

ADD ON COURSE ON

Biochemistry: The Chemistry of Life

ORGANISED BY

DEPARTMENT OF CHEMISTRY

IN ASSOCIATION WITH

IQAC, AGHOREKAMINI PRAKASHCHANDRA MAHAVIDYALAYA

Course Title: Biochemistry: The Chemistry of Life

Course Duration: 36 Hours (From 15.05.2023-25.06.2023)

Course Offered By: Department of Chemistry

Aghorekamini Prakashchandra Mahavidyalaya

Bengai, Hooghly, Pin-712611

Participating Teachers:

1. Dr. Ashoke Hazra (Assistant Professor)
2. Dr. Tarun Ghosh (Assistant Professor)
3. Prof, Asish Malik

Course Coordinators:

1. Dr. Ashoke Hazra and Dr. Tarun Ghosh

SYLLABUS

1. Carbohydrates: Photosynthesis and carbohydrate metabolism, Benedict's solution, Fehling's solution, Tollen's reagent, Medical and biological importance of carbohydrates, Glycolysis, TCA cycle.
2. Proteins: Classification and structure of proteins, Isolation and characterization of proteins, Denaturation of proteins.
3. Enzymes: Classification and nomenclature, Mechanism of enzyme action, Kinetics of enzyme action, Specificity of enzyme action, Enzyme inhibitors and the importance of inhibition of enzyme activity, Introduction to Biocatalysis: Importance in Green Chemistry and Chemical Industry.

4. Lipids: Classification, Importance of triglycerides, phosphoglycerides and cholesterol; Liposomes and their biological functions, Lipoproteins, Biochemical functions of peptide hormones.

5. Nucleic Acids: Nucleosides and nucleotides, Primary structure and secondary structure of DNA , Replication, Transcription, Genetic code and Translation, Introduction to Gene therapy.

6. Biochemistry of disease: A diagnostic approach

i. Blood: Composition and functions of human blood, Blood coagulation, Anticoagulants, Collection of blood and preservation, Anaemia, Estimation and interpretation of data for blood glucose, blood urea, creatinine, cholesterol and bilirubin.

ii. Urine: Collection and preservation of samples. Formation of urine. Composition of human urine, Urinalysis.

Reference Books:

1. Cooper, T.G., Tool of Biochemistry. Wiley-Blackwell (1977).

2. Devlin, T.M., Textbook of Biochemistry with Clinical Correlations, John Wiley & Sons, 2010.

3. Berg, J.M., Tymoczko, J.L. & Stryer, L., Biochemistry, W.H. Freeman, 2002.

4. Talwar, G.P. & Srivastava, M., Textbook of Biochemistry and Human Biology, 3rd Ed. PHI Learning.

5. Nelson, D.L. & Cox, M.M. Lehninger, Principles of Biochemistry, W.H. Freeman, 2013.

Course Schedule:

Serial no	Module no	Lectures required
1.	Module-1	08
2.	Module-2	05
3.	Module-3	07
4.	Module-4	05
5.	Module-5	05
6.	Module-6	06

[1 Lecture = 1 Hour]

After completion of this course the student will be able to

CO No	Course Outcomes	POs addressed	PSOs addressed	Cognitive Level
CO 1:	Understand carbohydrate metabolism, Glycolysis, TCA cycle	PO 1	PSO 1	U
CO 2:	Understand types of proteins, Isolation, characterization and denaturation of proteins	PO 1	PSO 1	U
CO 3:	Apply the mechanism of enzyme action to analyze kinetics of enzyme action	PO 3	PSO 3	Ap, C
CO 4:	Analyze the activity of different peptide hormones in biological systems	PO 2	PSO 2	An
CO 5:	Design Watson-Crick model of DNA and gene therapy	PO 3	PSO 3	Ap
CO 6:	Apply the knowledge for estimation and interpretation of data for blood and urine samples	PO 3	PSO 3	Ap, C

R= Remembering, U= Understanding, Ap= Applying, An= Analysing, E= Evaluating, C= Creating

Programme Outcomes (POs):

PO 1: Recognise the scientific temper and attitudes, which in turn can prove to be beneficial for the society since the scientific developments can make a nation or society to grow at a rapid pace.

PO 2: Understand scientific knowledge and exchange ideas with other stakeholders; make people aware about sustainable utilization of resources with ethical approach.

PO 3: Understand and apply the issues of environmental contexts and sustainable development as a basic interdisciplinary concern.

Programme Scientific Outcomes (PSOs):

PSO 1: Remember and understand the fundamental concepts of organic, inorganic, physical, analytical chemistry and biology.

PSO 2: Analyze and apply the principles of analysis and hands on training of different advanced and commonly used analytical equipment for qualitative, quantitative and synthetic laboratory exercises.

PSO 3: Be able to combine the theoretical and practical knowledge for entrepreneurship, research and development and societal benefits.

Mode of Evaluation:

After the completion of course, written examination will be taken for 50 Marks and a project submission will be conducted for 50 Marks. On the basis of marks obtained for written examination and viva, the results will be prepared. The grades are as follows:

Level	Excellent	Very Good	Good	Above Average	Average	Below Average	Poor	Fail
Grade	AA	A+	A	B+	B	C	D	E
Marks Range	90 & Above	80 & Above	70 & Above	60 & Above	50 & Above	40 & Above	30 & Above	Below 30