MOLECULAR GENETICS
201701 – BIOL 361 - A01 (20353)
January-April 2017

COURSE OUTLINE

LECTURER: JOHN S. TAYLOR

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Lectures: Room: Human & Social Development A240 MTh: 8:30 am – 9:50 am

COURSE DESCRIPTION.

The study of connections between **genes and phenotypes**. It will include wrinkled and round peas, cystic fibrosis in humans, and fins and bristles in sticklebacks and fruit flies respectively. We will also study microsatellites, SNPs, exomes and whole genomes. There will be some very unusual examples of gene duplication and divergence, and of genes emerging from non-coding sequences (*de-novo* genes). We'll end with gene editing.

EVALUATION

1. ASSIGNMENTS: (30 pts)
    a) Reading assignment: Experiments in Plant Hybridization (10)
    b) BLAST: (10)
    c) Phylogenetic Analysis (10)

2. MID-TERM EXAM: (30 pts)

3. FINAL EXAM: (40 pts)

Grading scheme: A+ (90%-100%), A (85-89.9%), A- (80-84.9%), B+ (77-79.9), B (73-76.9%), B- (70-72.9%), C+ (65-69.9%), C (60-64.9%), D (50-59.9%), F (<50%), N

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Lecture schedule*

1	Jan	5	Mendel (**Assignment 1. 10%. Due in one week**)
2		9	Wrinkled and Round Peas Part 1
3		12	Wrinkled and Round Part 2
4		16	Tall and Dwarf Peas
5		19	Purple and White Peas
6		23	Cystic Fibrosis Part 1
7		26	Cystic Fibrosis Part 2
8		30	Sticklebacks Part 1
9	Feb	2	Sticklebacks Part2
10		6	Gene-Environment Interactions (Flies Bristles) Part 1
11		9	Gene-Environment Interactions (Twin Study) Part 2
		13	Reading Break
		16	
12		20	**Midterm Exam (30%)**
13		23	BLAST (**Assignment 2. 10%. Due in one week**)
14		27	Transposable Elements
15	Mar	2	De-Novo genes
16		6	Phylogenetics (**Assignment 3. 10%. Due in one week**)
17		9	Ultra Conserved Elements
18		13	Gene Duplication
19		16	Opsin genes
20		20	Transcriptomes
21		23	Exomes
22		27	CRISPR/Cas-9
23		30	CRISPR/Cas-9
24	Apr	3	Review
			Final Exam (40%)

* Revisions may be made during the semester.