

## COURSE SYLLABUS

<b>COURSE TITLE:</b>	<i>PLANT SYSTEMATICS AND EVOLUTION</i>	
<b>COURSE CODE:</b>	85332	<b>TERM: 01</b>
<b>COURSE CREDITS:</b>	3	<b>DELIVERY:</b>
<b>CLASS SECTION:</b>		<b>START DATE:</b> Sept 3, 2014
<b>CLASS LOCATION:</b>	Ag. 4C77	<b>LAB LOCATION:</b> Ag. 4C77
<b>CLASS TIME:</b> MWF 9:30-10:20 am		<b>LAB TIME: W</b> <b>1:30-5:20 pm</b>
<b>WEBSITE:</b>		

### Course Description

The emphasis of this course is to learn the basic principles of plant taxonomy and the identification of the main plant families. The course also focuses on current concepts of plant evolution and phylogenetic relationships among vascular plants.

### Prerequisites

Biol. 222 or instructor's approval

### Learning Outcomes

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

- To understand the basic concepts of nomenclature and classification.
- To understand the structure, function and relationship between flowers, fruits, and seeds as well as floral evolution and pollination syndromes across different plant lineages.
- To provide the students with the general knowledge about plant structure and the necessary terminology to identify plants using dichotomous keys. Emphasis is on the flora of Saskatchewan.
- To explore plant phylogeny and learn tempos and modes of evolution and origin and diversification of land plants, emphasizing major flowering plant groups.
- To develop an appreciation of the fundamental role of taxonomy, systematic and botanical collections to other disciplines.

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>

Please note: There are different literal descriptors for undergraduate and graduate students.

More information on the Academic Courses Policy on course delivery, examinations and assessment of student learning can be found at: [http://www.usask.ca/university\\_secretary/council/academiccourses.php](http://www.usask.ca/university_secretary/council/academiccourses.php)

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)

## University of Saskatchewan Grading System (for undergraduate courses)

**Exceptional (90-100)** A superior performance with consistent evidence of

- a comprehensive, incisive grasp of the subject matter;
- an ability to make insightful critical evaluation of the material given;
- an exceptional capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

**Excellent (80-90)** An excellent performance with strong evidence of

- a comprehensive grasp of the subject matter;
- an ability to make sound critical evaluation of the material given;
- a very good capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

**Good (70-79)** A good performance with evidence of

- a substantial knowledge of the subject matter;
- a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;
- some capacity for original, creative and/or logical thinking;
- a good ability to organize, to analyze and to examine the subject material in a critical and constructive manner.

**Satisfactory (60-69)** A generally satisfactory and intellectually adequate performance with evidence of

- an acceptable basic grasp of the subject material;
- a fair understanding of the relevant issues;
- a general familiarity with the relevant literature and techniques;
- an ability to develop solutions to moderately difficult problems related to the subject material;
- a moderate ability to examine the material in a critical and analytical manner.

**Minimal Pass (50-59)** A barely acceptable performance with evidence of

- a familiarity with the subject material;
- some evidence that analytical skills have been developed;
- some understanding of relevant issues;
- some familiarity with the relevant literature and techniques;
- attempts to solve moderately difficult problems related to the subject material and to examine the material in a critical and analytical manner which are only partially successful.

**Failure <50** An unacceptable performance

## Course Overview

### Class Schedule

BIOL. 323.3.1	-	PLANT SYSTEMATICS & EVOLUTION	-	FALL 2014
LECTURE SCHEDULE				
INSTRUCTOR: J. HUGO COTA-SÁNCHEZ, PH.D.				

