Personalized Medicine

Semester No	Code	Credit Hours
7-8	BI-428	2+1

Course Description

Precision or stratified medicine transforms healthcare from a one size fits all approach to a more tailored disease prevention and personalised treatment approach, that takes into account variability in genes, environment, and lifestyle for each person. This course reviews the key genomic technologies and computational approaches that are driving advances in prognostics, diagnostics, and treatment. Emphasis will return to issues surrounding the context of analysis of genome and proteome in medicine including: what does a physician need to know? what sorts of questions will s/he likely encounter from patients? how should s/he respond?

Text And Material

1. Genomic and Personalized Medicine by Huntington F. Willard, Ph.D. and Geoffrey S. Ginsburg
2. Can Precision Medicine be Personal; Can Personalized Medicine be Precise? By by Y. Michael Barilan, Margherita Brusa, Aaron Ciechanover
3. Progress and Challenges in Precision Medicine by Mukesh Verma and Debmalya Barh

Course Learning Outcomes:

Upon successful completion of the course, the student will be trained in:

1. principles of precision, translational and stratified medicine and the clinical impact of individual molecular and lifestyle variability
2. real benefits of genomics can be anticipated in the near future in terms of new drugs and treatments
3. useful features of alternative genomic technologies today and for the near future

Assessment System

Quizzes	10-15%
Assignments	5-10%
Midterms	30-40%

ESE	40-50%

Week wise Lecture Plan:

Week No	Description	Quizzes	Assignment
1	Introduction & History of Personalized Medicine		
2	The precision paradox - How personalized medicine increases uncertainty • Personalization, Individuation and the Ethos of Precision Medicine,		01
3	When does precision matter? Personalised medicine from the perspective of public health • Concepts of Population Genomics		
4	Human Health and Disease: Interaction Between the Genome and the Environment	01	
5	Clinical Next-Generation Sequencing: Enabling Precision Medicine	02	
6	Enabling Strategies in the Translation of Genomics into Medicine		
7	Genomics and Precision Medicine • The Role of Genomics and Genetics in Drug Discovery and Development		02
8	Phenotyping in Precision Medicine		
9	**MIDTERMS**		
10	Role of Pharmacogenomics in Drug Development	03	03
11	Disease-based genomic and personalized medicine: • Cancer Genetic and Oncology	04	

12	Disease-based genomic and personalized medicine: • Cardiovascular Mediine		
13	Disease-based genomic and personalized medicine: • Metabolic Disease		
14	Disease-based genomic and personalized medicine: • Neuropsychiatric Disease		
15	Disease-based genomic and personalized medicine: • Infectious Disease		
16	The Problematic Side of Precision Medicine	04	04
17	Policy Challenges in Genomic and Personalized Medicine		
18	**END SEMESTER EXAMINATION**		