University of Management & Technology
School of Science
Department of Life Sciences

BC-211 Amino Acids, Proteins, and Nucleic Acids

Lecture Schedule	Monday and Wednesday	**Semester**	Spring 2019
Pre-requisite	F.Sc. /A-level Chemistry	**Credit Hours**	3+1
Instructor(s)	Miss Braira Wahid	**Contact Moodle link**	braira.wahid@umt.edu.pk
Office	2S-48	**Office Hours**	Displayed on Moodle

Objectives	• This course aims to provide students with fundamental knowledge of the proteins and nucleic acids, as well as their function in the context of a living cell. • To make students able to identify the structural elements of proteins and nucleic acids.
Expected Outcomes	This course will give a grounding in a subject • Of biochemistry that forms the basis of virtually all of the biological sciences. • Many exciting discoveries made in this area have contributed to our understanding of life, • This will also help in the solving of medical problems, and to the discovery and production of safe and effective drugs.
Course outlines	Amino Acids: Introduction, classification, properties of amino acids. Identification of amino acids by different methods. Biological role of amino acids. Proteins: Introduction to proteins and its types Acid- base properties of amino acids, pH dependent ionization of amino-acids, Identification of amino acids by different methods, Chemical and enzymatic reactions of amino acids, Structural organization of proteins, Protein denaturation and renaturation Nucleic acids: Brief introduction of nucleic acids, Composition and structure of DNA & RNA, Types of DNA and RNA, Function of the DNA & RNA, Compaction of DNA in nucleus, Extra nuclear DNA
Text book & Reference	1. D. Voet, J.G. Voet and C.W. Pratt 2002. Fundamentals of Biochemistry John Wiley and Sons. Inc., New York. 2. J.M. Berg, J.L. Tymoczko and L. Stryer 2002. Biochemistry. 5th Edition. W. H.

book(s)	Freeman and Company, New York. 3. T.M. Devlin (2002). Textbook of Biochemistry with clinical Correlations. 5th Edition. John Wiley and Sons. Inc., New York. 4. N.M. Berg, J.L. Tymoczko and L. Stryer 2006. Biochemistry. 6th Edition. W. H. Freeman & Co Ltd; 5. M. Cox and D.L. Nelson 2005. Lehninger Principles of Biochemistry. 4th Edition, Palgrave Macmillan.
Grading Policy	• Quizzes 10% • Assignments 10% • Midterm 25% • Final term 35% • Practical 20%

Course Schedule

Week	Lecture #	Topics
1	1 2	• Introduction to amino acids and their structure • Polypeptides; Isomerism, • Zwitterions
2	1 2	• Classification of amino acids; acid-base properties of amino acids Optical activity of amino acids;
3	1 2	• Isoelectric point (pI); separation and purification of amino acids; • Identification of amino acids by different methods; chemical and enzymatic reactions of amino acids
4	1 2	• Introduction to proteins, classification; Structure and function of proteins • Physical and chemical properties; Conjugated proteins
5	1 2	• Primary, secondary, tertiary and quaternary structure determination;
6	1 2	• Protein denaturation and folding; Interactions of proteins with other molecules
7	1 2	• Isolation, purification and characterization of proteins
8	1 2	• Advanced techniques for protein analysis • MIDTERMS
9	1 2	• Protein Function • Reversible binding of protein to a ligand
10	1 2	• Oxygen binding proteins
11	1 2	• Functioning of immunoglobulins, actin, myosin and molecular motors
12	1 2	• Basics of nucleotides and nucleic acids
13	1 2	• Nucleic acid structure
14	1 2	• Nucleic acid chemistry • Other functions of nucleotides
15	1 2	• NUMERICALS