OPEN ELECTIVE- SEM I: Biotechnology for Human Welfare

OPEN ELECTIVE: Biotechnology for Human Welfare	**42Hrs**
Unit 1: Industry	**10Hrs**
An overview of application of biotechnology in industry; Enzymes for textile industry, breweries and food food supplements: single cell proteins, vitamins. food processing: cheese, yoghurt making, Biodegradable plastics, biofuels.	
Unit 2: Environment	**8Hrs**
Application of biotechnology in environmental aspects: Waste management, biodegradation of heavy metals, water cleaning, removing of oil spills, bioremediation, air and soil pollution and biomining.	
Unit 3: Forensic science and health	**14Hrs**
Forensic science: Application of biotechnology in forensic science: Solving crimes by using DNA finger printing techniques **Health** Antibiotic production, molecular diagnostics, Vaccines and vaccine delivery, recombinant therapeutics- Insulin, gene therapy. human genome project	
Unit 4: Application in livestock improvement	**10Hrs**
Transgenic animals, clones, Animal vaccine production, increased milk production, artificial Insemination, poultry and fisheries.	

Reference:

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 Jesef 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).