

SARDAR PATEL UNIVERSITY
Programme: MSc (Genetics)
Semester: III
Syllabus with effect from: June 2010

Paper Code: PS03CGEN02	Total Credits: 4
Title Of Paper: Human Molecular Genetics	

Unit	Description in detail	Weightage (%)
1	Genetic mapping: Genetic and physical map, Genetic markers, Synteny of genes, Assembly of clone contigs, Positional cloning and chromosome walking. Identifying human diseases genes: Principles and strategies, Position-independent and positional cloning. Candidate gene approaches. Studying whole genome: Pulse field gel electrophoresis, Cloning and sequencing of DNA.	25 %
2	Monogenic and polygenic disorders: An overview of the genetic basis of syndromes and disorders: Genetic susceptibility to common diseases, Monogenic and Polygenic diseases with well known molecular pathology Monogenic diseases (Huntington's disease, Neurofibromatosis, Cystic fibrosis, Hemophilia A and B, Trinucleotide repeat expansion mutations). Polygenic diseases (Diabetes mellitus, Obesity and Cancer).	25 %
3	Biochemical Genetics: Inborn errors of metabolism: (Molecular and biochemical pathways in Phenyl ketonuria, Alkaptonuria, Maple syrup urine disease, Albinism, Mucopolysaccharidosis, Lipidosis and Glycogen storage disorders). Human mitochondrial syndromes.	25 %
4	Over view of Human genome projects and its practical implications DNA testing: Screening for unknown mutations, Detection of known mutations. Pharmacogenetics: Definition, drug metabolism, genetic variation revealed solely by the effect of drugs, Hereditary disorders with altered drug response, pharmacogenomics, ecogenetics. Social and ethical issues in medical genetics	25 %

Basic Text & Reference Books:

- Human molecular Genetics, Strachan T. & Read A.P., 3rd edition, published by Garland Science, 2004. 978-0815341840.
- Genetics in medicine by Thompson and Thompson, 7th edition, published by Elsevier Science ISBN: 978-81-312-1819-9.
- Lecture Notes on Molecular Medicine, Bradley J., Johnson D.& Rubenstein D., 2nd edition, published by Blackwell Science, 2001. ISBN: 0632058390.
- Principle of gene manipulation by Primrose, S. B. & Twyman R. M. & Old, R. W. 6th ed. Blackwell Science, USA. ISBN: 0-632-05954-0
- Principles of Genetics by Gardener, Eldon John., Simmons, Michael J., Snustad, D. Peter., 8th Edition, John Wiley & Sons Publications, New York. ISBN: 9971-51-346-3.
- Principles of Genetics-Sinnot, Dunn & Dobzhansky, Tata-McGraw Hill India, New Delhi. ISBN: 978-0070994133
- Genetics 3rd Ed. By M. W. Strickberger, Prentice-Hall of India (P) Ltd, New Delhi, ISBN: 81-203-0949-9.
- Essentials of Human Genetics by S.M. Bhatnagar et al, 4th Edition, (1999), Orient Longman. ISBN: 81-250-1426-8
- Topic related review articles.

