

Programme	BS Zoology	Course Code	ZOOL-213	Credit Hours	2
Course Title	Biochemistry-I				
Course Introduction					
<ul style="list-style-type: none"> To provide knowledge about macro molecules of eukaryotic cells and organelles, including membrane structure and dynamics; To provide in-depth knowledge about the polymerized organic compounds of life. To provide knowledge of the principles of bioenergetics and enzyme catalysis To provide knowledge of the chemical nature of biological macromolecules, their three-dimensional structure, and the principles of molecular recognition 					
Learning Outcomes					
By the end of the course, students should be able to: <ol style="list-style-type: none"> Demonstrate knowledge and understanding of the molecules of living cells; Demonstrate knowledge and understanding of the principles that govern the structures of macromolecules and their participation in molecular recognition; Analyse, interpret, and participate in reporting to their peers on the results of their laboratory experiments; Participate in and report orally on team work investigations of problem- based assignments; 					
Course Content					Lecture/Reading
Week 1	Introduction to Macromolecules				Lecture/Reading
	<ul style="list-style-type: none"> Structure, types and role of various building blocks their respective macromolecules. Carbohydrates: Introduction; Classification Stereoisomerism 				Lecture/Reading
Week 2	<ul style="list-style-type: none"> Structure, types and role of monosaccharides, oligosaccharides and 				Lecture/Reading
	<ul style="list-style-type: none"> Polysaccharides 				Lecture/Reading
Week 3	<ul style="list-style-type: none"> Glycosaminoglycans and glycoconjugates; 				Lecture/Reading
	<ul style="list-style-type: none"> Carbohydrates as an information carrier molecule. 				Lecture/Reading
Week 4	Amino acids, peptides & proteins:				Lecture/Reading
	<ul style="list-style-type: none"> Types of amino acids & their classification; Uncommon amino acids; Acid/base behavior of amino acids. 				Lecture/Reading
Week 5	<ul style="list-style-type: none"> Titration curves in amino acids and their importance: 				Lecture/Reading
	<ul style="list-style-type: none"> Peptides & proteins; Biologically active peptides & polypeptides; 				Lecture/Reading
	<ul style="list-style-type: none"> Amino acid sequence in proteins & their importance; Conjugated proteins; 				Lecture/Reading
Week 6	Purification Techniques for Proteins				Lecture/Reading
	<ul style="list-style-type: none"> An outline of purification techniques for proteins 				Lecture/Reading
Week 7	<ul style="list-style-type: none"> Column chromatography, gel electrophoresis 				Lecture/Reading
	<ul style="list-style-type: none"> Isoelectric focusing 				Lecture/Reading
Week 8	Organization of proteins				Lecture/Reading
	<ul style="list-style-type: none"> Structural levels of proteins Hemoglobin, Cytochrome-c Chymotrypsin, alpha Keratin and Collagen 				Lecture/Reading
Week 9	<ul style="list-style-type: none"> Proteins, their examples and role 				Lecture/Reading
	Enzymes				Lecture/Reading
	Enzymes, their importance, classification				Lecture/Reading
	Nomenclature, Function & inhibition.				Lecture/Reading

Week 10	Lipids Introduction & classification of lipids;	Lecture/Reading
Week 11	Fatty acids, their types; Storage lipids	Lecture/Reading
	Classification and important characteristics Triacyclglycerols; waxes	Lecture/Reading
Week 12	Structural/membrane lipids	Lecture/Reading
	Glycerophospholipids	Lecture/Reading
Week 13	Ether and Ester linkages Galactolipids & Sulfolipids	Lecture/Reading
	Sphingolipids their types & importance: Sterols, their structure, types & functions	Lecture/Reading
Week 14	Examples of Functional diversity of Lipids as Signaling molecules	Lecture/Reading
	Cofactors, Electron carrier, antioxidants, pigments	Lecture/Reading
Week 15	Nucleic acids • Nucleic acids and their types; Structure and role of various Bases in nucleic acids	Lecture/Reading
	• Nucleoside & Nucleotides;	Lecture/Reading
Week 16	• Structure of DNA and RNA molecules;	Lecture/Reading
	• Organization and Chemistry of Double helical structure of DNA with their details.	Lecture/Reading
Textbooks and Reading Material		
<ol style="list-style-type: none"> 1. Lehninger principle of biochemistry by David L.Nelson and Michael M.Cox, 7th latest edition,ISBN-10:1-4641-2611-9,ISBN-13:978-14641-2611-6 2. Biochemistry by Jeremy M. Berg , John L. Tymoczko; Lubert Stryer ,ISBN- 10:1429229365,ISBN-13:97814229229364 3. Berg, J. M.,Tymoczko,J. L., Lubert Stryer. 2010. Biochemistry. 7th Ed. 4. Lodish, H., Berk, A., Zipursky, S. L., Paul. M., Baltimore D, Darnell, J. 2012. Molecular Cell Biology. 5. David L. Nelson, and Michael M. Cox, 2000. Lehninger Principles of Biochemistry, 3rd Ed., Macmillan Worth Publishers, New York. 6. Murray, R.K., Granner, D.K., Mayer, P.A. and Rodwells, V.W., 2000. Voet. D., Voet, J.G., and Pratt, C.W., 1999. Fundamentals of Biochemistry, John Wiley and Sons, Inc., New York. 7. Zubay, G., 1995. Biochemistry, 4th Ed., Wm. C. Brown Publishers, Inc., Oxford, England. 8. Stryer, L., 1995. Biochemistry, 6th Ed., W.H. Freeman and Company, New York. 		
Teaching Learning Strategies		
<ol style="list-style-type: none"> 1. Lectures 2. Readings 3. Prsentation 4. Home Assignment 5. Quiz 		
Assignments: Types and Number with Calendar		
<ol style="list-style-type: none"> 1st Assignment in Mid-term 2nd Assngment in Final-term 		