

**MOLECULAR EPIDEMIOLOGY**  
**201709 – BIOL 439 - A01 (10411)**  
**September – December 2017**

**COURSE OUTLINE**

**LECTURER: JOHN S. TAYLOR**

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**Lectures:**      Room: Cornett B135 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	<b>6</b>	Exposure and Odds Ratio	Start Assignment 1
2	<b>8</b>	Cystic Fibrosis (CF), Kissing Cousins, LOD Score	
3	<b>12</b>	CF, RFLPs	
4	<b>13</b>	F508del	
5	<b>15</b>	Pre-implantation Genetics Diagnosis	Assignment 1 due
6	<b>19</b>	Gene Therapy	
7	<b>20</b>	Personalized Medicine and CF	
	<b>22</b>	Groups meet in class	
8	<b>26</b>	Linkage, Pedigrees and DNA pooling	
9	<b>27</b>	Cancer [ <b>Graham Sinclair</b> ]	
10	<b>29</b>	Odds Ratio, Relative Risk, and <i>BRCA1</i> & <i>BRCA2</i>	Start Assignment 2
	October		
11	<b>3</b>	SNPs and the Hazard Ratio	
12	<b>4</b>	Tumor Transcription, Cancer Evolution	
14	<b>6</b>	Over-diagnosis	Assignment 2 due
	<b>10</b>	<b>Midterm</b>	
15	<b>11</b>	HIV-AIDS 1	
16	<b>13</b>	HIV-AIDS 2	
	<b>17</b>	Groups meet in class	
17	<b>18</b>	The HapMap	Start Assignment 3
18	<b>20</b>	Macular Degeneration	
19	<b>24</b>	GWAS (Genome-Wide Association Studies)	
20	<b>25</b>	Transcriptome and Exome sequencing	
21	<b>27</b>	CRISPR cas-9/Genome editing	Assignment 3 due
	<b>Oct. 31</b>	Group presentations begin ( <i>Scary</i> )	

\* Revisions may be made during the semester.