This syllabus is a general representation of the course as previously offered and is subject to change.

BIOL 233 – Genetics for Life

General Course Syllabus (as of August 2019)

About the Course:

Course Description: This course provides a solid understanding of modern genetics, and prepares students for advanced genetics courses and biomedical career programs. It covers how genetic differences determine individual characteristics, and how they are inherited, analyzed, and modified. Emphasis is on genetic diversity, human ancestry, personal genomics, and cancer genetics.

Course Format: Lecture videos and face-to-face Tutorials
Credits: 3
Prerequisites: Either:

(a) BIOL 112 and BIOL 121 or
(b) SCIE 001 or
(c) a corequisite of CHEM 203 and one of BIOL 112 or BIOL 121.

Course Learning Objectives:

By the end of this course, students should be able to:

- Understand the genetics principles and issues that affect their lives, and prepare for advanced courses and careers that use genetics.
- Explain how genetic differences determine individual characteristics, and how they are inherited, analyzed, and modified.
- Describe genetic diversity, human ancestry, personal genomics, and cancer genetics.

Textbooks and Additional Resources:

Textbook: There is no required textbook; most students find that the lecture videos take the place of a textbook.

- Recommended supplementary reading: ‘She Has Her Mother’s Laugh, by Carl Zimmer.
- For students who wish to purchase a textbook, used copies of Introduction to Genetic Analysis 11th Ed by Griffiths et al. are widely available. Less-recent editions of this or another genetics textbook are also suitable.

UBC Canvas: Students will find all course resources either on the course Canvas site or linked from it.

Lecture videos: Lecture videos, transcripts, and Powerpoint slides will be provided in the Useful Genetics courses on edX Edge. Links to these courses will be provided. The

videos are also available on the Useful Genetics YouTube Channel. Watching all the videos will require 2-3 hr/week.

Evaluation:

Assessment	Weight	Notes
Tutorials	**15%**	1.5% each for the best 10 of 11 module tutorials
Peer-explain exercises	**10%**	4 peer-explains, done in ComPAIR
Graded quizzes	**10%**	1% each for the best 10 of 11
Midterm	**20%**	
Final	**45%**	Students must past the sum of the midterm and final

DETAILS ON ASSESSMENTS:

Tutorials: The weekly tutorials are compulsory, with weekly marks for in-tutorial learning tasks. Tutorials start in the first week of classes.

Peer-explain assignments: The course includes four 'Peer-explain' assignments, where students write a short explanation of a genetics issue, suitable for a general audience, and then evaluate each other's submissions. The submissions and evaluations will be done using the ComPAIR system, available through Canvas.

Quizzes and Practice problems: Students are recommended to do each module's Practice Problems (on edX Edge) before attempting the graded quiz (on Canvas). Students may also use the Useful Genetics' More Practice Problems' quizzes and other tests as additional practice problems.

Midterm and final exam: All quizzes and exams are open book; students may bring any notes, books and other non-electronic resources. The midterm will cover Modules 1-6. Students who miss the midterm for any reason will have the missing marks provided from their final exam score. The final exam will cover all course material (including tutorial material), and will be held in the regular UBC exam period (students should not make holiday travel plans until the date has been finalized).

Schedule of Topics:

Week	Lecture Topics	Tutorial Topics
1	Introduction	Introductory material
2	Module 1: How different are we?	1: Human genetic history

3	Module 2: How DNA molecules change	2: How mutations arise and accumulate in DNA sequences
4	Module 3: DNA differences and gene functions	3: How DNA sequence changes affect gene functions
5	Module 4: Mutations in regulatory genes	4: Genetic interactions in sex determination and cancer
6	Module 5: Natural genetic variation	5: Genome-wide association study of genes affecting cancer risk
7	Module 6: Personal genomics	6: Exploring personal genomics analysis with 23andMe
8	Module 7: The mechanics of inheritance	7: Using VNTR alleles to analyze family relationships
	Midterm on Modules 1-6	
9	Module 8: Genetic analysis	8: Investigating MDM2 and P53 functions by classical genetic analysis
10	No new module (catchup week)	About the midterm
11	Module 9: All about breeding and inbreeding	9: Designing matings to preserve genetic diversity in a giraffe breeding program
12	Module 10: Chromosomal changes	10: Evolution and function of the opsin gene family
13	Module 11: Advanced topics of particular relevance	11: Genetically modified foods
	Final Exam: scheduled during the standard UBC Exam Period	

A breakdown of specific topics per module are provided on: http://zoo-useful-genetics.sites.olt.ubc.ca/files/2019/02/Module-lecture-topics-list.pdf

Peer-explains:
Topic A: Cancer risk (weeks 5 and 6)
Topic B: DNA testing (weeks 7 and 8)
Topic C: Labradoodles (weeks 10 and 11)
Topic D: Cousin marriage (weeks 12 and 13)

Course Policies:

- Students who must miss a single tutorial can attend another one in the same week, and must let both TAs know so their mark can be properly credited.

University Policies:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence.

UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.

UBC provides appropriate accommodation for students with disabilities and for religious, spiritual and cultural observances.

UBC values academic honesty and students ae expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on the UBC Senate website.