

BSBT 104 Biochemistry and Instrumentation

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BSBT 104	DC	Biochemistry and Instrumentation	60	20	20	40	20	1	1	2	7

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

*Teacher Assessment shall be based following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. To have the knowledge of chemical nature of important biomolecules
2. To know the principles of techniques and instruments used in biological laboratories

Course Outcome:

1. Students will be able to understand the chemical nature of biomolecules and their physical and chemical properties
2. Students will be familiar with the analytical techniques and the working principles of the instruments used in biological laboratories

A. Biochemistry**Unit-I**

Structure, classification and function of Carbohydrates and Lipids
Structure and types of DNA and RNA

Unit - II

Structure, classification and function of Amino acids and Proteins
Structure and function of vitamins

Unit-III

Enzymes - Classification, Energy of activation and Enzyme kinetics, Michaelis - Menten equation.

Cofactors and coenzymes; Isozyme, ribozyme and abzymes

Allosteric enzymes


Joint Registrar

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

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B.Sc. (Life Science / Biotechnology / Chemistry)

B. Instrumentation

Unit - IV

Light Microscopy (bright field, dark field), Phase contrast and Fluorescence.
Electron Microscopy (SEM and TEM)

Spectroscopy: Beer Lambert's Law, Colorimeters, UV and Visible spectroscopy, Flame photometer.

Unit - V

Chromatography: Paper, Thin layer, Ion exchange, affinity and Gel filtration
Electrophoresis: Agarose gel, SDS PAGE and Native PAGE.
Centrifugation: Basic principles, preparative and analytical centrifuges
Radioactivity: autoradiography, Geiger counter and Scintillation Counter.

BSBTL106 Practical:

1. Qualitative and Quantitative [Nelson Somogyi's/DNS method] estimation of carbohydrates.
2. Qualitative and Quantitative [Folin Lowry's method] estimation of Proteins.
3. Determination of the enzyme activity by colorimetric methods.
4. Effect of temperature on the activity of the given enzyme.
5. Effect of pH on the activity of the given enzyme.
6. Effect of enzyme concentration on the activity of the given enzyme.
7. Effect of substrate concentration on the activity of the given enzyme and determination of V_{max} and K_m .
8. Determination of concentration of DNA by DPA method.
9. Determination of concentration of RNA by Orcinol method.
10. Separation of leaf pigments by paper chromatography.
11. Separation of aliphatic, aromatic and polar amino acids by TLC.
12. Isolation of biomolecules from natural sources.
13. Agarose gel electrophoresis of DNA/RNA sample.
14. Separation of proteins on the basis of size by SDS-PAGE.

Books:

1. Principles of Biochemistry. Lehninger, Nelson and Cox (Worth).
2. Biochemistry Stryer, W.H. Freeman.
3. Harper's Biochemistry, McGraw-Hill.
4. Zubey GL, Parson WW and Vance DE, Principles of Biochemistry - W.M.C. Brown Publishers, Oxford, England
5. Fundamentals of Biochemistry, Jain, J.L.,
6. Biochemical Methods of Analysis: *Theory and Applications*, SarojDua, S., Garg, N. Narosa Publishing House.
7. Biochemistry, Sharma, D.K, Narosa Publishing House
8. Experiments in Biotechnology - Nigohkar and Nigohkar

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