

Open Elective *Syllabus*

(With effect from the year 2018-2019)



Department of Chemistry
Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya
(University established under sec 3 of UGC Act 1956)
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Semester	Part	Sub. Code	Title of the Paper	L	P	T	Credits
III		OE3BI	Basics of Bioinformatics	2	-	-	1

Aim: To gain introductory knowledge about bioinformatics.

Objectives:

- To know the fundamentals of biological databases.
- To know the different levels of protein structure

Outcome:

- To gain knowledge about the biological databases and structure of DNA and protein.

Unit-I: DNA and protein databases

Understanding DNA and protein sequences – DNA and protein databases – preliminary level analysis of DNA and protein sequences using bioinformatics tools. Examples of related tools (FASTA, BLAST), databases (GENBANK, PUBMED, PDB) and softwares(RASMOL,Ligand Explorer). Applications of Bioinformatics.

Unit-II: Protein structural databases

Biological Database and its Types Introduction to data types and Source. General Introduction of Biological Databases; Nucleic acid databases (NCBI, DDBJ, and EMBL). Protein databases (Primary, Composite, and Secondary). Specialized Genome databases: (SGD, TIGR, and ACeDB). Structure databases (CATH, SCOP, and PDBsum)

Unit-III : Protein structure

Protein Structure: Primary, Secondary, Tertiary, Quaternary, Ramachandran plot.

Text Books:

1. Introduction to Bioinformatics, Attwood, P.Smith, Benjamin Cummings, 2001.
2. Introduction to Bioinformatics, Arthur M. Lesk, OUP Oxford, 2013

Reference Books:

1. Bioinformatics - A Beginners Guide. Jean-Michel Claverie, Cedric Notredame, WILEY. 2003.
2. Essential Bioinformatics, Jin Xiong, Cambridge University Press, 2006.

Semester	Part	Sub. Code	Title of the Paper	L	P	T	Credits
III		OE3CI	Chemistry in crime investigation	2	-	-	1

Aim: Understanding the basics of forensic science and analytical methods employed in it.

Objectives:

- To introduce the time-line and basics of forensic science.
- To understand the basics of physical and trace evidence processing.

Outcome:

- Realization of the importance of forensics in scientific way of solving a crime.

Unit-I Basics of forensic science

Introduction to forensic science – time line of forensics – divisions of forensics – latest techniques used.

CSI – crime scene – Locard’s principle – limitations – preservation of crime scene – recording the scene – forensic photography - search patterns – value of trace evidences – list of possible trace evidences.

Unit-II Physical & trace evidences

Finger prints –individuality –pattern classification – latent prints – developing the latent prints – chemical and physical methods – foot prints – location and preservation- collection of foot prints – Gait pattern – deductions from walking pattern.

Trace evidences – hairs – fibers – blood – semen – soil – dirt – tyre marks- skid marks- glass – paints.

Unit-III Forensic toxicology and document study

Forged documents – types of forgery - detection - counterfeit currencies – hand writing analysis – factors affecting hand writing – erasures- alterations – additions – obliterations – order of writing – age of writing. Forensic toxicology – alcohol – blood alcohol level- drugs – narcotics – poisons – toxins – methods of identifications. Arson cases- detection of residual fuel – firing pattern analysis.

Text Books:

1. Forensic Science in Crime Investigation – B.S. Nabar – 3rd edition -Asia Law House Hyderabad, 2010.
2. Forensic science – an introduction to Scientific crime investigation – H.J.Walls – 2nd edition- Universal Law publishing Co. Delhi, 2006.
3. Dhruva Charan Dash, Analytical Chemistry, PHI Learning Private Ltd., 2011.