits:** Two

**5. Course objectives:**

This course is planned and structured keeping in mind that this might be the first exposure to computational biology for most of the students. Besides providing a basic understanding of the subject, various aspects of data analyses will be described. Classes will be conducted on network-enabled computers to acquaint students with the computational tools and applications utilized for analyzing biological systems. Practical sessions and extensive project work will be conducted to provide bioinformatics hands-on experience.

**6. Minimum prerequisites for taking this course, if any:**

Basic understanding of biomolecules, evolution and molecular biology will be assumed. Good computational skills are desired.

**7. Course structure with units, if applicable:**

- a. Sequence alignments and database searching
- b. Evolutionary relationships and phylogenetic analyses
- c. Predicting protein secondary and tertiary structures

**8. Reading suggestions:**

- a. Understanding Bioinformatics, Marketa Zvelebil and Jeremy O. Baum
- b. Blast, by Korf, Yandell and Bedell, O'Reilly Media
- c. Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids by Durbin, Eddy, Krogh, Mitchison, Cambridge University Press
- d. NCBI bookshelf, Sequence - Evolution – Function, Computational Approaches in Comparative Genomics, by Koonin and Y Galperin, <http://www.ncbi.nlm.nih.gov/books/NBK20260/>
- e. Bioinformatics, Paul H. Dear
- f. Biological Computation, Ehud Lamm and Ron Unger
- g. Bioinformatics Methods and Protocols, Stephen Misener and Stephen A. Krawetz
- h. Evolutionary Bioinformatics, Donald R. Forsdyke

**9. Evaluation:**

Mid-semester Written Examination	: 40% Marks
End-semester Written Examination	: 40% Marks
Quiz/Assignment/ Presentation (oral/poster)	: 20% Marks