



**Department of Genetics, Immunology and Biochemistry  
Maharashtra University of Health Sciences.**

## **INFORMATION BROCHURE**

**For**

**CERTIFICATE COURSE  
IN  
"MEDICAL GENETICS"**

**Pune Regional Centre,  
3<sup>rd</sup> Floor, ESIS Hospital Building,  
Aundh, Pune – 411 027.  
Telefax: 020-2728 0454, 020 2728 5695  
Website: - [www.muhsnashik.com](http://www.muhsnashik.com)**

## **IMPORTANT INFORMATION AT A GLANCE**

1. Six-month weekend course – 2 hours each on Saturday and Sunday.
2. Last date of submission of forms is 31<sup>st</sup> March 2008.
3. Course commences in April 2008.
4. Seats limited to 30 participants.
5. Comprehensive coverage of the theory in Medical Genetics.
6. Lectures by a panel of faculty members, expert in Genetics and Molecular Biology.
7. Clinical case study and discussion included.
8. Project Work
9. Periodic Assessment
10. Successful candidates will be awarded certificate from Maharashtra University of Health Sciences.

# CERTIFICATE COURSE IN MEDICAL GENETICS

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# MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

## DEPARTMENT OF GENETICS, IMMUNOLOGY AND BIOCHEMISTRY

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### 1. Introduction

Genetics is a rapidly advancing science and the major strides that medicine will accomplish in the present century will be made possible by understanding the human genome. The pace of the progress is extremely rapid. If the benefits of this progress are to reach the common man the medical fraternity has to keep abreast of the newly emerging technology.

The subject of Medical Genetics is not given due prominence in the medical curricula. To fill this lacuna the Department of Genetics, Immunology and Biochemistry, Maharashtra University of Health Sciences is starting a certificate course in Medical Genetics. It is envisaged that this course will arm the doctors and the technical people involved in care of patients and families with genetic disorders with the knowledge in genetics from basic concepts to the exciting future prospects like gene therapy.

### 2.Aims

**The course is designed as a primer course both for medical practitioners as well as students pursuing postgraduate degree. The course is going to be useful for clinicians who are dealing with patients and families with genetic disorders in their practice. The course will also serve as the first step to postgraduates of pediatrics, laboratory and basic sciences and other health science disciplines who wish to pursue Human Genetics as a career. The course will also serve as a preparation for competitive exams like GRE, FMG or PLAB**

### **3. Objectives**

- To equip the participants with a strong background in the basic principles of genetics.
- To give additional insights that modern genetics has brought to the field of medicine so far and the course Genetics will follow in future .
- To help participants to become familiar with the techniques in molecular biology.
- To provide participants with the ability to think analytically to arrive at diagnosis and management of common and rare genetic disorders.
- To equip the participants with the principles of genetic counseling.
- To train participants in undertaking research projects in Genetics.

### **4. Eligibility**

This course shall be open to students as follows:

- Bachelor Degree from Medicine ( Allopathy and/or interpathy)
- Bachelor degree in Science subject( BSc in Life Sciences)
- Bachelor degree in Health Sciences like Nursing, Physiotherapy etc.
- Bachelor degree in Medical Laboratory Sciences or Medical Social Work or Psychology.

## **5. Duration of the course**

- a. Six months.

## **6. Language of Course**

English \_

## **7. Total number of Seats**

Seats for this course will be limited to 30 only.

## **8. Nature of Course**

Interdisciplinary, weekend course.

## **9. Fee structure**

**Total Fees For Certificate Course in Medical Genetics are Rs:30,000/- only.**

**Scholarships are offered for deserving candidates.**

- ❖ Students will have to pay examination fees and any other fees applicable as per the latest changes made by MUHS.

## **10. Refund of fees**

- Within 1 week of course commencement – Fees paid less Rs.5000/-
- Within 1 month of course commencement – Fees paid less Rs. 10,000/-

## 11. Application Form & Information Brochure

- Information Brochure along with blank application form is available on the University website ([www.muhsnashik.com](http://www.muhsnashik.com)).
- The candidates are requested to download the application form and send it along with a D.D. of Rs. 500/- in favor of "Registrar, MUHS, Nashik". D.D. should be drawn on any Branch of Nationalized bank payable at Nashik.
- The envelope should be superscripted with "Certificate Course in Medical Genetics".
- The application form must be filled by the candidate in his / her own handwriting using black ball point pen and submit it on or before last date of submission of the application forms on the following address:

Department of Genetics, Immunology and Biochemistry,  
Maharashtra University of Health Sciences,  
3<sup>rd</sup> Floor, ESIS Hospital Building,  
Aundh, Pune – 411 027.

- Following attested photocopies are required to be submitted along with the application form:
  1. SSC Board Certificate (Certificate of age)
  2. HSC Mark sheet
  3. Equivalence Certificate from A.I.U. for NRI (if applicable)
  4. Degree Certificate / Passing Certificate.
  5. P.G. Degree Mark sheet (Mandatory in case of candidates having P.G. Degree).

