

KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS 2019 - 2022)
B.Sc. ZOOLOGY III Year
SEMESTER – V

IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

Theory	4 Hours/Week	4 Credit	Internal marks = 20
Practical	3 Hours/Week	1 Credit	External Marks = 80

UNIT – I

1.1 Basics of Immune system

- 1.1.1 Cells of the Immune system and the Lymphoid organs (Primary and Secondary)
- 1.1.2 First line of defences-physical and chemical barriers; second line of defences – inflammation and phagocytosis.
- 1.1.3 Types of Immunity- Inherent (Active and Passive) and Acquired Immunity (Active and Passive) Humoral and Cell mediated immunity.
- 1.1.4 Major Histocompatibility complex (MHC)- structure and function of class I and Class II proteins. Significance of MHC in organ transplantation; MHC restriction

UNIT – II

2.1 Antibodies and Antigens and Immune system diseases

- 2.1.1 Antibodies(Immunoglobulins) – Structure, functions and classification, antibody diversity, Monoclonal antibodies and applications
- 2.1.2 Antigens structure, antigenic determinants/epitopes, haptens, adjuvants and antigenicity.
- 2.1.3 Antigen-antibody reactions; Agglutination; Precipitation, Opsonization, Cytotoxicity
- 2.1.4 Hypersensitivity reactions.
Autoimmunity and Immunodeficiency diseases.

Unit – III

3.1 Animal Biotechnology and Genetically modified organisms

- 3.1.1 Concept and Scope of Animal Biotechnology
- 3.1.2 Recombinant DNA Technology and its applications.
- 3.1.3 Cloning Vectors- Plasmids, Cosmids and shuttle vectors, Cloning methods(Cell, Animal and Gene cloning); Restriction enzymes and Ligases
- 3.1.4 Transgenesis – Methods of Transgenesis
Production of Transgenic animals- Sheep and Fish

Unit – IV

4.1 Applications of Biotechnology

- 4.1.1 In vitro fertilization and embryo transfer
- 4.1.2 Hybridoma technology – concepts and applications
- 4.1.3 Stem cells- Types and their applications
- 4.1.4 Recombinant insulin and human growth hormone; Polymerase Chain Reaction (PCR)
Animal Bioreactors- Concepts and Applications.


HEAD
Department Of Zoology
University College
Kakatiya University,
WARANGAL.-506009(T.S)


DR. G. SHAMITHA
Chairperson
Board of Studies
Department of Zoology & Sericulture Unit
KAKATIYA UNIVERSITY - WGL-506009 (T.S)

Suggested Readings:

1. Text Book of Immunology – Ivan Riott
2. Text Book of Immunology – C.V.Rao
3. Text Book of Immunology – Nandinin Shetty
4. Text Book of Immunology – Kubey
5. Culture of Animal Cells – R. Ian Freshney, Wiley Liss
6. Biotechnology – S. Mitra
7. Animal Cell Culture - Practical Approach – Ed. John. RW. Masters, Oxford
8. Biotechnology – B.D.Singh
9. Brown, T.A. (1998). *Molecular Biology Labfax II: Gene Cloning and DNA Analysis*. II Edition, Academic Press, California, USA.
10. Glick, B.R. and Pasternak, J.J. (2009). *Molecular Biotechnology - Principles and Applications of Recombinant DNA*. IV Edition, ASM press, Washington, USA.


HEAD
Department Of Zoology
University College
Kakatiya University.
WARANGAL.-506009 (T.S.)


DR. G. SHAMITHA
Chairperson
Board of Studies
Department of Zoology & Sericulture Unit
KAKATIYA UNIVERSITY - WGL-506009 (T.S.)

KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS 2019 - 2022)
B.Sc. ZOOLOGY III Year
SEMESTER – V

IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY
PRACTICAL

Instruction: 3 hrs per week

No. of Credits: 1

I. Immunology

1. Identification of Blood grouping (Demonstration of Agglutination) using kit.
2. Demonstration of Precipitation (VDRL/RPR) using kit.
3. Histological study of Lymphoid organs -Spleen, Thymus, Lymph node, Bone marrow (through prepared slides).
4. Enumeration of Total RBC from a given blood sample.
5. Enumeration of Total WBC from a given blood sample.
6. Enumeration of Differential count of WBC from a given blood sample.

II. Animal Biotechnology

1. Study the following techniques through Photographs / Virtual Lab

- a) Identification of Vectors
- b) Identification of Transgenic animals
- c) DNA sequencing (Sanger's method)
- d) DNA finger printing
- e) Southern blotting
- f) Western blotting

2. PCR (demonstration) on site or of site demonstration.

- **Laboratory Record work shall be submitted at the time of practical examination**
- **Computer aided techniques should be adopted as per UGC guide lines.**

Suggested manuals:

1. A Hand Book of Practical Immunology – **Ivan Riott**
2. Animal Biotechnology – **P.K. Gupta.**
3. Immunology, VI Edition. W.H. Freeman and Company **Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2006).**
4. Immunology, VII Edition, Mosby, Elsevier Publication **David, M., Jonathan, B., David, R. B. and Ivan R. (2006).**
5. Cellular and Molecular Immunology. V Edition. Saunders Publication, **Abbas, K. Abul and Lechtman H. Andrew (2003.)**


HEAD
Department Of Zoology
University College
Kakatiya University,
WARANGAL.-506009(T.S)


DR. G. SHAMITHA
Chairperson
Board of Studies
Department of Zoology & Sericulture Unit
KAKATIYA UNIVERSITY - WGL-506009 (T.S)