

**OEC1: Biotechnology for Human Welfare**  
**IA: 40**

**Total Contact Hrs: 42Hrs**  
**SEE: 60**

**(3 CREDITS)**

**Unit – 1: Industry**

**10Hrs**

Application of biotechnology in industry: Industrial production of alcoholic beverage (wine), antibiotic (Penicillin), enzyme (lipase) Protein engineering applications in food, detergent and pharmaceutical industry.

**Unit – 2: Environment**

**8 Hrs**

Application of biotechnology in environmental aspects: Degradation organic pollutants - chlorinated and non-chlorinated compounds; degradation of hydrocarbons and agricultural wastes, PHB –production and its futuristic applications.

**Unit – 3: Forensic science**

**8 Hrs**

Application of biotechnology in forensic science:  
Solving crimes of murder and rape; solving claims of paternity and theft by using DNA finger printing techniques.

**Unit – 4: Health science**

**8 Hrs**

Health Application of biotechnology in health: Genetically engineered insulin, recombinant vaccines, gene therapy, molecular diagnostics using ELISA, PCR; monoclonal antibodies and their use in cancer; human genome project.

**Unit – 5: Food science**

**8 Hrs**

Quality Factors in Pre-processed Food, Microbial role in food products (Yeast and Bacterial based process and products).

## **Course Outcome (COs):**

### **At the end of the course the student should be able to:**

- CO 1:** To understand biotechnological application in deriving products from microbes, plant and animal sources as well as the challenges of extracting compounds in a Comprehensive Product Development Plan.
- CO 2:** To understand the biotechnological in understanding and protecting the environment mainly through the development of biodegradable polymer.
- CO 3:** To get the basics of forensic science in solving crimes, paternity testing using DNA finger printing technique.
- CO 4:** To explore the scope and role of Medical Biotechnology in healthcare industry such as multiple uses of antibodies and vaccines.

### **Text Books / References**

1. Crueger W and Crueger A. (2000). Biotechnology: A textbook of Industrial Microbiology. 2nd edition. Panima Publishing Co. New Delhi.
2. Patel AH. (1996). Industrial Microbiology. 1st edition, Macmillan India Limited.
3. Stanbury PF, Whitaker A and Hall SJ. (2006). Principles of Fermentation Technology. 2nd edition, Elsevier Science Ltd.
4. Environmental Biotechnology, Pradipta Kumar Mohapatra
5. Environmental Biotechnology – Concepts and Applications, Hans-Joachim Jordening and Jeseef Winter
6. B.B. Nanda and R.K. Tiwari, Forensic Science in India: A Vision for the Twenty First Century, Select Publishers, New Delhi (2001).
7. M.K. Bhasin and S. Nath, Role of Forensic Science in the New Millennium, University of Delhi, Delhi (2002).
8. S.H. James and J.J. Nordby, Forensic Science: An Introduction to Scientific and Investigative Techniques, 2nd Edition, CRC Press, Boca Raton (2005).
9. W.G. Eckert and R.K. Wright in Introduction to Forensic Sciences, 2nd Edition, W.G. Eckert (ED.), CRC Press, Boca Raton (1997).

