Unit 5	**Pharmacogenomics and Personalized Medicine:** Single nucleotide polymorphism; Principle of pharmacogenomics; Case studies for personalized medicine	**9**
Total		**45**

Books: -

S.No.	**Name of Books/ Author/Publisher**
1.	Principles of Gene Manipulation and Genomics by SB Primrose. Publisher: John Wiley
2.	Proteomics Methods and Protocols by J Reinders, A Sickmann. Publishers: Humana Totowa, NJ
3.	Discovering Genomics, Proteomics and Bioinformatics by AM Campbell, LJ Heyer. Publisher: CSHL Press
4.	Functional Genomics: A Practical Approach by SP Hunt, R Livesey. Publisher: OUP
5.	Introduction to Proteomics: Tools for the New Biology by DC Liebler. Publisher: Humana Totowa, NJ
6.	Principles of Proteomics by R Twyman. Publisher: Garland Science
7.	Proteomics: From Protein Sequence to Function by S Pennington, MJ Dunn. Publisher: BIOS Scientific
8.	A Practical Approach to Microarray Data Analysis by DP Berrar, W Dubitzky, M Granzow. Publisher: Springer
9.	Introducing Proteomics: From Concepts to Sample Separation, Mass Spectroscopy and Data Analysis by J Lovric. Publisher: Willey-VCH
10.	Functional Genomics: Methods and Protocols edited by M Kaufmann, C Klinger, A Ssvelsbergh. Publisher: Humana New York, NY
11.	Genomics and Proteomics: Principles, Technologies, and Applications by D Thangadurai, J Sangeetha. Publisher: Apple Academic

STRUCTURAL BIOLOGY

Details of course: -

Course Title	**Course Structure**			**Pre-requisite**
	L	**T**	**P**	
Structural Biology (BT405)	3	1	0	Nil

Course Objective: To understand the structures of proteins and DNA and their interactions with other molecules

Course Outcomes (CO):

6. To understand the native functional structure of proteins 7. To explain the underlying mechanisms of interactions of proteins with other molecules 8. To comprehend the structure of DNA 9. To understand properties of DNA with respect to temperature and covalent modification 10. To be able to explain and design proteins with desirable properties

S. No.	Content	Contact Hours
Unit 1	**Protein Architecture:** Amino acids: Structure and function; Primary, Secondary, Tertiary and Quaternary structures of proteins; Structure of antibody and hemoglobin; Unstructured proteins	**9**
Unit 2	**Protein-ligand Interactions:** Enzyme-substrate interactions: Lock and key versus handshake mechanism; Receptor-signal interactions: Activation of cell surface receptors; Protein-protein interaction motifs	**8**
Unit 3	**DNA Structure:** Covalent structure of DNA; Watson Crick model; Unusual structures of DNA; Variants of B-DNA	**9**
Unit 4	**DNA Properties and Interactions:** DNA melting and annealing, DNA methylation; DNA binding motifs	**8**
Unit 5	**Protein Engineering:** Methods to design of new proteins; Protein stability	**8**
	Total	**42**

Books:

S. No.	Name of Authors / Books / Publishers	Year of Publication / Reprint
1.	Essentials of Molecular Biology by Malacinski. Publisher: Jones and Bartlett Publications	2003
2.	Biochemistry by Voet and Voet. Publisher: Wiley	2010
3.	Biochemistry: The Chemical Reactions of Living Cells by Metzler. Publisher: Elsevier	2001
4.	Lewin's Gene XII by Kreb's et al. Publisher: Jones & Bartlett Learning	2017
5.	Introduction to Protein Architecture: The Structural Biology of Proteins by Lesk. Publisher: Oxford University Press	2001
7.	Molecular Biology of the Gene by Watson et al. Publisher: Pearson	2014