AMFT17 BIOCHEMICAL ENGINEERING FOR FOOD TECHNOLOGISTS

UNIT-1 INTRODUCTION TO ENZYME

1.1 Classification of enzymes.
1.2 Mechanisms of enzyme action;
1.3 Concept of active site and energetic of enzyme substrate complex formation;
1.4 Specificity of enzyme action;
1.5 Principles of catalysis- collision theory, transition state theory;
1.6 Role of entropy in catalysis.

UNIT-2 KINETICS OF ENZYME ACTION

2.1 Kinetics of single substrate reactions;
2.2 Estimation of Michelis- Menten parameters, multisubstrate reactions-
2.3 Mechanisms and kinetics; turnover number;
2.4 Types of inhibition & models- substrate, product.
2.5 Allosteric regulation of enzymes,
2.6 Monod changeuxwyman model, ph. and temperature effect on enzymes & deactivation kinetics.

UNIT-3 ENZYME IMMOBILIZATION

3.1 Physical and chemical techniques for enzyme immobilization- adsorption, matrix entrapment, encapsulation, cross-linking, covalent binding etc., - examples,
3.2 Advantages and disadvantages.

UNIT-4 OVERVIEW OF FERMENTATION PROCESSES

4.1 Overview of fermentation industry, general requirements of fermentation processes,
4.2 Basic configuration of fermentor and ancillaries,
4.3 Main parameters to be monitored and controlled in fermentation processes.

UNIT-5 RAW MATERIALS AND MEDIA DESIGN FOR FERMENTATION PROCESS

5.1 Criteria for good medium, medium requirements for fermentation processes,
5.2 Carbon, nitrogen, minerals, vitamins and other complex nutrients, oxygen requirements,
5.3 Medium formulation of optimal growth and product formation,
5.4 Examples of simple and complex media,
5.5 Design of various commercial media for industrial fermentations – medium optimization methods

References Books

1 Palmer, Trevor “Enzymes: Biochemistry, Biotechnology, Clinical Chemistry”, Affiliated East West Press Pvt. Ltd., 2004.