6. Certificate of additional Qualifications.
7. Affidavit for change of Name (Marriage Certificate/ Copy of Govt. Gazette, if applicable).
8. Brief resume of the candidate.

**Note :** An incomplete application form will be rejected.

## 12. Selection Process

- Eligibility of candidate will be finalized after verification of all original documents.
- The candidate is required to take admission within one week of issuing a letter of selection by paying the fees as outlined in point no.8.
- Decision of selection committee shall be final.
- Selection to the successful candidate will be communicated to the candidate.
- No other communication in this regard will be entertained.

## 13. Disqualification for Admission

- Selected candidates who have cancelled their admission or do not take admission within the stipulated period will be disqualified from the admission process.
- These candidates will have to go through the process of application in the next batch of the course.
- Any false information provided will result in disqualification of the candidate.

#### 14. Attendance

- 80% attendance is compulsory failing which students will not be allowed to appear for the examinations.
- A valid medical certificate is necessary if absence is due to illness.

#### 15. Accommodation

- Students have to make their own residential arrangements.

#### 16. Certificate

- The successful candidates will be awarded certificate by the Maharashtra University of Health Sciences (MUHS).

#### 17. **Teaching Schedule, Modules and Evaluation**

Teaching Schedule and Modules –

- This is a six months weekend course, with two lectures each on Saturday and Sunday.
- The teaching schedule of the course will begin from April 2008.
- Project work will be of four months duration. Each student will complete a project of his/her choice during this period.
- The course comprises of a total of six modules.

Evaluation –

<b>Exam heads</b>	<b>Frequency</b>	<b>Marks</b>
Internal assessment	Conducted every fortnightly	50
Theory exam	Conducted at the end of six months	100
Project viva-voce	Conducted at the end of six months	50

\* Minimum passing 50% in each head

### 18. Academic Calendar of the Course

- The teaching schedule of the course will begin from April 2008.
- Duration of project work is 4 months. Each student will complete a project of his/her choice during this period.
- Final examination will be conducted at the end of the course.

### 19. Teaching and Infrastructure facilities

**Teaching staff:**

➤ **In-house faculty :**

<b>Sr. No.</b>	<b>Name</b>	<b>Qualifications</b>	<b>Designation</b>
1.	Dr. P.S. Gambhir	MD (Paediatrics)	Professor
2.	Dr. Mugdha Potnis-Lele	Ph.D. Genetics	Lecturer
3.	Dr. Pramila Menon	MD (Paediatrics)	Lecturer
4.	Mr. Rajendra Kulkarni	M.Sc. Biochemistry	Lecturer

➤ **Visiting faculty :**

1. Dr. Anita Kar, Director, School of Health Sciences, University of Pune, Pune.
2. Dr. Jayanta Pal, Professor, Department of Biotechnology, University of Pune, Pune.
3. Dr. Deepti Deobagkar, Professor, Zoology, University of Pune, Pune.
4. Dr. Sharmila Bapat, Scientist, National Centre for Cell Sciences, Pune.
5. Dr. Suren Ghaskadbi, Scientist, Agharkar Research Institute, Pune.
6. Dr. Saroj Ghaskadbi, Professor, Department of Zoology, University of Pune, Pune.
7. Dr. Mangesh Bankar, Associate Professor, Department of Biochemistry, Government Medical College, Miraj.
8. Dr. M.G. Deo, Director, Moving Academy of Sciences, Pune.
9. Dr. Anil Jalan, Director Nirman, Vashi, Mumbai.
10. Dr. Ashish Bawadekar, Gastroenterologist, KEM Hospital, Pune.
11. Dr. Vaman Khadilkar, Endocrinologist, KEM Hospital, Pune.
12. Dr. U.V. Wagh, Scientist, IRSHA, Pune.
13. Dr. Prabhakar Ranjekar, Director, IRSHA, Pune.
14. Dr. R.S. Wadia, Neurologist, Ruby Hall Nursing home, Pune.
15. Dr. Pakniker, Scientist, Agharkar Research Institute, Pune.
16. Dr. Manisha Doiphode, Foetal Medicine, Pune.
17. Dr. Rajeshwari Pawar, Gynaecologist, Jehangir Hospital, Pune.
18. Dr. Sanjay Gupte, Gynaecologist, Gupte Hospital, Pune.
19. Dr. Avinash Phadnis, Gynaecologist, Shree Clinic, Pune.

