UNIVERSITY OF SASKATCHEWAN

Department of Biology

COURSE SYLLABUS

Course title:	**BIOL 226 - From Genes to Genomics**		
Course code:	CRN 60466	Term:	Intersession 2017 (Q4)
Course credicts:	3.0	Delivery:	Lecture & Lab
Class session:	01	Start Date:	July 21 2015
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 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 (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 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

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Lecture Schedule (July 25 to Aug 15)

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

Date	Lecture #	Topic
July 25 - Tuesday	1	TOPIC 1 - Chapters 2/3 - The fundamental principles of heredity
July 26 - Wednesday	2	TOPIC 2 - Chapters 2/16/17 – Chromosomal basis of Mendelism
July 27 - Thursday	3	TOPIC 3 - Chapter 6 – Extensions of Mendelian laws
July 28 - Friday	4	TOPIC 4 - Chapter 4 – Linkage and genetic mapping
July 31 - Monday	5	TOPIC 4 - Chapter 4 – Linkage and genetic mapping
August 01 - Tuesday		**MIDTERM EXAM – 9:00 am BIOL125**
August 02 - Wednesday	6	TOPIC 5 - Chapters 8/9 – Transcription and translation
August 03 - Thursday	7	TOPIC 5 - Chapters 8/9 – Transcription and translation
August 04 - Friday	8	TOPIC 6 - Chapter 10 – Recombinant DNA
August 07 – Monday		Saskatchewan Day (University closed)
August 08 – Tuesday	9	"Playing God" (documentary)
August 09 – Wednesday	10	TOPIC 7 - Chapter 11 – Gene expression in prokaryotes - **FINAL LAB EXAM**
August 10 – Thursday	11	TOPIC 7- Chapter 11 – Gene expression in prokaryotes
August 11 – Friday	12	TOPIC 8 - Chapter 12 – Gene expression in eukaryotes
August 14 – Monday	13	TOPIC 9 – Chapter 12 – Epigenetic control of gene expression
August 15 - Tuesday	14	"The ghosts in Our Genes" (documentary)
August 16/18 TBA		**FINAL EXAM - 9:00am room TBA**

Course Overview

The course consists of 2hr 20min lectures every days for three weeks. 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 exam will be administered. More details will be made available in the first laboratory section.

Instructor information:

Instructor: Carlos Carvalho
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Lab Coordinator: Vasu Penugonde
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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.