Date	Lecture Topic	Reading Assignment	Lab Topic
Sept. 3	Course overview & Introd. to Plant Systematics	Ch. 1 pp 1-11	
Sept. 5	Botanical History	Ch. 3 pp. 39-52	
Sept. 8	Classification & Nomenclature	Ch. 3 pp. 39-52; 543-52	
Sept. 10	Phytography: Vegetative & Reproductive Parts	Ch. 4 pp. 53-61	Vegetative Struct.
Sept. 12	Flower and Fruit Evolution I	Ch. 4 pp. 61-66	
Sept. 13	<a href="#">Field trip to MacDowall Bog Protected Area</a>	<a href="#">Departing at 9:00 am</a>	<a href="#">Field trip</a>
Sept. 15	Flower and Fruit Evolution II	Ch. 4 pp. 72-81	
Sept. 17	Cladistics & Molecular Systematics	Ch. 2 pp. 13-37; Ch. 5 pp. 103-117	Reproduct. Struct.
Sept. 19	Overview of Vascular Plant Phylogeny I	Ch. 7 pp. 153-180	
Sept. 20	<a href="#">Field trip to Cranberry Flats and Beaver Creek</a>	<a href="#">Departing at: 9:00 am</a>	<a href="#">Field trip</a>
Sept. 22	Ferns & Gymnosperms	Ch. 8 pp. 185-221	
Sept. 24	Vascular Plant Phylogeny II	Ch. 9 pp. 225-231	Ferns & Gymnosp Tour: Geol. Atrium
Sept. 26	ANITA Grade	Ch. 9 pp. 232-235	
Sept. 29	Magnoliid Complex, Non-Monocot Paleoherbs and Basal Tricolpates	Ch. 9 pp. 236-247; 307-317	
Oct. 1	Caryophyllales and allies I	Ch. 9 pp. 318-342	ANITA & Magnoliids
Oct. 3	Caryophyllales and allies II – Saxifragales		
Oct. 6	Cactaceae		
Oct. 8	Rosids I	Ch. 9 pp. 346-440	Caryophyllales
Oct. 10	<b>MIDTERM I (through Sept. 29)</b>		
Oct. 13	<b>NO CLASS</b> – Thanksgiving		
Oct. 15	Rosids II		Rosids
Oct. 17	Asterids I	Ch. 9 pp. 441-508	
Oct. 20	Asterids II		
Oct. 22	Asterids III - Asteraceae	Ch. 9 pp. 508-515	Asterids
Oct. 24	Monocots I	Ch. 9 pp. 249-282	
Oct. 27	Monocots II – Zingiberales & Poales	Ch. 9 pp. 285-304	
Oct. 29	Monocots III – Grasses – Poales (continued)		Monocots
Oct. 31	TOUR: W.P. Fraser Herbarium (SASK) & Systematic Collections: Uses, Purposes, Services	Appendix 2: pp. 553-565 Collection management	
Nov. 3	Catching up & Plant Family Review (Qs & As)		
Nov. 5	Angiosperm origins and diversity I	T.F. Stuessy Paper	Project ID Lab
Nov. 7	<b>MIDTERM II (through Oct. 29)</b>		
Nov. 10-14	<b>NO CLASS</b> – Fall mid-term break		
Nov. 17	Angiosperm origins and diversity II		
Nov. 19	Reproductive Biology & Pollination	Ch. 4 pp. 67-72	Project ID Lab
Nov. 21	Plant Speciation	Ch. 6 pp. 119-132; 144-46	
Nov. 24	Hybridization and Polyploidy I	Ch. 6 pp. 132-144	
Nov. 26	Hybridization and Polyploidy II		Project ID Lab
Nov. 28	Field Trip to Biology Greenhouses & REVIEW		
Dec. 1	World Plant Communities, Biodiversity, Biodiversity Hotspots & Conservation: WPCHC - I	TBA	<b>PLANT COLLECTION PROJECT DUE By 4:00 pm</b>
Dec. 3	WPCHC II		
Dec. 3	<b>LABORATORY FINAL (PRACTICUM)</b>	Ag. 4C77	
Dec. 5	Review Qs & As		

## Midterm and Final Examination Scheduling

Midterm and final examinations must be written on the date scheduled.

Final examinations may be scheduled at any time during the examination period (INSERT FIRST AND LAST DAY OF CURRENT EXAM PERIOD); students should therefore avoid making prior travel, employment, or other commitments for this period. If a student is unable to write an 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 are encouraged to review all examination policies and procedures:  
<http://www.usask.ca/calendar/exams&grades/examregs/>

## Instructor Information

**J. Hugo Cota-Sánchez, Ph.D.**

### Contact Information

Tel. 966-4405; email: [hugo.cota@usask.ca](mailto:hugo.cota@usask.ca)

### Office Hours

MW 10:30 am -12:00 pm, Biol. 141

### Instructor Profile

<http://www.usask.ca/biology/cota-sanchez/lab/>

<http://artsandscience.usask.ca/profile/HCotaSanchez>

## Recommended Resources

### Lecture:

- Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. and M.J. Donohue. 2008. *Plant Systematics: A Phylogenetic Approach*, 3<sup>rd</sup> Ed., Sinauer Assoc., Inc. ISBN: 0-87893-403-0. Call No: QK95.P58 2008.
- Simpson, M.G. 2010. *Plant Systematics*. 2<sup>nd</sup> Ed. Elsevier Acad. Press. Amsterdam. Call No. QK95.S566.
- Harris, J.G. and M.W. Harris. 2001. *Plant Identification Terminology. An Illustrated Glossary*. 2nd Ed. Spring Lake Publishing.
- *Supplementary Lecture Notes and Lab Manual for Biol. 323* will be made available by Dr. Cota-Sanchez. Additional handouts will be posted on PAWS or provided during lectures or before lab sessions whenever necessary.

### Laboratory:

Moss, E.H. 1983. *Flora of Alberta*. 2<sup>nd</sup> Ed. Rev, by Packer, J. G. University of Toronto Press.

