

Systems Biology (SYB-331ME)

(Credits: 3 Theory + 1 Lab)

UNIT I

Biological Systems, Introduction to Mathematical Modelling, Static Network Models

UNIT II

Mathematical, Characterization of Network Capabilities, Biological Networks, Parameter Estimation

UNIT III

Gene Systems , Protein Systems, Population Systems, Methods for Protein-Protein Interaction Analysis, Metabolic Systems and Networks, Regulatory networks, Signalling Systems / Networks

UNIT IV

Integrative Analysis of genome, Protein and Metabolic Data, Physiological Modelling: The heart as an example

UNIT V

Systems Biology in Medicine and Drug Development, Design of Biological Systems

UNIT VI

Experimental Techniques for Systems Biology, Methods and Software platforms for System Biology, Emerging areas in Systems Biology.

Text/Reference Books:

1. A first Course in System Biology, *Eberhard Voit*, Mar 2012.
2. Introduction to System Biology, *Sangdun Choi (Ed)*, Jul 2007.
3. Systems Biology: A Text Book, *Edda Klipp et al.*, Aug 2009.
4. The Music of Life: Biology Beyond Genes, *Denis Noble*, Apr 2008.