

## **SEMESTER-II (Pool-A)**

### **COURSE NAME : GENETIC DISORDERS AND PERSONALIZED MEDICINE**

**(CHOI-A05)**

**Number of Credit: - 02**

**Maximum marks: 50**

#### **Unit-1**

Genetic basis of Diseases and disorders: Monogenic diseases, Inborn errors of metabolism, Neurogenetic disorders, Genetic disorders of Haemopoetic systems, Genetic disorders of eye, Muscle genetic disorders, Genetic disorders in skeleton and skin, Congenital heart diseases, Learning disorders, Genetics of Infertility, Cognitive disorders, Complex syndromes, Mitochondrial syndromes.

#### **Unit-II**

Aspects associated with the understanding of personalized medicine and precision medicine. *CFTR*, cystic fibrosis, transmembrane regulator; TALEN, transcription activator-like effector nuclease; CRISP-Cas9, clustered regularly interspaced short palindromic repeats-associated endonuclease 9

#### **Unit-III**

Navigating the World of Genomic Medicine, Implications of Genomic Discoveries Beyond the Clinic and Lab, The Genomic and exomic NGS data, alignment and pathway and network establishment Genome-wide Hot-spot detection, Protein Interaction Network Programs

#### **Unit-IV**

Identification of disease-associated variants, cystic fibrosis (CF), Perception of personalized medicine, pharmacogenomics, and genetic testing, Regenerative medicine: Stem cells in therapy: Therapeutic proteins, interleukins, interferons principle, production and application.

## Unit-V

**Unit:-5** Cell and tissue engineering- Characteristics of cells involved in tissue engineering; Types and characteristics of biomaterials. Bioartificial organs (Liver, Heart auricles, Blood vessels & Skin). Nanomedicine: Nanomaterials in medicine, nano robots, DNA based nano devices; Nano medicine in cancer.Future and Challenges in Personalized Medicine.

### Recommended Books:

- 1.Essentials of Genomic and Personalized Medicine Book • 2010
- 2.Medical Biotechnology- Pratibha Nallari, V. Venugopal Rao- Oxford Press
- 3.Introduction to Human Molecular Genetics- J.J Pasternak, John Wiley Publishers
4. Human Molecular Genetics- Tom Strachen and A P Read, Bios Scientific Publishers
5. Human Genetics Molecular Evolution- Mc Conkey
6. Recombinant DNA Technology- AEH Emery
7. Principles and Practice of Medical Genetics, I, II, III Volumes by AEH Edts. Emery
8. Medical Biotechnology 1st Edition- Juditpongracz, Mary Keen
9. Medical Biotechnology by Bernard R. Glick, Terry L. Delovitch, Cheryl L. Pattern.  
ASM press, 2014
10. Molecular Biotechnology-Principles and Applications of Recombinant DNA- 4th  
Edition by Bernard R. Glick, Jacj J. Pasternack, Cheryl L. Pattern