| | | | | | |
|---|---|---|---|---|---|
| | | ▪ **25. Hematology**<br>▪ **Focus:** Blood disorders.<br>▪ **Conditions:** Anemia, clotting disorders, and leukemia.<br>▪ | | | |
| 11 | | Final exam | 1 | 2 | a1, a2, b1, |
| | **Number of Weeks /and Units Per Semester** | | 16 | 32 | |

# Template for Course Plan (Genetics)

## II. Course Description:

This course provides an overview of the principles and techniques of molecular biology and genetics. It covers topics such as DNA replication, transcription, translation, genetic regulation, genetic engineering, and genomics.

## V. Course Content:

### A – Theoretical Aspect:

| NO. | Units/Topics List | Sub Topics List | Number of Weeks | Credit Hours | |
|---|---|---|---|---|---|
| 1 | Introduction to Molecular Biology and Genetics | - Definition of Molecular Biology and Genetics<br>- Historical Development of Molecular Biology and Genetics<br>- The Central Dogma of Molecular Biology<br>- Research Methods in Molecular Biology and Genetics | 1 | 2 | |
| 2 | DNA Structure and Replication | -DNA Structure and Function<br>-DNA Replication Mechanisms<br>-DNA Repair Mechanisms | 1 | 2 | |

| | | | | | |
|---|---|---|---|---|---|
| | | -DNA Recombination | | | |
| 3 | Transcription and RNA Processing | - RNA Structure and Function<br>- Transcription Mechanisms<br>- RNA Processing<br>- RNA Editing | 1 | 2 | |
| 4 | The Central Dogma of Molecular Biology<br>The flow of genetic information<br>The replication of DNA<br>The transcription of DNA into RNA<br>The translation of RNA into protein<br>Translation and Protein Synthesis | - Protein Structure and Function<br>- Translation Mechanisms<br>- Post-Translational Modifications<br>- Protein Folding and Quality Control | 1 | 2 | |
| 5 | Genetic Regulation | - Gene Expression Regulation<br>- Transcriptional Regulation<br>- Post-Transcriptional Regulation<br>- Epigenetics | 2 | 4 | |
| 6 | Med tem exam | | 1 | 2 | |
| 7 | Genetic Analysis | - Mendelian Genetics<br>- Pedigree Analysis | 2 | 4 | |

| | | | | | |
|---|---|---|---|---|---|
| | | - Linkage and Mapping<br>- Quantitative Genetics | | | |
| 8 | Genetic Engineering | - Restriction Enzymes and DNA Cloning<br>- Polymerase Chain Reaction (PCR)<br>- Gene Editing Technologies<br>- Transgenic Organisms | 2 | 4 | |
| 9 | Genomics | - Genome Sequencing<br>- Genome Annotation<br>- Comparative Genomics<br>- Functional Genomics | 2 | 4 | |
| 10 | Ethical and Legal Issues in Molecular Biology and Genetics | - Ethical Issues in Genetic Research<br>- Genetic Counseling and Testing<br>- Intellectual Property Rights<br>- Regulation of Genetic Engineering | 2 | 4 | |
| 11 | FINAL THEORTICAL | | 1 | 2 | |
| | | | 16 | 32 | |