20. Dr. V. Babu Rao, Institute of Immunohaematology, Mumbai.

21. Dr. Jayesh Sheth, Director, Institute of Human Genetics, Ahmedabad.

22. Dr. Mamta Muranjan, Associate Professor, KEM Hospital, Mumbai.

### **Infrastructural facilities:**

- Lecture halls
- Over head projector
- LCD projection system
- Audio system

## **20. Module-wise Syllabus**

### **Module 1: Basics of Genetics**

- Principles of Mendelian Genetics
- Relevance to Humans Genetics: Construction of Pedigrees
- Patterns of inheritance of genetic disorders (Autosomal, dominant, autosomal recessive, Sex-linked inheritance, Pseudoautosomal inheritance, Atypical patterns of inheritance, Mitochondrial inheritance)
- Structure of chromosomes, Cell division Meiosis and mitosis
- Developmental Genetics
- Genetic epidemiology and Population Genetics
- Research Methodology and Biostatistics
- Evidence Based Medicine

## **Module 2: Basics of Human Molecular Biology**

- Molecular and biochemical basis of nucleic acids
- Genome structure and Gene Expression
- Mutations in Human Disease Nature and Consequences
- Mitochondrial Genes

## **Module 3: Genetic disorders**

- Single-gene disorders
- Chromosomal Abnormalities
- Autosomal disorders
- Disorders of Sex chromosomes
- Congenital abnormalities and multifactorial inheritance
- Dysmorphology
- Complex traits and adult onset diseases with a genetic predisposition
- Inborn Errors of Metabolism (Lysosomal storage disorders, Metabolic liver disease, Metabolic encephalopathies)
- Thalassemias and haemoglobinopathies (Haemophilias, Thrombophilias and other haematologic disorders)
- Neuromuscular disorders
- Endocrinopathies (CAH, CH)
- Ophthalmology disorders
- Dyslexias
- Genetics of Deafness
- Autism

- Genodermatosis
- Skeletal dysplasias
- Connective tissue disorders
- Renal Disorders
- Cardiovascular Disorders
- Physiotherapy and Occupational Therapy
- Paediatric surgical correction for surgical anomalies
- Cancer Genetics
- ❖ **Clinical case studies and discussion will be included in this module.**

#### **Module 4: Applications of Genetics and Molecular Biology**

- Screening methods (Newborn screening methods, Prenatal Screening ,at risk Population screening methods)
- Techniques in molecular biology (Molecular Analysis methods, Clinical Cytogenetic methods, Prenatal diagnostics techniques)
- Pharmacogenetics and pharmacogenomics
- Genetic Counselling
- Management of a child with genetic disorder
- Gene therapy
- Transplantation genetics
- Newer approaches to treatment for genetic disorders
- Principles of legal and ethical issues pertaining to genetic services
- Social Problems related to Genetic disorders
- Parent Groups

- Adoption
- Database and Internet searches

## 21. **Final Exam Schedule**

<b>Exam heads</b>	<b>Marks</b>
Internal assessment	50
Theory exam	100
Project viva-voce	50

## 22. **Examination Scheme**

- **Certificate in Medical Genetics** will be conferred to those participants who succeed in the University examination.

- a) Theory examination – Total Marks 100
- b) Internal assessment – Total Marks 50
- c) Project work Viva-voce – Total Marks 50

### **Total Marks for the course – 200 marks**

- 50% passing marks under each heading are required to succeed in the course.

## 23. **Future Prospects**

This certificate course will have the following future prospects for participants –

- Help clinicians in the early diagnosis and intervention in genetic disorders
- Knowledge would be of help in setting up a genetic clinic / Counseling cell
- Future opportunities in the field of Gene therapy and stem cell research.
- Basic knowledge of genetics will useful in competitive exams like GRE, PLAB, ECFMG etc

- This course will be a major stepping stone to enter the field of national and international research.

#### 24. Future Plans of the Department

The Department of Genetics, Immunology and Biochemistry plans to start the following courses, for which this certificate course in medical genetics will be the starting point. :

- Certificate course in Reproductive Genetics
- Certificate course in Molecular Diagnosis (Laboratory oriented course)
- Research programmes designed for the degree of M.Phil. and Ph.D.

#### 25. Reference Books and Journals

##### List of books:

First Author	Title	Year	Publisher	Edition
Emery	Elements of medical genetics	2005	Elsevier	12 <sup>th</sup>
Nussbaum	Genetics in medicine	2004	Elsevier	2 <sup>nd</sup>
Harper	Practical genetic counseling	2004	Arnold	6 <sup>th</sup>
Jones	Recognizable patterns: human malformation	2006	Elsevier	6 <sup>th</sup>
Emery and Rimoin	Principles and practice of medical genetics (3 volumes)	2006	Churchill Livingstone	5 <sup>th</sup>
Clarke Joe	Clinical basis of inborn errors of metabolism	2005	Cambridge University	3 <sup>rd</sup>

##### List of Journals:

- Indian Journal of Human Genetics
- Clinical Genetics
- American Journal of Human Genetics
- American Journal of Medical Genetics
- Journal of Medical Genetics
- European Journal of Human Genetics
- Journal of Genetics, Screening and Health