



Jordan University of Science and Technology
Faculty of Science & Arts
Applied Biological Sciences Department

BIO746 Molecular Diagnosis Of Genetic Diseases

Second Semester 2021-2022

Course Catalog

3 Credit Hours. This course will cover the principles of Molecular Diagnosis which is the process of identifying a disease by studying molecules, such as proteins, DNA, and RNA, in a tissue or fluid. Molecular diagnostics is a new discipline that captures genomic, proteomic and metabolomics expression patterns and uses the information to distinguish between two or more conditions at the molecular level. The conditions under investigation can be human genetic disease or infectious diseases. Molecular diagnostics is not confined to human diseases only but can be applied in different diseases and personalized medicine.

Teaching Method: Blended

Text Book

Title	Essentials of Genomics and Personalised Medicine
Author(s)	Geoffrey S. Ginsburg
Edition	1st Edition
Short Name	Essentials of Genomics and Personalised Medicine
Other Information	

Instructor

Name	Prof. Asem Alkhateeb
Office Location	PH1-L1
Office Hours	Mon : 10:00 - 11:00 Mon : 11:00 - 12:00 Tue : 09:00 - 10:00 Wed : 10:00 - 11:00 Thu : 10:00 - 11:00 Thu : 15:30 - 16:30
Email	asemalkhateeb@just.edu.jo

Class Schedule & Room

Section 1:

Lecture Time: Thu : 14:00 - 15:30

Room: NF38

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	The Foundation of Genomics and Personalised Medicine	From Essentials of Genomics and Personalised Medicine
Weeks 2, 3	Organisation, Variation and Expression of the Human Genome	From Essentials of Genomics and Personalised Medicine
Weeks 4, 5	DNA sequencing for the detection of Human Genome variation	From Essentials of Genomics and Personalised Medicine
Week 6	Genome-Wide Association studies & Genotyping Technologies	From Essentials of Genomics and Personalised Medicine
Weeks 7, 8	Copy Number variation and Human Health	From Essentials of Genomics and Personalised Medicine
Weeks 9, 10	DNA Methylation Analysis: Providing New Insight into Human Disease	From Essentials of Genomics and Personalised Medicine
Weeks 11, 12	DNA Microarray in Biological Discovery and Patients Care	From Essentials of Genomics and Personalised Medicine
Weeks 13, 14	Proteomic: The Deciphering of the Functional Genome	From Essentials of Genomics and Personalised Medicine
Weeks 15, 16	Comprehensive Metabolic Analysis for Understanding of Disease	From Essentials of Genomics and Personalised Medicine

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Explaining how genetic variation can lead to disease and response to treatment [1A]	20%	Practical
Listing and providing examples of different types of genetic aberrations and Classifying the genetic disease types based on the number of genes involved [1A, 1C]	20%	Final Exam
Analyzing genomic sequences, identify variants and predict their potential for causing disease, Distinguishing between pathogenic and non-pathogenic variants, Demonstrating extraction and use of genetic data from open-source databases to interpret the genetic variation in disease and Distinguishing between the role of genotype and environment influences in causing the disease phenotype [1A, 1C, 1D]	30%	Midterm Exam
Describing the state of the art technologies used in the sequencing and molecular diagnostics industry [1A, 1D]	10%	Final Exam

Applying of pharmacogenetic data to predict drug response and Defining what is meant by the term ?personalized medicine? Discuss the feasibility of personalized medicine and identify the major challenges and setbacks in implementing it in the current health care system [1A, 1C, 1D, 1E, 1F]	20%	Final Exam
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Relationship to Program Student Outcomes (Out of 100%)					
A	B	C	D	E	F
49		24	19	4	4

Evaluation	
Assessment Tool	Weight
Midterm Exam	30%
Practical	20%
Final Exam	50%

Policy	
Class attendance	Your class attendance is mandatory. Absences in excess of 20% of the total lecture hours will result in your being dropped from the course with a failing grade
Makeup Exams	Make-up exam appeals should be filed within one week of the missed exam
Cell Phones	Cell phones are completely prohibited during examinations according to the university regulations i.e. you are not allowed to bring your phone into the exam hall
Cell Phones	Cell phones must be turned off during lectures. No incoming or outgoing calls or text messages are allowed
Cheating	Unethical conduct, including cheating during examinations, will result in punishment by the university administration

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