



Department of Biology

COURSE SYLLABUS

Course title:	BIOL 226 - From Genes to Genomics		
Course code:	CRN 60466	Term:	Interession 2018 (Q4)
Course credits:	3.0	Delivery:	Lecture & Lab
Class session:	01	Start Date:	July 24 2018
Lecture room:	BIOL 125	Lab room:	Thordvalson G77
Lecture time:	MTWRF 8:30 to 10:50 am	Lab time:	MTWRF 1:30 to 4.20pm
Website/notes:	via Blackboard	Prerequisites	Biology 120.3 or 110.6

Course Description

This course combines classical Mendelian genetics with contemporary molecular analysis. The first half of the course focuses on Mendelian genetics (including modified Mendelian inheritance) as we relate it to the chromosomal theory of inheritance. This is followed by the study of genetic linkage, genetic recombination, and genetic mapping. In the second half, we turn to understand the fundamental molecular processes (transcription and translation) that control the flow of genetic information (the Central Dogma of Molecular Biology) and how our understanding of genetics and its uses have changed with the advent of recombinant DNA technology. We finish by investigating how the genome is transcriptionally regulated (genetically and epigenetically) to yield genetic variation at the level of the phenotype. This course is an introduction of the basic genetics concepts that permeate several other fields in the biological sciences from biochemistry to cell biology.

Learning Outcomes

By the completion of this course, students will be expected to:

1. Understand the basics of genetic analysis at the gene and genome levels.
2. Understand the functional organization of prokaryotic and eukaryotic genomes.
3. Understand gene expression and regulation mechanisms.
4. Be able to solve genetic problems.

Note: The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors and the institution. A copy of the Learning Charter can be found at:

http://www.usask.ca/university_secretary/LearningCharter.pdf

Lecture Schedule (July 25 to Aug 15)

<i>Date</i>	Lecture #	Topic
<i>July 24 - Tuesday</i>	1	TOPIC 1 - Chapters 2/3 - The fundamental principles of heredity
<i>July 25 - Wednesday</i>	2	TOPIC 2 - Chapters 2/16/17 - Chromosomal basis of Mendelism
<i>July 26 - Thursday</i>	3	TOPIC 3 - Chapter 6 - Extensions of Mendelian laws
<i>July 27 - Friday</i>	4	TOPIC 4 - Chapter 4 - Linkage and genetic mapping
<i>July 30 - Monday</i>	5	TOPIC 4 - Chapter 4 - Linkage and genetic mapping
<i>July 31 - Tuesday</i>		MIDTERM EXAM - 9:00 am BIOL125
<i>August 01 - Wednesday</i>	6	TOPIC 5 - Chapters 8/9 - Transcription and translation
<i>August 02 - Thursday</i>	7	TOPIC 5 - Chapters 8/9 - Transcription and translation
<i>August 03 - Friday</i>	8	TOPIC 6 - Chapter 10 - Gene isolation and manipulation
August 06 - Monday		Saskatchewan Day (University closed)
<i>August 07 - Tuesday</i>	9	"Playing God" (documentary)
<i>August 08 - Wednesday</i>	10	TOPIC 7 - Chapter 11 - Regulation of gene expression in prokaryotes
<i>August 09 - Thursday</i>	11	TOPIC 7 - Chapter 11 - Regulation of gene expression in prokaryotes
<i>August 10 - Friday</i>	12	TOPIC 8 - Chapter 12 - Regulation of gene expression in eukaryotes
<i>August 13 - Monday</i>	13	TOPIC 9 - Chapter 12 - Epigenetic control of gene expression
<i>August 14 - Tuesday</i>	14	"The ghost in our genes" (documentary)
<i>August 15/17 TBA</i>		FINAL EXAM - TBA

Please be aware that there won't be make up lectures. Please plan to attend all lectures.

Course Overview

The course consists of 2 hrs and 20 minutes of lecture time per day, five times a week. Laboratories will be held in the afternoons and will be divided in introduction, protocol explanation and experiment parts. At the end of each experiment, a discussion will take place considering the data generated in the class. A laboratory exam will be administered. More details will be made available in the first laboratory section.

Instructor information:

Instructor: Carlos Carvalho

Contact info:

Office: room 142 BIOL Building

Ph# 966-4436

Email: carlos.carvalho@usask.ca

Lab Coordinator: TBA

Contact info:

Office: room G77 THORV Building

Ph# 966-4431

Email:

Office Hours: Please note that all instructors have other commitments that may take them away from their office. Specific appointments can be set by email only.

Instructor Profiles & Other Information: Dr. Carvalho is a regular faculty member in the Department of Biology. He holds an MSc in Molecular Biology and a PhD in Molecular Genetics.

Laboratory Section

Details on lab schedule and experiments will be provided in the first laboratory session.

