

MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

B. Sc. BIOTECHNOLOGY III YEAR TDC (2016-17)

Paper IV : *Biotechnology in Human and Animal Health*

Unit-I

Transgenic animals – methods of obtaining transgenic animals using fertilized eggs and embryonic blastocyte cells (examples). Importance of transgenic animals- increased productivity of domestic animals, improved desired characters of domestic animals, production of proteins for pharmaceutical use with special reference to insulin production.

15 Credit hours

Unit-II

Animal cloning and its importance. Methods of cloning in animal systems such as rat, sheep, pig and fish. Animal models for tackling human diseases : Gene knock out and mice models. Transgenic silkworms.

15 Credit hours

Unit-III

Gene therapy and cell mediated therapy. Genetic diseases targeted for gene therapy, Use of genetically modified and humanized antibodies against cell surface antigens in cancer treatment and organ transplantation, importance of Adenosine deaminase (ADA) gene in curing severe combined immuno deficiency (SCID)

15 Credit hours

Unit-IV

Diagnostics : application of immunological and molecular diagnostic methods (RIA, ELISA, PCR, DNA fingerprinting) in forensic medicine and disease diagnostics. Immune system and vaccine, development of vaccines for Hepatitis, Rabies, Herpes and Tuberculosis using recombinant DNA technology, peptide vaccines, vector vaccines, Edible vaccines.

15 Credit hours

Unit-V

An elementary account of genomics and proteomics, human genome project – its inception and outcome. Regulating the use of biotechnology for human and animal health. Intellectual Property Rights (IPR) and biosafety issues. Ethical and moral issues. Current legislation for use of genetically modified organisms. Patenting biotechnological inventions.

15 Credit hours

Suggested Readings

1. Primrose, S.B. Molecular Biotechnology. Panima.
2. Watson and Zoller. Recombinant DNA. Panima.
3. Winnacker. An introduction to Gene Technology – From genes to clones. VCH.
4. Boylan, M. Genetic engineering – science and ethics on new frontier. Pearson Edu.
5. Old and Primrose. Principles of Gene Manipulation.
6. Glick and Pasternak. Molecular Biotechnology. ASM Press Washington, USA.
7. Mickloss, D.V. and Freyer, G.A. DNA Science : A first course in recombinant technology. Cold Spring Harbor Laboratory Press, New York.