Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Genetics and Bioengineering Department
2024-2025 Fall Semester

Syllabus	
Code/Name	GBM205 / GENETICS
Type	Required
Credit/ECTS	4/4
Hour per Week	3
Level/Year	Undergraduate/2
Semester	Fall
Classroom	MUHD-306
Content	GBM205 Genetic covers transmission genetics comprehensively and introduces molecular genetics.
Prerequisites	N/A
Textbooks	***Primary*** Concepts of Genetics, 9th Edition, Klug, 2019 ***Supplementary*** Genetic Analysis and Integrated Approach, 3rd Edition, Bowman, 2019
Objectives	● To introduce students to fundamental concepts of transmission and molecular genetics. ● To develop student's problem solving skills by applying genetic principles. ● To develop student's practical academic skills through various assignments.
Course Outcomes	CO1. Summarize key concepts of transmission genetics and DNA structure. CO2. Apply genetic principles to solve problems related to inheritance and molecular genetics. CO3. Formulate hypotheses and test their validity using genetic data and analysis. CO4. Perform basic genetic-related database searches and gather relevant data. CO5. Demonstrate the ability to critically assess academic readings in genetic engineering. CO6. Create basic scientific illustrations digitally, accurately representing genetic processes. C07. Work both independently and collaboratively to complete tasks and solve problems.

Weekly Schedule of Topics

W	Topic	Content
1	Introduction to Course	Introducing the lecturer, syllabus evaluation method, rules and expectations
2	Introduction to Genetics	General overview of genetics, key terms, molecular genetics and model organisms
3	Mitosis and Meiosis	Cell cycle, in detail mitosis and meiosis mechanism, spermatogenesis and oogenesis
4	Mendelian Genetics	Mendel postulates, genetic crosses, null hypothesis, chi square analysis
5	Extensions to Mendelian Genetics	Codominance, incomplete dominance, epistasis, pleiotropy, complementation analysis
6	Chromosome Mapping I	Linked genes, recombination, physical mapping of eukaryotic genes and problem solving
7	Chromosome Mapping II	Brief introduction to prokaryote and virus genetics, mapping of prokaryotic genes

8	Sex Chromosomes	Sex determination and sex chromosomes, Lyon hypothesis, sex chromosome linked disorders
9	Chromosomal Variations	Variations in chromosome number, composition and arrangement
10	Extranuclear Inheritance	Organelle heredity, mutations in mitochondrial DNA, maternal effect
11	DNA Structure and Analysis	The structure of DNA and RNA, techniques to investigate DNA and RNA
12	DNA Replication and Recombination	Detailed mechanism of DNA replication and recombination in prokaryotes and eukaryotes
13	DNA Organization in Chromosomes	Viral and bacterial DNA, specialized chromosomes, chromosome organization
14	Gene Mutations and Transposition	Mutation classification, induced mutations, DNA repair systems, transposable elements

Professional Contribution	N/A

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	1	1	1	1	2	1	0	0	0	0	0
CO2	1	1	0	1	0	0	0	0	0	0	0
CO3	1	1	0	1	0	0	0	0	0	0	0
CO4	1	1	1	1	1	0	0	0	0	0	0
CO5	1	1	1	1	1	1	0	0	0	0	2
CO6	0	0	0	0	0	0	2	0	2	0	1
CO7	0	0	0	0	0	0	3	3	1	0	1

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions	N/A
Requirements	N/A
Course Policy	N/A
Cheating & Plagiarism	● Copying or letting someone copy anyone work on exams, assignments, or reports is cheating. ● Cutting and pasting text, figures and tables from web sources, AI or any other electronic source is plagiarism. ● The consequence of academic dishonesty is to receive a grade of **FF** for the course.
Evaluation	Assignments (10x) 30% Midterm Exam 30% Final exam 40% Total 100%
Rubric	N/A

Instructor

Name/Surname	Enes Durgut	Email	**enes.durgut@alanya.edu.tr**
Room	321	Office Hours	Students can arrange meetings through Google Calendar

Prepared by Enes Durgut on October 16th, 2024