



FORMAT FOR COURSE CURRICULUM

Course Title: Basics of Immunoinformatics

Course Code: BIOF712

Credit Units: 02

L	T	P/S	SW/F W	TOTAL CREDIT UNITS
2	0	0	0	02

Course Objectives:

Theory: This course will enable the students to acquire skill set for insilico immunological studies.

Pre-requisites: Basic knowledge about immunology & computers.

Student Learning Outcomes:

- The students will apply knowledge of immune responses to various pathogens by integrating genomics and proteomics with bioinformatics strategies.
- The student will analyze computer aided vaccine design.

Course Contents/Syllabus- Theory:

	Weightage (%)
Module I	35
Descriptors/Topics: Introduction to Immunoinformatics and Immunological Databases Introduction to immunology & Bioinformatics, immunoinformatics, the immune system, cellular immunity, antibody mediated immunity. Immunological databases-dbMHC-MHC database at NCBI, MHCBN-comprehensive database of MHC binding and non-binding peptides, T-cell epitope databases, B-cell epitope databases. SYFPEITHI MHC-presented epitopes	
Module II	35
Descriptors/Topics: Immunological Tools Experimental and theoretical description of peptide-MHC binding, selection of epitopes using bioinformatics, prediction of proteasome processing, and TAP binding, Predictions of Class I and Class II MHC Epitopes, IEDB analysis	

Resource, CTLPred, Population Coverage analysis, Epitope conservancy analysis.	
Module III	30
Descriptors/Topics: Computational Vaccinology Introduction to vaccines, Different generations of Vaccines, Concepts of reverse vaccinology, case study of Reverse Vaccinology with Meningococcus B, Comparison of Traditional Vaccinology and Reverse Vaccinology, Tools & servers for computational Vaccine design-from Genome to Vaccine.	

Pedagogy for Course Delivery:

The class will be taught using theory and practical based method. In addition to assigning the practical methods, the course instructor will spend considerable time in understanding the concept of innovation through the eyes of the consumer. The instructor will cover the ways to think innovatively liberally using thinking techniques.

Lectures: 27

Tutorial:

Presentation/ Seminar: 2

Class Test: 1

Total: 30

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total (%)
100	NA	100

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Class Test 1	Viva	Home Assignment	Attendance	
Weightage (%)	10	5	10	5	70

Text & References:

- Immunoinformatics: Bioinformatic Strategies for Better Understanding of Immune , (2008)Wiley Publications
- Predicting Immunogenicity In Silico Series(2013): Methods in Molecular Biology, Flower, Darren R.