

ORIGINAL COURSE IMPLEMENTATION DATE: REVISED COURSE IMPLEMENTATION DATE: January 2007 September 2020 April 2025

COURSE TO BE REVIEWED (six years after UEC approval): Course outline form version: 05/18/2018

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: BIO 350		Number of Credits: 3 Course credit policy (105)						
Course Full Title: Medical Genetics	·							
Course Short Title:								
(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)								
Faculty: Faculty of Science	[Department (or program if no department): Biology						
Calendar Description:								
Examines the inheritance of diseases in human families and analyzes molecular mechanisms through which genetic changes cause disease. Discusses aspects of genetic counselling and bioethics related to medical genetics.								
Prerequisites (or NONE): BIO 201, BIO 202, and BIC				 D 220.				
Corequisites (if applicable, or NONE):	isites (if applicable, or NONE):							
Pre/corequisites (if applicable, or NONE):								
Antirequisite Courses (Cannot be taken for additional credit.)			Special Topics (Double-click on boxes to select.)					
Former course code/number:			This course is offered with different topics:					
Cross-listed with:			No Yes (If yes, topic will be recorded when offered.)					
Dual-listed with:			Independent Study					
Equivalent course(s):			If offered as an Independent Study course, this course may be repeated for further credit: (<i>If yes, topic will be recorded.</i>)					
(If offered in the previous five years, antirequisite course(s) will be								
included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit)								
			Transfer Credit					
Typical Structure of Instructional Hours			Transfer credit already exists: (See <u>bctransferguide.ca</u> .)					
Lecture/seminar hours	45	🖾 No	⊠ No □ Yes					
Tutorials/workshops			Submit	Submit outline for (re)articulation:				
Supervised laboratory hours			∐ No					
Experiential (field experience, practicum, internship, etc			Grading					
Supervised online activities			🛛 Lette	er Grades 🔲 Credit/No	Credit			
Other contact hours:			Maximu	um enrolment (for infori	mation only): 24			
	Total hours	45	Expect	ed Frequency of Course	e Offerings:			
Labs to be scheduled independent of lecture	hours: 🗌 No	D 🗌 Yes	annually	y (Every semester, Fall o	nly, annually, etc.)			
Department / Program Head or Director: Anthony Stea				Date approved:	February 2019			
Faculty Council approval				Date approved:	March 8, 2019			
Dean/Associate VP: Lucy Lee				Date approved:	March 8, 2019			
Campus-Wide Consultation (CWC)				Date of posting:	n/a			
Undergraduate Education Committee (UEC) approval				Date of meeting:	April 26, 2019			

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- 1. Describe a normal human karyotype.
- 2. Illustrate how abnormalities in chromosome number and structure can cause abnormal phenotypes and/or infertility in humans.
- 3. Determine how point mutations in genes can cause variants and defects in metabolic processes.
- 4. Convey the principles of multifactorial inheritance as they relate to specific and common diseases in humans.
- 5. Identify methods used for screening and diagnosis of genetic disorders and congenital defects both pre- and postnatal.
- 6. Discuss how the sequencing of genomes is affecting medical genetics with respect to personalized and predictive medicine.
- 7. Review data suggesting the role for epigenetics in inherited genetic disease.
- 8. Incorporate basic principles of ethical practice when engaging in the discussion of medical genetics with peers as well as affected individuals and their families.

Prior Learning Assessment and Recognition (PLAR)

Yes I No, PLAR cannot be awarded for this course because

Typical Instructional Methods (Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.)

This course will involve a standard lecture approach to cover basic information and may also include: 1) Guest lectures from medical genetics professionals, and 2) Student group work involving case-studies and/or research articles which will be presented and discussed in class.

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (If more space is required, download Supplemental Texts and Resource Materials form.)

_	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Jorde, Carey, Bamshad	Medical Genetics	\boxtimes	Elsevier	2016
2.					
3.					
4.					
5.					

Required Additional Supplies and Materials (Software, hardware, tools, specialized clothing, etc.)

Library access to PubMed

Typical Evaluation Methods and Weighting

Final exam:	45%	Assignments:	25%	Field experience:	%	Portfolio:	%
Midterm exam:	30%	Project:	%	Practicum:	%	Project:	0%
Quizzes/tests:	%	Lab work:	%	Shop work:	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

- 1. Review of basic concepts of genetics; autosomal vs. sex-linkage, dominance vs. recessive, sex-limited traits and mitochondrial inheritance.
- 2. Clinical cytogenetics; human karyotypes and abnormalities in chromosome structure and number.
- 3. Disorders of metabolism; biochemical basis for defects and variation in metabolic processes and the link with genetic changes.
- 4. Molecular tools for screening, identification of disease causing genes, and diagnosis.
- 5. Genetic causes of cancer and the role of epigenetics.
- 6. Multifactorial inheritance as it relates to congenital malformations, potential disorders that may be studied include; heart disease, stroke, hypertension, diabetes, obesity, alcoholism, and Alzheimer's.
- 7. Genetic testing and gene therapy.
- 8. Genetics and precision medicine.
- 9. Genetic counselling and bioethics.
- 10. Guest lectures from medical genetics experts on selected topics. Topics may include genetic counselling, cancer genetics, cardiac genetics, and genetics in public policy.