



UNIVERSITY OF
SASKATCHEWAN

Department of Biology

COURSE SYLLABUS

COURSE TITLE:	BIOL 226 - 01 From Genes to Genomes	TERM:	Interession 2015
COURSE CODE:	CRN 60899	DELIVERY:	Lecture & Practicum (Lab)
COURSE CREDITS:	3.0	START DATE:	July 21 2015
CLASS SECTION:	01	LAB LOCATION:	Thorvaldson G77
LECTURE LOCATION:	Rm 263 Arts	LAB TIME:	MTWRF 1:30 to 4.30pm
LECTURE TIME:	MTWRF 8:30 to 10:50 am	WEBSITE:	via Blackboard
PREREQUISITES	Biology 120.3 or 110.6		

Course Description

This course combines classical Mendelian genetics with contemporary genomic analysis. First, we focus 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. We then turn to understand the fundamental molecular processes (transcription and translation) that control the flow of genetic information and how our understanding of genetics and its uses have changed with the advent of molecular biology and recombinant DNA technology. We finish by investigating how the genome is (genetically and epigenetically) regulated at the level of gene expression to yield genetic variation at the level of the phenotype.

Learning Outcomes

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

1. Understand the basic of genetic analysis at the gene, genome and population levels.
2. Understand the basic 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

<i>Date</i>	Lecture #	Topic
<i>July 21 - Tuesday</i>	1	TOPIC 1 - Chapter 3 - Mendelism: The Basic Principles of Inheritance
<i>July 22 - Wednesday</i>	2	TOPIC 2 - Chapter 4 - Extensions of Mendelism
<i>July 23 - Thursday</i>	3	TOPIC 3 - Chapter 5 - Chromosomal Basis of Mendelism
<i>July 24 - Friday</i>	4	TOPIC 4 - Chapter 6 - Chromosome Number and Structure
<i>July 27 - Monday</i>	5	TOPIC 5 - Chapter 7 - Linkage and Crossing Over
<i>July 28 - Tuesday</i>		MIDTERM EXAM - 9:00 am Arts 263
<i>July 29 - Wednesday</i>	6	TOPIC 6 - Chapter 11 - The Central Dogma of Molecular Biology
<i>July 30 - Thursday</i>	7	TOPIC 7 - Chapter 12 - Translation and the Genetic Code
<i>July 31 - Friday</i>	8	"Playing God" (documentary)
<i>August 3 - Monday</i>		Saskatchewan Day (University closed)
<i>August 4 - Tuesday</i>	9	TOPIC 8 - Chapter 14 - Recombinant DNA technology
<i>August 5 - Wednesday</i>	10	TOPIC 9 - Chapter 16 - Applications of Molecular Genetics
<i>August 6 - Thursday</i>	11	TOPIC 10 - Chapter 18 - Genetic Control of Gene Expression (Prokaryotes)
<i>August 7 - Friday</i>	12	TOPIC 11 - Chapter 19 - Genetic Control of Gene Expression (Eukaryotes)
<i>August 10 - Monday</i>	13	TOPIC 12 - Chapter 19 - Epigenetics Control of Gene Expression
<i>August 11 - Tuesday</i>	14	"The ghosts in Our Genes" (documentary)
<i>August 13 - Thursday</i>		FINAL EXAM - 9:00am room TBA

Course Overview

The course consists of 2hrs and 20 minutes of lecture time per day, every day for a total of 14 lectures. 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. The laboratory exercises will be composed of simple questions about the experiment performed and will be taken individually at a scheduled lab time after the respective laboratory exercise and discussion are completed.

Laboratory Section

Date	Lab	Lab Exercise	Assignment
July 21st	1	Introduction to Drosophila Genetics	
July 22nd	2	Cross 1 - Analysis of P ₁ , P ₂ , F ₁ phenotypes.	Concept Problem Problem solving
July 23th	3	Cross 2 - Analysis of P ₁ , P ₂ , F ₁ phenotypes. Count F ₂ progeny from Cross 1	Concept Problem Problem solving

July 24th	4	Count F ₂ progeny from Cross 1, Cross 2	Concept Problem Problem solving
July 27th	5	Cross 3: - Analysis of P ₁ , P ₂ , F ₁ phenotypes. Count F ₂ progeny from Crosses 2 and 3.	Concept Problem Problem solving
July 28th	6	Thin Layer Chromatography of Eye Pigments Count F ₂ progeny from Crosses 2 and 3. Hand in results from cross 1	Concept Problem Problem solving
July 29th	7	Thin Layer Chromatography of Eye Pigments Count F ₂ progeny from Crosses 2 and 3.	Concept Problem Problem solving
July 31st	8	Count F₂ progeny from Crosses 2 and 3.	
Aug 3rd		Saskatchewan Day (University Closed)	
Aug 4th	9	Review of class results	Concept Problem Problem solving
Aug 5th	10	Final Lab Exam	
Aug 6th	11	No Lab	
Aug 7th	12	Return of Lab Exam for review	Concept Problems Problem solving
Aug 10th	13	No Lab	
Aug 11th	14	No Lab	

Instructor:

Contact Information:

Instructor: Carlos Carvalho (instructor)

Contact info:

Office: room 142 BIOL Building

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Lab Coordinator: Vasu Penugonde (lab coordinator)

Contact info:

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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.

Suggested Resources

Textbooks

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

Most lectures will be based on chapters of the textbook listed above. In some cases, only sections of chapters will be covered. Chapter link to the lectures will be announced in class. Copies of the textbook can be found in the Natural Sciences Library.

Electronic Resources

Lecture notes, laboratory material, etc, will be posted on Blackboard (Paws).

Grading Scheme

Evaluation of Student Performance

There are three components in the marking scheme of the course: Midterm exam, Final exam and the final lab exam. There are no minimal marks required in these individual components in order to successfully pass the course.

Midterm Exam Value: 30% of final course grade **Date:** July 29th from 8:30 to 10:00 at room 125 (Biology).

Format: Multiple choice questions. Calculators allowed. No phones, laptops, tablets or other material allowed.

Final Exam Value: 40 % of final grade **Date:** Consult the Final Exam Schedule **Length:** 3 hours **Format:** Multiple choice questions. **Description:** The exam is comprehensive in that it will cover all lecture, material. Material delivered since the midterm exam will be emphasized. Calculators allowed. No phones, laptops, tablets or other material allowed.

Final Lab Exam: is worth 30% of final grade **Due Date:** See Course Schedule **Format:** Multiple choice and short answer questions about the experiments and background of the laboratory experiments.

Attendance Expectations

1. Midterm Exam; 2. Final Exam; 3. Completion of all laboratory exercises. Students are expected to attend all scheduled lab. No make labs will be offered.

Midterm and Final Examination Scheduling

Midterm and final examinations must be written on the date scheduled. 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 may utilize a different format than the regular exam, at the sole discretion of the instructors. 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.