5.	Benjamin Lewin	Genes VIII	Penguin books ltd	2004

WEB SOURCES:

- https://wikispaces.psu.edu/ChromosomebehaviorandGeneLinkage
- https://en.wikipedia.org/wiki/Geneticcounseling

SYLLABUS DESIGNER:

- Dr.V. Prabha,Head& Assistant Professor of Bio-Chemistry
- Ms.T. Nalini, Assistant Professor of Bio-Chemistry

BIOTECHNOLOGY AND BIOINFORMATICS

Sem	Subject Code	Category	Lecture		Theory		Practical		Credit
			Perweek	Per sem.	Per week	Per sem.	Per week	Per sem.	
IV	21CPBC4B	Core	3	45	3	45	-	-	3

COURSE OBJECTIVE:

To provide a holistic view of biotechnology from basics to advanced applications, also make them aware the application of various computational tools in Bioinformatics and related subjects.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level ($K_1 – K_4$)
CO1	Understood the relationship between genetic engineering.	**K1**
CO2	Students will acquire knowledge on the animal and plant biotechnology	**K2**
CO3	To understand about the fundamentals of bioinformatics	**K2**
CO4	Learnt the concepts of similarity search and sequence alignment and its software tools.	**K3**

CO5	Students will knowledge about the classification and conformation of proteins	**K4**

(*CO – course Outcomes Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

MAPPING WITH PROGRAMME OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M	S	M	M	M
CO2	S	S	S	S	M	M
CO3	M	M	M	M	M	S
CO4	M	M	S	S	S	M
CO5	S	S	M	M	S	M

(S- Strong; M-Medium; L-Low)

Total Hours: 45

UNIT-I:

Genetic Engineering and Recombinant DNA Technology **8 Hours**

Introduction to Genetic Engineering, Basic techniques in genetic engineering, polymerase chain reaction, gene libraries, Site – directed Mutagenesis and protein Engineering, Manipulation of gene expression in host cells, human genome project.

UNIT-II:

Animal and Plant Biotechnology **15 Hours**

Animal cell culture – Fundamentals and its application, Culture media for animal cells, Cultured cells – biology and characterization, primary Culture and cell lines, transgenic Animals, Plant tissue culture, media, protoplast culture and somatic hybridization, Production of haploid plants, somaclonal variations, Germplasm conservation and cryopreservation, Genetic Engineering of plants – Methodology, application of plant transformation and transgenic plants, transgenic plants as bioreactors, growth promoting bacteria in plants, molecular marker aided plant breeding.

UNIT III

Introduction Bioinformatics and Biological Databases **7 Hours**

Bioinformatics: Introduction, definition, objectives and scope. Application of Bioinformatics.General Introduction of Biological Databases; Nucleic acid databases (NCBI, DDBJ, and EMBL), Protein databases.

UNIT IV

Sequence Analysis **7 Hours**

Introduction to Sequences, alignments and Dynamic Programming; Pair wise alignment (BLAST and FASTA Algorithm) and multiple sequence alignment (Clustal W algorithm) software tools for sequence analysis.

UNIT V

Protein Classification and Structure Visualisation **8 Hours**

Overview of the Protein Structure, Protein Structure Visualization and prediction: Pymol, Rasmol, and Structure - based Protein Classification, Protein Structure databases, Protein Structure Visualization Databases and tools, online tools for protein structure analysis.

DISTRIBUTION OF MARKS: Theory - 100% and Problems – Nil

TEACHING METHODOLOGY:

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

TEXT BOOKS:

S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	M.M Ranga	Animal Biotechnology	Agro Bios	2007

2	Rajagopal, K.,Kathiravan, G. and Karthikeyan; S.	Introduction to Plant Biotechnology	DGI, publishers	2014
3	U.Satyanarayana	Biotechnology	Uppala author Publisher interlinks	2009
4	D.W. Mount	Bioinformatics	Cold spring Press	2001
5	Westhead D.R, Parish J.H and Twyman R.M.	Instant notes in Bioinformatics	Cambridge University press	2003
6	Attwood.T.K. Parry D.J. and Smith	Introduction to Bioinformatics	Oxford University Press	2001

REFERENCE BOOKS:

S. NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Ashish S Verma	Animal biotechnology	Academic Press	2014
2	Ravi Pathak	Introduction to Animal Biotechnology	Atlantic publishers and distributors	2007
3	Veerabalarastogi	Biotechnology	Ane books india	2008
4	Dr.K.ManiN.Vijayaraj	Bioinformatics	Kalaikathirachchagam	2002
5	Rastogi.S.C, Namita	Bioinformatics	Ane books india	2008
6.	Lesk, A. K	Introduction to Bioinformatics, 4th Edition	Oxford University Press	2013

WEB SOURCES

- https://gs.ucdenver.edu/ministem/pdf/2014_miniStem_Bennett.pdf
- www.slideshare.net/italianoascuola/master-in-plant-and-animal-biotechnology
- www.slideshare.net/Pure-man/introduction-to-animal-biotechnology

- www.slideshare.net/biinoida/bioinformatics
- www.slideshare.net/PrashantTripathi59/sequence-analysis-71940516
- www.creative-proteomics.com/services/protein-structure-analysis-service.htm

SYLLABUS DESIGNER:

- Dr. K. Shoba, Assistant Professor of Bio-Chemistry
- Dr.S. Asha, Assistant Professor of Bio-Chemistry

CORE PRACTICAL IV

BIOCHEMICAL ANALYSIS OF BLOOD, IMMUNOLOGICAL & MOLECULAR METHODS

Sem	Sub. Code	Category	Lecture		Theory		Practical		Credit
			Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	
IV	21CPBC41	Core Practical	-	-	-	-	5	75	5

I. BIOCHEMICAL ANALYSIS OF BLOOD

1. Estimation of A/G ratio by Reinhold method .
2. Estimation of Urea by Diacetylmonoxime method.
3. Determination of Protein by Lowry's method.
4. Determination of LDH activity in serum.
5. Estimation of Uric acid by Caraway's method.
6. Estimation of Creatinine in serum by Jaffe's method.