

## M.Sc. Molecular and Human Genetics

### OBJECTIVE:

To prepare competent manpower with sound knowledge in genetics.

To give quality education of genetics and to prepare manpower with excellent skills and moral and ethical values.

**DURATION OF COURSE:** 2 Years.

### ELIGIBILITY CRITERIA:

- 1) M.B.B.S. or M.D./M.S. in Anatomy, Paediatrics, OB.& Gyn., Pathology.
- 2) M.Sc. Anatomy,
- 3) B.Sc. or M.Sc. - Biotechnology / Microbiology / Zoology / Biochemistry / Life Sciences

### INSTRUCTIONS:

Admissions will be purely on merit basis by taking entrance examination which will include objective type of questions.

### CURRICULUM:

**Semester - I: Introduction**

<b>THEORY</b>	<b>30 Hrs</b>
1. Introduction to cell and cell organelles	5 Hrs.
2. Cell division	3 Hrs.
3. Structure and Function of Chromosomes	4 Hrs
4. Classification	5 Hrs
5. Karyotyping	13 Hrs.

  

<b>PRACTICAL</b>	<b>60 Hrs.</b>
1. Introduction	3 Hrs
2. Chemical	10 Hrs.
3. Procedure	10 Hrs.
4. Instruments	7 Hrs.
5. Incubation & Media	10 Hrs.
6. Photography	10 Hrs.

At the end of Semester - I, 1<sup>st</sup> Terminal Exam will be taken.

**Semester - II: Gene, Types of genes, Chromosomal aberrations, (Structural, Numerical), Multiple alleles.**

<b>THEORY</b>	<b>30 Hrs.</b>
1. Gene	5 Hrs.
2. Classification	5 Hrs.
3. Chromosomal Aberrations	5 Hrs.
4. Structures with Syndrome	5 Hrs.
5. Numerical with Syndrome	5 Hrs.
6. Genetical Inheritance	5 Hrs

**PRACTICAL** **60 Hrs.**

- |   |         |
|---|---------|
| 1. Identification of Individual Chromosomes | 20 Hrs. |
| 2. Slicing and preparing Karyotype          | 20 Hrs. |
| 3. Interpretation                           | 20 Hrs. |

At the end of II Semester, Annual Examination will be conducted

**Semester - III: Genetic Counseling.**

**THEORY** **30 Hrs.**

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|---|---------|
| 1. Antinatal Identification                 | 10 Hrs. |
| 2. History taking, Punnets chart Predigree. | 10 Hrs. |
| 3. Communication skill & ethical aspect     | 10 Hrs. |
| 4. Application of knowledge for counseling. |         |

**PRACTICAL** **60 Hrs.**

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|--|---------|
| 1. Hand on Practice for minimum 60 specimens and interpretation under supervision. |         |
|  | 60 Hrs. |

At the completion of III rd Semester IInd terminal examination will be taken.

**Semester - IV: Recent advances in Genetics.**

**THEORY** **30 Hrs.**

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|---|--------|
| 1. Recombinant DNA                        | 6 Hrs. |
| 2. FISH Technique                         | 6 Hrs. |
| 3. Revese banding                         | 6 Hrs. |
| 4. Human genome, Stem Cells, Gene Therapy | 6 Hrs. |

**PRACTICAL** **60 Hrs.**

- |  |        |
|--|--------|
| 1. Hand on practice for 60 specimens independently with practicals on recent advances. |        |
|  | 60 Hrs |

**EVALUATION:**

- I. Terminal - at the end of First Semester.
- II. Year annual - at the end of Second Semester.
- III. Year term inal - at the end of Third Semester.
- IV. Year Final- at the end of Fourth Semester.

**Terminal Exams both I & III**

**Theory** **50 Marks.**

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|----------------|-----------------------------|
| Q.1. 25 M.C.Q. |                             |
| Q.2.           | 15 Short Notes (3 out of 4) |
| Q.3.           | 10 F.Q.                     |

**Practical** **50 Marks.**

## **1<sup>st</sup> Annual Examination and Final examination**

Theory - 100 Marks.

Practical - 100 Marks.

For Annual and Final Examination two examiners will be appointed One Internal and One External preferably out of state.

### **BOOKS RECOMMENDED:**

- 1) Elements of Medical Genetics - Emery 13<sup>th</sup> edition.  
Churchill - Livingstone, Elsevier publication.
- 2) Genetics in Medicine - Thompson & Thompson.
- 3) Genetics - John R.S. Finchan.
- 4) Practical Genetic Counselling - Peter S. Harper.
- 5) Genetics for Medical Students - 7<sup>th</sup> edition - E.B. Ford.
- 6) Genetics for the clinicians - C.A. Clarke.
- 7) Medical Genetics - Principles & Practice - Nora/Fraser.