

MOLECULAR EPIDEMIOLOGY
10349 – BIOL 439 - A01
September – December 2015

COURSE OUTLINE

LECTURER:

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Lectures: Room: ELL 060 TWF: 11:30 am - 12:20 pm

COURSE DESCRIPTION. This course will provide an introduction to the basic principles and applications of molecular epidemiology. We focus on the identification of genes that play a role in disease in humans (e.g., using linkage and association studies plus exome and genome sequencing) and the implications of such discoveries for diagnosis, screening, and treatment. Cystic fibrosis, cancer, HIV progression, and the human HapMap are among the subjects covered. A key component of the course is the completion and presentation of semester-long group projects.

EVALUATION

1. ASSIGNMENTS: (45 pts)
 - a) Reading assignment: Pre-implantation genetic diagnosis (5)
 - b) Reading assignment: Genetic polymorphisms and breast cancer (5)
 - c) HapMap assignment: Selecting tagging SNPs (10)
 - d) Research Report (15) and Presentation (10)
2. MID-TERM EXAM: (30 pts)
3. FINAL EXAM: (25 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 (Failure to complete one or more of the following: Research Report, Mid-term exam, final exam).

UVic is committed to promoting, providing and protecting a supportive and safe learning and working environment for all its members.

Lecture schedule*

	September		
1	9	Course Outline and Introductions	
2	11	Exposure and Odds Ratio	Start Assignment 1
3	15	Cystic Fibrosis (CF), Kissing Cousins, LOD Score	
4	16	CF, RFLPs	
5	18	F508del	
6	22	Pre-implantation Genetics Diagnosis	Assignment 1 due
7	23	Gene Therapy	
8	25	Personalized Medicine and CF	Start Assignment 2.
	29	Groups meet in class	
9	30	Linkage, Pedigrees and DNA pooling	
	October		
10	2	Cancer	
11	6	Odds Ratio, Relative Risk, and <i>BRCA1</i> & <i>BRCA2</i>	Assignment 2 due
12	7	SNPs and the Hazard Ratio	
13	9	Tumor Transcription, Exome Sequencing and Cancer Evolution	
14	13	Over-diagnosis	
	14	Midterm	
15	16	HIV-AIDS 1	
16	20	HIV-AIDS 2	
	21	Groups meet in class	
17	23	The HapMap	Start Assignment 3
18	27	Macular Degeneration	
19	28	GWAS (Genome-Wide Association Studies)	
20	30	CRISPR-Cas9	
	November		
21	3	Genome editing	Assignment 3 due
	4	Presentations Begin	

* Revisions may be made during the semester.