

NB. If one of the in-class tests is missed, the student must write a makeup midterm exam at a later date, after submitting an MSAF.

Tutorial Sessions:

The class will be divided into two groups for tutorial sessions. The tutorials will consist in the short presentation (15-20 min) of a research article on current topics of interest by the students. These articles will be selected by the course coordinator. A summary of the article, worth 6% of the final grade, must also be provided by the student presenting the article. A schedule of these presentations will be established early in the semester. Participation to the tutorials will be evaluated through completion of forms by students attending the tutorials. Guidelines, including the marking scheme, for the presentation and summary of the article will be discussed in class/tutorials and posted on Avenue to Learn.

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

If you are absent from the university for a minor medical/personal reason, lasting fewer than 3 days, you may report your absence, once per term, without documentation, using the McMaster Student Absence Form. Absences for a longer duration or for other reasons must be reported to your Faculty/Program office, with documentation, and relief from term work may not necessarily be granted.

Please note that the MSAF may not be used for term work worth 25% or more, nor can it be used for the final examination.

Immediately after using the online tool, students MUST contact the course coordinator (abedard@mcmaster.ca) regarding the nature of the relief. Failure to do so may negate the opportunity for relief.

CHANGES TO THE COURSE OUTLINE:

At certain points in the course it may make good sense to modify the schedule outlined. The instructor reserves the right to modify elements of the course and will notify students accordingly, both in class and on Avenue to Learn). Posted changes take precedence over this course outline.

The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

ACADEMIC DISHONESTY:

You are expected to exhibit honesty and use ethical behavior in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to knowingly act or fail to act in a way that result or could result in unearned academic credit or advantage. This behavior can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at

<http://www.mcmaster.ca/academicintegrity>

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.

2. Improper collaboration in group work. While we encourage you to work with your peers in solving problems on your assignments, copying of answers is not acceptable. Your final work must be your own.

3. Copying or using unauthorized aids in tests and examinations.

Grades obtained in 3I13 will be converted according to the following scheme, which is the one in general use at McMaster University.

90 – 100%	A+	12
85 – 89%	A	11
80 – 84%	A-	10
77 – 79%	B+	9
73 – 76%	B	8
70 – 72%	B-	7
67 – 69%	C+	6
63 – 66%	C	5
60 – 62%	C-	4
57 – 59%	D+	3
53 – 56%	D	2
50 – 52%	D-	1
0 – 49%	F	0

When the final marks are obtained, ALL borderline cases will be reviewed and, where warranted, adjustments will be made in the final mark.

List of Topics for 2019

- 1- Introduction: Characterization of the Eukaryotic Genome – A Work in Progress
 - Insight provided by genome and transcriptome sequencing projects
 - How much of the genome is transcribed?
 - The “*Dark Genome*”
 - What is a gene?
 - Why study the “non-protein-coding” regions of the genome?
Answers from “*Genome-Wide Association Studies*” (GWAS)
- 2- Control of Gene Expression: Review of Basic Principles
 - Transcription Initiation – Recruitment of the Basic Transcription Machinery
 - Coupling in transcriptional and post-transcriptional processes
- 3- Histone Code
 - Readers, Writers and Erasers
 - Principles in Chromatin Modification
- 4- Active vs Repressed Chromatin States: Overview
 - Euchromatin vs Heterochromatin
 - DNA methylation and DNA methylases recruitment
 - DNA methylation in monozygotic twins.
- 5- Control of Gene Expression at the Chromatin level
 - Chromatin Modification and Chromatin Remodeling Complexes
 - “Noise” vs Spurious Transcription in the absence of Repression
 - Trx and PcG Complexes
 - HP1 and Chromatin Silencing
- 6- Role of Noncoding RNAs in chromatin modification and gene expression
 - LncRNAs in scaffolding/recruitment of Chromatin Complexes
 - DNA methylation is coupled to the recruitment of chromatin modification complexes
 - Control of gene expression by miRNA and other small non-coding RNAs (sncRNAs)
- 7- Pioneering Transcription Factors in Gene Activation
 - Pioneering Transcription Factors; Definition
 - Cell Reprogramming by Pioneering Transcription Factors
 - Inducible Pluripotent Stem Cells - iPSC
- 8- Epigenetic Processes in the Maintenance of Genome Integrity
 - Maintenance of the Chromatin State during Cell Replication
 - Maintenance of Genome Integrity: piRNAs & Transposon Silencing
- 9- Epigenetic Mechanisms of Transgenerational Inheritance
 - Starvation Response in Worms: siRNAs
 - Stress Response in Fly: Role of PcG Complexes
 - Stress Response in Plants

10- Transgenerational Inheritance in humans?

- Epigenetic Reprogramming during Gametogenesis
- Stress Response and Stress Markers
- *"Lifestyle in the sperm"*: Role of small RNAs

11- Personalized/Precision Medicine and Current Questions in Bioethics

- Definition and Goals of Precision Medicine
- Cancer Epigenetics, the *"Cancer Genome Project"*, the *"Canadian Epigenetics, Environment and Health Research Consortium"* (CEEHRC)
- Bioethical Questions: - *"Don't Blame the Mothers"* (Longitudinal Studies on stress response genes)

12- Genome Editing

- CRISPR and other approaches
- Case study and ethical issues