



Dr. Bhimrao Ambedkar University Agra

Department of Biotechnology
School of Life Sciences, Khandari Campus

Value Added Courses

Course Name	Protein Engineering
Course Code	BT-VAC-02
Duration & Credit	30 Hrs. & 2 Credits
Coordinator	Dr. Monika Asthana, Assistant professor
Evaluation	By the Coordinator
Organized by	Department of Biotechnology, SLS, Dr. Bhimrao Ambedkar University Agra

Course objectives:

After successful completion of the course student will learn the basic techniques and principles of proteins isolation, separation and purification.

Syllabus

UNIT I

An overview of protein isolation: Properties of proteins, the conceptual basis of protein isolation. Protein purification table.

UNIT II

Extraction and sub-cellular fractionation: Phenol extraction methods, TCA/Acetone precipitation, Ammonium sulphate precipitation, centrifugal sub-cellular fractionation.

Concentration of the extract and Quantification: Freeze drying, dialysis, ultrafiltration, concentration/fractionation by salting out, fractional precipitation with polyethylene glycol, protein quantification- Lowry's method, Bradford assay.

UNIT III

Electrophoresis techniques and blotting: Principles of electrophoresis, the effect of the buffer, electroendosmosis, SDS polyacrylamide gel electrophoresis (SDS-PAGE), Two-dimensional gel electrophoresis (2D-PAGE), Isoelectric focusing, Blotting technique-Western Blotting.

TEXT BOOKS:

1. A guide to protein isolation, Clive Dennison, kluwer academic publishers new york, boston, dordrecht, london, Moscow, 2002.
2. Protein Purification Applications, S.L.V. Harris and Angal IRL Press, (1990).
3. Membrane Protein Purification and Crystallization, Carola Hunte, Gebhard von Jagow and Hermann Schagger, Academic Press (2011).
4. Creighton TE, Chasman DI (1997) Protein structure: a practical approach; IRL press Oxford
5. Branden and Tooze (1999) Introduction to Protein Structure (2nd Edition) Garland Publishing
6. Protein Purification: Principles and Practice (Springer Advanced Texts in Chemistry) by Robert K. Scope (1983)
7. Protein Purification Techniques: A Practical Approach (Practical Approach Series) by Simon Roe (2001)

Course Outcomes (Cos):

On completion of this course, students will able to:

- CO1: Learn about isolation of protein.
CO2: Learn about extraction and quantification of proteins
CO3: Knowledge of separation and purification of proteins.

Monika

DEAN
Faculty of Life Science
Dr. Bhimrao Ambedkar University, Agra