



The Islamia University of Bahawalpur Pakistan

Department of Forestry, Range and Wildlife Management, UCA&ES

Instructors: Miss Ambar Iqbal

Semester: 1st MSc. (Hons.) Forestry

PURPOSE OF THE COURSE AND APPROACH TO THE SUBJECT:

Progress in various branches of life sciences, particularly in genetics, microbiology and biochemistry, has led to many fascinating discoveries made in the past few decades. Advances made in these fields have culminated into the development of several exciting new fields of knowledge like Molecular biology, recombinant DNA technology, Gene Cloning, Biotechnology, Bioinformatics etc.

The course being offered focuses on introducing the students to the basics of fascinating chemical constituents, their reactions and their role behind physiological activities of a living organism. Students will acquire knowledge of the main chemical and structural characteristics of biomolecules in relation to their role in cell metabolism; they will analyze the properties and functions of enzyme, vitamins and their regulation, bioenergetics and trans-membrane transport, the metabolic pathways and their regulation.

TEACHING METHODOLOGY

The class will be conducted in a lecture and discussion environment. The instructor will deliver the lecture and the students will be encouraged to critically evaluate the information and participate by asking questions.

GRADING AND EXAMS:

As per policy of the University.

COURSE CONTENTS

Week	Contents
1	Scope and importance of biochemistry in life sciences, Brief introduction of prokaryotic and eukaryotic cells. Transport mechanisms across bio membranes and osmosis.
2	Carbohydrates: Brief introduction, chemistry, classification and physiological role.
3	Glycolysis, Gluconeogenesis, Citric Acid cycle and its amphibolic role
4	Glycogen synthesis and breakdown, Bio-synthesis and degradation of sucrose and starch.
5	Lipids: Introduction, characteristics, classification and physiological role.
6	Fatty acids: Characteristics and Classification of Fatty acids and Triglycerides. Metabolism of fats: β -oxidation of fatty acids and its energy yield.
7	Assignments and Tutorials.
8	Mid Term

9	Amino acid: Introduction, chemistry, Types, classification and chemical characteristics.
10	Nitrogen excretion, urea cycle and its regulation.
11	Protein: Classification, Structure and Physiological role.
12	Protein sequencing, protein targeting, protein folding and unfolding, hydrolysis of proteins.
13	Nucleic acids: Bio synthesis and degradation of purines and pyrimidines. Central dogma of molecular biology, replication,
14	Transcription, translation, Introduction to genetic engineering.
15	Enzymes: Introduction, Nomenclature, Classification, properties, Factors affecting enzyme activity, Types of enzyme inhibition and Regulatory enzymes.
16	Vitamins: Introduction, definition, classification and their roles.
17	Assignments and Presentations
18	Final Term Exam

BOOKS RECOMMENDED:

1. Ahmad, M. 2006. Essential of Medical Biochemistry. Vol. I. Merit Publishers, Lahore.
2. Champe, P.C., R.A. Harvey and D.R. Ferrier. 2008. Biochemistry: Lippincott's Illustrated Reviews. 4th ed. Lippincott Williams and Wilkins. U.S.A.
3. Goodwin, T.W. and E.I. Mercer. 2003. Introduction to Plant Biochemistry, 2nd ed. CBS publishers and distributors. New Delhi.
4. Nelson, D.L and M.M. Cox. 2008. Lehninger Principles of Biochemistry. 5th ed. Worth Publishers, NY.
5. Rahman, K and M.A. Sheikh 2004. Basic concepts in Biochemistry. 2nd ed. Al Umer Publishers. Faisalabad.
6. Taiz, L. and E. Zeiger. 2006. Plant Physiology 4th ed. Sinauer Associates Inc., USA.
7. Voet, D.J.G Voet and C.W. Pratt. 2006 Fundamentals of Biochemistry. 2nd ed. John Wiley and Sons. Inc. NY.