B.Sc Biotechnology: Semester-VI BST 603: Industrial Biotechnology	
Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	**Examination Scheme** Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: - BST404 Enzymology, BST504 Bioprocess Technology

Course Objectives:

1 To develop an understanding of the various aspects of Bioprocess Technology

2. Understand principles underlying design of Fermentor, Fermentation Process and downstream processing

3. To develop skills associated with screening of Industrially Important Strains.

4. To explain the importance of fermentative productions like Enzymes, antibiotics, vitamin, beverages.

5. To explain and emphasize on the recovery and purification of biomolecules

Course Outcomes:

After completing the course, students will be able to:

CO1: To define the basics of fermentation technology.
CO2: To understand the traditional as well as modern methods of fermentation technology.
CO3: To determine the basic concepts of Upstream and Downstream processing.
CO4: To analyze Fermentative productions like Enzymes, antibiotics, vitamin, beverages.
CO5: To evaluate the production of primary and secondary metabolites.
CO6: To explain and learn the concept of producing industrial Enzymes, Bio-pesticides, Bio-fertilizers, Bio-preservatives, Biopolymers Biodiesel.
CO7: To create recombinant proteins having therapeutic and diagnostic applications, vaccines. Bioprocess strategies in Plant Cell and Animal Cell culture

Detailed Syllabus:

UNIT-1 Introduction to industrial bioprocess: Fermentation- Bacterial, Fungal and Yeast, Biochemistry of fermentation. Traditional and Modern Biotechnology- A brief survey of organisms, processes, products. Basic concepts of Up-stream and Downstream processing in Bioprocess, Process flow sheeting – block diagrams, pictorial representation.
UNIT-2 Production of primary metabolites: Primary Metabolites- Production of commercially important primary metabolites like organic acids, amino acids and alcohols. Production of secondary metabolites: Secondary Metabolites- Production processes for various classes of secondary metabolites: Antibiotics, Vitamins and Steroids.

Dean
Faculty of Science
Invertis University, Bareilly (U.P.)

Head
Department of Biotechnology
Invertis University, Bareilly

Registrar
Invertis University
Bareilly

UNIT-3

Production of enzymes and other bio-products: Production of Industrial Enzymes, Bio-pesticides, Bio-fertilizers, Bio-preservatives, Biopolymers Biodiesel. Cheese, Beer, SCP & Mushroom culture, Bioremediation. Production modern biotechnology products: Production of recombinant proteins having therapeutic and diagnostic applications, vaccines. Bioprocess strategies in Plant Cell and Animal Cell culture.

Text and Reference Books

1. Satyanarayana, U. "Biotechnology" Books & Allied (P) Ltd., 2005.
2. Kumar, H.D. "A Textbook on Biotechnology" 2 nd Edition. Affiliated East West Press Pvt. Ltd., 1998.
3. Balasubramanian, D. etal., "Concepts in Biotechnology" Universities Press Pvt.Ltd., 2004.
4. Ratledge, Colin and Bjorn Kristiansen "Basic Biotechnology" 2 nd Edition Cambridge University Press, 2001. v
5. Dubey, R.C. "A Textbook of Biotechnology" S.Chand& Co. Ltd., 2006.

Head
Department of Biotechnology
Invertis University, Bareilly (U.P.)

Dean
Faculty of Science
Invertis University, Bareilly (U.P.)

Registrar
Invertis University
Bareilly