



Department of Biology

### COURSE SYLLABUS

<b>Course</b>	COURSE TITLE:	BIOL 302 Evolutionary processes	TERM:	T1 Fall 2013
	COURSE CODE:	CRN 85703	DELIVERY:	Lecture & Practicum (Lab)
	COURSE CREDITS:	3.0	START DATE:	06 Sept 2013
	CLASS SECTION:	01	LAB LOCATION:	212 Biology
	LECTURE LOCATION:	rm 106 Biology Bldg	LAB TIME:	TH-F 1.30pm,
	LECTURE TIME:	8:30 to 9:20 am		
	WEBSITE:	via Blackboard		

### Description and learning outcomes

Evolution is the unifying principle of all biology, and understanding how evolutionary relationships are represented is critical for a complete understanding of evolution. The first part of the course is aim to train you in “tree thinking” (i.e. the ability to conceptualize evolutionary relationships). To do so we will learn how to read modern evolutionary (phylogenetic) trees in the same way as beginning students of geography learn how to read maps.

The second part of the course introduces micro-evolutionary processes. Many of the key concepts in (micro)evolution are based on mathematical models. I firmly believe that models are only worth teaching, and learning. You will learn where these models come from and understand their underlying biological assumptions. I do not encourage you to memorize “a bunch of equations”. Instead, I hearten the understanding of basic models by (i) describing the foundations of the models in a step-wise manner, (ii) using alternative graphical/intuitive approaches and (iii) demonstrating models/principles with the appropriate problems and exercises.

The third part of the course brings together both macro and micro-evolutionary processes. In this part of the course you will develop the skills and knowledge to answer critical questions about our own world. Why do we have sex? How new species arise? Why do we cooperate? The answers to many of these questions rely in the construction/demonstration of complicated mathematical models that are beyond the scope of this course. Therefore, we will initially present the concepts/models in a familiar verbal mode. Then, we will present them in a more abstract mode using graphs and instructive imagery.

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](http://www.usask.ca/university_secretary/LearningCharter.pdf)

## Course Overview

The course consists of 50 minutes of lecture per day for a total of 34 lectures. Laboratories will involve simple simulations of principles and concepts. 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 Exercises

Several population genetics simulations. One phylogenetics lab.

### SEPTEMBER

	Lectures	Labs
Sept 06 – F	Introduction	
Sept 09 – M	Lec01	
Sept 11 – W	Lec02	NO LABS
Sept 13 – F	Lec03	
Sept 16 – M	Lec04	NO LABS
Sept 18 – W	Lec05	
Sept 20 – F	Lec06	
Sept 23 – M	Lec07	La Population genetics !
Sept 25 – W	Lec08	
Sept 27 – F	Lec09	
Sept 30 – M	Lec10	Lab Population genetics II: HW equilibrium

### OCTOBER

Oct 02 – W	Lec11	
Oct 04 – F	Lec12	
Oct 07 – M	Lec13	Lab Population genetics III: Selection
Oct 09 – W	Lec14	
Oct 11 – Thanksgiving		
Oct 14 – Thanksgiving		
Oct 16 – W	MIDTERM	Lab Population genetics IV: Selection
Oct 18 – F	Lec15	
Oct 21 – M	Lec16	Lab Population genetics IV: Selection
Oct 23 – W	Lec17	
Oct 25 – F	Lec18	
Oct 28 – M	Lec19	Lab Population genetics V: polygenic traits
Oct 30 – W	Lec20	

### NOVEMBER

Nov 01 – F	Lec21	
Nov 04 – M	Lec22	Lab Population genetics VI: Drift
Nov 06 – W	Lec23	
Nov 08 – F	Lec24	
Nov 11 – Remembrance Day		
Nov 13 – W	Lec25	Lab phylogenies
Nov 15 – F	Lec26	
Nov 18 – M	Lec27	Review lab
Nov 20 – W	Lec28	
Nov 22 – F	Lec29	
Nov 25 – M	Lec30	
Nov 27 – W	Lec31	
Nov 29 – F	Lec32	

**Nov 30- Sat**  
DECEMBER

**Lab exam**

Dec 02 – M                      Lec33  
Dec 04 – W                      Lec34

FINAL EXAM : TBA

### **Instructors:**

#### **Contact Information:**

**Instructor:** Jose Andres

#### **Contact info:**

Office: room 129 BIOL Building

Ph# 966-2699

Email: [jose.andres@usask.ca](mailto:jose.andres@usask.ca)

**Lab Coordinator:** Scott Halpin

#### **Contact info:**

Office: 150 Biology Building

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Email: [Scott.halpin@usask.ca](mailto:Scott.halpin@usask.ca)

**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. Andres is a regular faculty member in the Department of Biology. He holds a PhD in evolutionary biology and he is a good marathon runner for his age (PR: 2 h 50 min).

### **Suggested Resources**

#### **Textbooks**

**Evolution** 3<sup>th</sup> Edition, Douglas J. Futuyma. 2013. **Introduction to Population Genetics**. Halliburton 2004.

Most lectures will be based on chapters of the textbook listed above. Chapter link to the lectures will be announced in class. Copies of the textbooks 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**

**Midterm Exam Value:** 20% of final course grade **Date:** October 16<sup>th</sup> from 10:30 to 11:20 at room 106. **Format:** Multiple choice problems and 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 problems and 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.

**Individual Laboratory writing assignments: Value:** together 25% of final grade **Due Date:** See Course Schedule Late assignments will be penalized (- 5% per working day). **Format:** Multiple choice short and long answer questions about the experiments and background of the laboratory experiments

**Lab exam: Value:** 15% **Date:** Nov 30<sup>th</sup>. 9.30 am. **Format:** Multiple choice, problems and short answer questions about the experiments and background of the laboratory experiments.

### Attendance Expectations

There are no mandatory components to this course. 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 302 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](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](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](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. 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](mailto:dss@usask.ca).