

**UNIVERSITY OF MYSORE**  
**M. Sc in Genetics**  
**Syllabus for Entrance Test (2014-15)**

- Unit I:** Mendel and his experiments - Mendelism. Extension of Mendelism - Interaction of genes (Complementary factors, Supplementary factors, Epistasis and Hypostasis), Linkage and Crossing over, Sex linked inheritance. Cytoplasmic inheritance, Sex determination in *Drosophila*, Melandrium and Man; Human Syndromes.
- Unit II:** Gene concept: Classical (Mendelian factors, Cistron, Recon, Muton) and Modern Concept (transposons, split-genes), Operon concept of gene regulation, Inborn errors of metabolism
- Unit III:** Cell cycle, Mitosis and Meiosis, synaptonemal complex. Fine structure of eukaryotic chromosomes, Polytene and Lampbrush chromosomes. Structural and numerical changes in chromosomes.
- Unit IV:** Ultrastructural organization of cell - Structure and Functions of cell organelles.
- Unit V:** Experiments of Griffith, Avery, MacLeod and McCarthy; Structure of DNA and Semi-conservative replication of DNA, structure of RNA, Types of RNA and their functions. Transcription & Translation - initiation, elongation and termination. Post-transcriptional modifications of eukaryotic mRNA, Genetic code.
- Unit VI:** Gene mutations: Mutagens, Spontaneous and Induced mutations. Detection of mutations by CIB technique.
- Unit VII:** Developmental biology: Fertilization, cleavage patterns, blastula, gastrula, primary organizer.  
Immunology: Innate and adaptive immunity, cell mediated immunity, humoral immunity, structure of immunoglobulin, autoimmune diseases (serum sickness, rheumatoid arthritis), MHC molecules, AIDS.
- Unit VIII:** Cancer biology: Types, characteristics of cancer cell, benign and malignant cancer, carcinogens (physical, chemical, biological), cancer therapy
- Unit IX:** Evolution: Darwinism, Neo-Darwinism, gene pool, Hardy-Weinberg law, genetic drift, gene flow, geographical and reproductive isolation, bottle neck phenomenon, natural selection and speciation, evidences of evolution.
- Unit X:** Tools and techniques of genetic engineering, vectors (plasmid, cosmid, bacteriophage), enzymes used in recombinant DNA technology, host cells, types of bioreactors, transgenic plants and animals.

---

**Note:**

1. **Duration of entrance exam:** 60 min.
2. **Pattern of question paper:** 50 multiple choice questions of 1 mark each, to be answered in OMR sheets.
3. **Eligibility for writing entrance exam:** The candidates must have studied any Bachelor degree in Life science including Medicine, Pharmacy, Dental, BE in Biotechnology,

Agriculture and Veterinary Sciences from any University/Institution recognized by UGC/ ICAR/AICTE/Medical Council. The candidates must have completed bachelor degree with an aggregate of 45% marks excluding languages (40% in case of candidates belonging to SC & ST category).

4. **Eligibility for admission:** The marks scored in the entrance test and 50% marks of the bachelor degree examination (excluding languages) will be considered for preparing the merit list at the time of admission.