Each student is required to purchase an access code from the U of S campus book store for downloading the lab book- <https://artsandscience.usask.ca/ebook>. Access code can be purchased for 25 \$.

Resources

Suggested Text:

Introduction to Genetic Analysis – 11th edition. Griffiths et. al. 2015.

Support text:

Principles of Genetics – 6th Edition. Snustad and Simmons. 2012.

Most lectures will be based on chapters of the **Griffiths** text listed above. In some cases, sections of chapters will be complemented with information from the **Snustad** text. Chapter links to the lectures will be announced in class. Copies of the textbook can be found in the Natural Sciences Library. The textbook should help students to prepare in advance for lecture and as a resource in studying for exams, it should not be used as a substitute for the lecture notes and attendance.

Electronic Resources

Lecture notes will be posted on Blackboard (Paws). **It is required that students acquire a license to use Sapling®** (saplinglearning.com) with their textbook or online separately. You are not required to purchase the textbook, but you must acquire a Sapling® license to take the assignments. Two assignments using the Sapling platform will account for 10% of the student's marks. More information in sapling® will be given in lecture in the beginning of the course.

Grading Scheme

Evaluation of Student Performance

There are four components in the marking scheme of the course: Midterm exam, Final exam, Question Assignments (Sapling®) and the final lab exam. There are no minimal marks required in these individual components in order to successfully pass the course.

Midterm and Final exam questions will be based on the material (posted notes) presented and discussed in lecture. Use the suggested textbooks and online material as reference for context when studying.

1) Midterm Exam Value: 25% of final course grade. **Date:** July 31st from 8:30 to 10:00 at room 125 (Biology).
Format: 40 multiple choice questions. Calculators allowed. No phones, laptops, tablets or other material

allowed. The midterm exam covers the first five lectures of the course.

2) Final Exam Value: 35% of final grade. Date: Consult the Final Exam Schedule. **Length:** 3 hours **Format:** 70 multiple choice questions. The final exam covers the material delivered in the lectures after the Midterm exam. No phones, laptops, tablets or other material allowed.

3) Question Assignments: 10% of final grade. Two out-of-class online questions assignments, one for material covered prior to the Midterm and the one for material cover past the midterm. Each assignment consists of 20 questions that will be posted online through sapling. Students will have 3 days to complete each assignment. Full completion of the exercises will grant full marks for the assignment, irrespective of the score (correct answers). Each assignment represents 5% of the total course marks. More details about how to use sapling will be given in the first lecture.

Lab Component: 30% Final of final course grade. **Lab Exam:** accounts for **25%** and **weekly lab assignments for 5%**. For due dates, see Lab schedule above. The final lab exam consists of 50 multiple choice questions. For more information, please attend the first laboratory section of the course.

Required Components and Exam Scheduling

Student MUST complete all laboratory exercises and take the lab exam to pass the course. There is no minimum lab mark requirement. In case the laboratory requirement is not met, the final course mark will be a fail irrespective of performance in midterm and final exams. Students are expected to attend all scheduled laboratory practices. No make up labs will be offered. **The lab exam, midterm and final examinations must be written on the date scheduled.** Failure to take any exam(s) will result in a mark of 0 (zero) for the correspondent exam(s). Final course examinations may be scheduled at any time during the examination period; students should therefore avoid making prior travel, employment, or other commitments for this period. If a student is unable to write a midterm or the lab exam through no fault of his or her own, for medical or other valid reasons, documentation must be provided and an opportunity to write the missed exam may be given. **Students who miss the final exam must contact the College and apply for a deferred final exam.** Deferred exams are scheduled by the undergraduate office and may utilize a different format than the regular exam, at the sole discretion of the instructor. Students are encouraged to review all University examination policies and procedures:

<http://www.usask.ca/calendar/exams&grades/examregs/>

University of Saskatchewan Grading System

Students in BIOL 226 are reminded that the University has established a grading system to be used in all of its courses. Information on literal descriptors for grading at the University of Saskatchewan can be found at: <http://students.usask.ca/current/academics/grades/grading-system.php>

Integrity Defined (from the Office of the University Secretary)

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation

in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University. All students should read and be familiar with the Regulations on Academic Student Misconduct (http://www.usask.ca/university_secretary/honesty/StudentAcademicMisconduct.pdf) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (http://www.usask.ca/university_secretary/honesty/StudentNonAcademicMisconduct2012.pdf)

For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at:

http://www.usask.ca/university_secretary/pdf/dishonesty_info_sheet.pdf

Examinations through Disability Services for Students (DSS)

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Disability Services for Students (DSS) if they have not already done so. Students who suspect they may have disabilities should contact DSS for advice and referrals. It is the responsibility of the student to contact DSS in advance of exams. In order to access DSS programs and supports, students must follow DSS policy and procedures. For more information, check <http://students.usask.ca/current/disability/> or contact DSS at 966-7273 or dss@usask.ca.