

GENERAL INFORMATION

BIOLOGY 323.3.1 – PLANT SYSTEMATICS AND EVOLUTION – FALL 2014

Instructor: J. Hugo Cota-Sánchez, Ph.D.
Department of Biology

Office: Room 141, Biology Building. *Tel.* 966-4405

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

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Lectures: MWF 9:30 am – 10:20 am, Room 4C77 Agriculture Building

Laboratory: Wednesday 1:30 - 5:20 pm, Room 4C77 Agriculture Building

Teaching Assistant: Mr. Denver Falconer

Course structure:

This is a 3 credit-units course and is taught primarily to Agriculture, Biology, Environmental Science, and Forestry majors. Class meets three times a week, 50 min/meeting. In addition, one 4-hour laboratory period is scheduled weekly.

Course objectives:

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. Overall, the main goals are:

- To introduce the students to 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.

Recommended Textbooks:

Lecture:

- Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. and M.J. Donohue. 2008. *Plant Systematics: A Phylogenetic Approach*, 3rd Ed., Sinauer Assoc., Inc. ISBN: 0-87893-403-0. Call No: QK95.P58 2008.
- Simpson, M.G. 2010. *Plant Systematics*. 2nd. 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*. 2nd. 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.

Other resources:

Soltis, D.E., P.M. Soltis, P.K. Endress, and M.W. Chase. 2005. *Phylogeny and Evolution of Angiosperms*. Sinauer Assoc. Inc. Sunderland, MA. ISBN: 0-87893-817-6

Zomlefer, W. B. 1994. *Guide to Flowering Plant Families*. Chapel Hill, N.C. ISBN: 0807821608.

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 will 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!**

What to bring? Hand lens, notebook, lunch, appropriate clothing, hiking shoes, rubber boots, rain-gear, and water.

Note: field trips may be cancelled due to severe weather and/or road conditions.

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.

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

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.

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.

Students with Special Needs:

Students with special needs and/or disabilities should talk to the instructor about their requirements the first week of classes. Student information will be kept confidential.

Academic Honesty:

Honesty and integrity are expected in class participation, examinations, assignments, and other academic work.

- Perform your own work unless specifically instructed otherwise.
- Use your own work to complete assignments and exams.
- Cite the source when quoting or paraphrasing someone else's work.
- Follow examination rules.
- Be truthful on all university forms.
- Discuss with your professor if you are using the same material for assignments in two different courses.
- Discuss with your professor if you have any questions about whether sources require citation.
- Use the same standard of honesty with fellow students, lab instructors, teaching assistants, sessional instructors and administrative staff as you do with faculty.

Beware of plagiarism!!!! Academic honesty is a must in our institution and plagiarism will be strictly penalized.

For information regarding academic dishonesty at the university visit:

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

For more information regarding Regulations on Student Academic Misconduct visit:

http://www.usask.ca/university_secretary/honesty/StudentAcademicMisconduct.pdf

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	Field trip to MacDowall Bog Protected Area	Departing at 9:00 am	Field trip
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	Field trip to Cranberry Flats and Beaver Creek	Departing at: 9:00 am	Field trip
Sept. 22	Ferns & Gymnosperms	Ch. 8 pp. 185-221	
Sept. 24	Vascular Plant Phylogeny II	Ch. 9 pp. 225-231	Ferns & Gymnosperm 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	MIDTERM I (through Sept. 29)		
Oct. 13	NO CLASS – 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	MIDTERM II (through Oct. 29)		
Nov. 10-14	NO CLASS – 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	PLANT COLLECTION PROJECT DUE By 4:00 pm
Dec. 3	WPCHC II		
Dec. 3	LABORATORY FINAL (PRACTICUM)	Ag. 4C77	
Dec. 5	Review Qs & As		