Harms, V.H., and A. Leighton. 2011. *Ferns and Allies of Saskatchewan*, fascicle 1. Flora of Saskatchewan Association, Nature Saskatchewan, Regina, SK.

Harms, V.H., and A. Leighton. 2011. *Lilies, Irises and Orchids of Saskatchewan*, fascicle 2. Flora of Saskatchewan Association, Nature Saskatchewan, Regina, SK.

Leighton, A. 2012. *Sedges (Carex) of Saskatchewan*. Flora of Saskatchewan, fascicle 3. Flora of Saskatchewan Association, Nature Saskatchewan, Regina, SK.

Leighton, A., and V.H. Harms. (In prep.). *The Grasses of Saskatchewan*, fascicle 4. Flora of Saskatchewan Association, Nature Saskatchewan, Regina, SK.

## Readings/Textbooks

Textbooks are available from the University of Saskatchewan Bookstore:

[www.usask.ca/consumer\\_services/bookstore/textbooks](http://www.usask.ca/consumer_services/bookstore/textbooks)

## Other Required Materials

## Electronic Resources

## Downloads

## Supplementary Resources

Will be made available on Blackboard

## Grading Scheme

### REQUIRED EXAMINATION, COURSE WORK & GRADING SYSTEM FOR BIOL. 323.3.1

REQUIRED COURSE COMPONENTS	% OF GRADE	DATE(S)
Theory midterm I	10%	October 10, 2014
Theory midterm II	10%	November 7, 2014
Plant collection project	25%	Dec. 1, 2014 by 4 pm.
Laboratory final exam	15%	December 3, 2014
Theory final	30%	December ???, 2014
Quizzes	10%	During lab sessions

## Evaluation Components

See above

**MIDTERM 1 and 2** will be written and scheduled during class time (50 min).

**All exams will be cumulative**, *i.e.*, cover all material studied from the first day of class until the date of the exam. We will, however, emphasize material covered since the last exam. There will also be approximately 5-8 laboratory quizzes (15 minutes each). Note that: class attendance, participation and overall performance in lecture and lab will also be considered in your final grade.

LABORATORY FINAL – Will last four hrs and will be held the last lab of the term. It includes the proper identification of preserved specimens as well as the determination of several plant families based on flower structures. Taxonomic keys and botanical glossaries will be provided.

## Submitting Assignments

**Laboratory project** – A plant collection consisting of 40 properly pressed, and correctly identified and labeled specimens is required. The identification may be conducted during the lab periods time permitting. The collection is to be submitted at the end of the semester.

***The plant collection is worth 25% of your final grade.***

## Late Assignments

**Make-up policy:** You must take examinations during their scheduled periods. Make-up tests will be allowed only if there are extenuating circumstances, in which case the test will be given orally. Laboratory quizzes cannot be made up if missed.

## Criteria That Must Be Met to Pass

### Attendance Expectations

#### ABOUT THE LAB

**Philosophy** – A significant part of the learning experience in this course is in the laboratory portion. This is where we will discuss and debate various ideas, as well as examine fresh materials (flowers!) that will generally not be available to students who miss the lab. It is likely that you will want to spend extra time in the lab to learn the material. Every effort will be made by the instructors to provide individual instruction and help for each student. Our interest is in helping you learn, not in judging you.

**Please note that SOME LABORATORY SESSIONS will be longer than usual and MAY require that you spend extra time (approx. 30 extra min.) to complete your observations.**

**Supplies** - You should bring several useful implements to most lab periods, including 2 dissecting needles, 1 forceps, 1 ruler, and a single-edge razor blade. A 10X hand-lens is highly recommended.

**Field trip** – Two field trips are scheduled during the semester (see below). The objective is to instruct students in more detail in collecting techniques, and to expose them to the diverse plant species and regional plant communities.

#### Field trips dates:

*September 13 - Visit to the Southern boreal forest and MacDowall Bog Protected area.*

*September 20 - Cranberry Flats and Beaver Creek areas.*

**MEETING TIME:** 9:00 am, Biology loading dock, weather permitting!

### Participation

Students are encouraged to participate actively in lecture, laboratory sessions, and fieldtrips.

### Student Feedback

### 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/StudentNon-AcademicMisconduct2012.pdf](http://www.usask.ca/university_secretary/honesty/StudentNon-AcademicMisconduct2012.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 with 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://www.students.usask.ca/disability/>, or contact DSS at 966-7273 or [dss@usask.ca](mailto:dss@usask.ca).

Students registered with DSS may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through DSS by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by DSS.

## **Acknowledgements**

### **Course Contributor(s)**

Mr. Denver Falconer, MSc Candidate – Teaching Assistant and Herbarium Technician