UNIVERSITY OF SASKATCHEWAN

COURSE SYLLABUS

COURSE TITLE:	*Plant Systematics and Evolution*		
COURSE CODE:	Biol. 323 – CRN: 81866	**TERM:**	01 - Fall 2022
COURSE CREDITS:	3	**DELIVERY:**	Lecture and laboratory
CLASS SECTION: **CLASS LOCATION:** **CLASS TIME:** **CANVAS WEBSITE:**	1 Geol. 155 M, W, F from 9:30-10:20 am https://canvas.usask.ca/courses/25972	**START DATE:** **LAB LOCATION:** **LAB TIME:**	Sept. 1, 2022 Thorvalson 132 Monday 1:30-5:20 pm

Instructor Information

J. Hugo Cota-Sánchez, Ph.D.
Collaborative Science Research Building (CSRB), Office 320.9
Tel. 966-4405; email: hugo.cota@usask.ca

Office Hours: MW 10:30 am -12:00 pm, or by appointment

Instructor Profile
http://artsandscience.usask.ca/profile/HCotaSanchez
http://www.usask.ca/biology/cota-sanchez/lab/

I love plants, nature and my pets, among other things. My teaching inside and outside of the classroom consists in helping new generations of plant biologists to master a strong body of scientific knowledge while promoting the development of critical thinking, systematic literacy, and writing skills. I believe in the effectiveness of incorporating live teaching material supported by both traditional and dynamic multimedia resources, either face-to-face or in a virtual environment.

My research program involves the study of plant evolution and reproductive biology. As a curator, we investigate the taxonomy, distribution, conservation and rarity status of Saskatchewan's native plants.

Land Acknowledgement

As we gather here today, we acknowledge that the Saskatoon campus of the University of Saskatchewan is on Treaty Six Territory and the Homeland of the Métis. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another. We recognize that in the course of your studies you will spend time learning in other traditional territories and Métis homelands. We wish you safe, productive and respectful encounters in these places.

Learning and Teaching Context

We remind our students that this course is occuring in a time of transition and that this may be the first time some have been learning in person at the university and for others it will have been many months since they have done so. As a result, the past two years have been extremely difficult, with trauma and loss experienced by many in our university community and beyond. Transitioning out of the pandemic period is a change and may be challenging, and that all participants in the course should interact with empathy and care. Please note that important guidelines are included in the next section to help guide everyone through the term safely.

Important guidelines for this term:

During this transition term it is important that we undertake in-person elements of this class safely. In order to do this the university has developed a set of expectations and safety protocols that all students must adhere to if they are to engage in in-person activity.

Throughout the term:

→ **Protect the pack:** Right now, the impact of student choices and activities when not on campus cannot be separated from time spent on campus. In order to "protect the pack", the university is asking all students who are doing in-person work to be mindful and do whatever possible to lower the risk that you will contract COVID-19 and bring it onto campus.

→ **Know what is required and expected of you:** One of the critical lessons learned in dealing with COVID-19 is knowing that situations can change and we must be flexible and ready to adjust our safety protocols. Instead of listing all of the relevant information in your course outline, the university has created a webpage where all up-to-date information around returning to campus is listed. **You are responsible** for **regularly** checking the health and safety guidelines https://covid19.usask.ca/about/safety.php#Expectations and knowing what is expected of you throughout the fall term.

→ **Follow all guidance:** Students are expected to follow all guidance provided by the University's Pandemic Recovery/Response Team (PRT), College/Department, professors, lab instructors, TAs, and any other staff member involved in the in-person academic program activities (e.g., Protective Services, Safety Resources).

→ **Key channels of communication**: If there is a need for the class to pause meeting in-person for a period of time you will be notified. If this occurs, you will be provided with detailed information on what you will need to do in place of the in-person class sessions (e.g., read content posted in Canvas, complete learning activities in Canvas).
Specifically, your instructor will email students and post an announcement in Canvas course website in the event of moving to remote learning.

Catalogue Description

Biol. 323 introduces vascular plant diversity. It encompasses basic principles of plant systematics (methods of classification, description, nomenclature, taxonomy and identification keys), practical experience with the identification of vascular plants, and tempos and patterns of plant distribution, reproduction, speciation and evolution.

Prerequisites: Biol. 121 and Biol. 222 or instructor's approval.

Learning Outcomes

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

- Master the basic concepts of nomenclature and classification.
- Understand the structure, function and relationship between flowers, fruits, and seeds as well as floral evolution and pollination syndromes across different plant lineages.
- Acquire general knowledge about plant structure and the necessary terminology to identify plants using dichotomous keys. Emphasis is on the flora of Saskatchewan.

- Understand plant phylogeny and tempos and modes of origin, evolution and diversification of land plants, emphasizing major flowering plant groups.
- Develop an appreciation of the fundamental role of plant taxonomy, botanical and natural history collections to other disciplines.

Information on literal descriptors for grading at the University of Saskatchewan can be found at:
http://students.usask.ca/academics/grading/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://policies.usask.ca/policies/academic-affairs/academic-courses.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:

https://teaching.usask.ca/about/policies/learning-charter.php

Course Overview

Welcome to Biol. 323 – *Plant Systematics and Evolution*.
In this course we will learn very neat things about plant lifestyles, evolutionary history, scientific names, uses and relationships with humans (and other animals).

We will also learn to improvise and be creative to learn basic botanical language, principles of classification, and the associated phylogeny and evolutionary history of plants. I make special efforts to provide as much support as I possibly can.

Philosophy – I am aware that many of the concepts we teach in botany are highly technical. This is why I employ interactive and engaging teaching methods to make the subject matter more likeble and interesting to all students.

A significant part of the experiencial learning in this course includes hands-on learning different plant lineages and native plants both in lecture and labs in a fun and interesting manner. We will learn to distinguish plant structures and their associated functions and taxonomic occurrence. I expect that we all engage in discussion of various interesting ideas, as well as examine fresh materials (flowers!) even in these challenging times of the COVID-19 pandemic.

Supplies needed to dissect plant parts: You will need several small lab tools, including 2 dissecting needles, forceps, ruler, and a single-edge razor blade. A 10X hand-lens is highly recommended.

Class Schedule

Date	Lecture Topic	Reading Assignment	Lab Topic
Sept. 2	Course overview		
Sept. 5	**NO CLASS** – Labour Day		
Sept. 7	Introduction to Plant Systematics	Ch. 1 pp 1-11	
Sept. 9	Classification: Types and History	Ch. 3 pp. 49-63	
Sept. 12	Botanical Nomenclature	Appendix 1: 589-599; Ch. 4 pp. 65-73	Lab 1 – Veget. Struct.
Sept. 14	Flower and Fruit Evolution - I	Ch. 4 pp. 73-94	
Sept. 16	Flower and Fruit Evolution - II		
Sept. 19	Molecular Systematics & Cladistics	Ch. 2 pp. 13-23	Lab 2 – Repr. Struct..
Sept. 21	Overview of Vascular Plant Phylogeny I	Ch. 6 pp. 157-181	
Sept. 23	Ferns	Ch. 7 pp. 194-216	
Sept. 26	Gymnosperms	Ch. 7 pp. 217-231	Lab 3 – Ferns & Gym.
Sept. 28	Vascular Plant Phylogeny II	Ch. 8 pp. 237-244	
Sept. 30	ANA Grade	Ch. 8 pp. 244-249	
Oct. 3	Magnoliid Complex, Non-Monocot Paleoherbs	Ch. 8 pp. 250-262	4 - ANA & Magnoliid
Oct. 5	Monocots I – Phylogenetic overview		
Oct. 7	**MIDTERM I (through Oct. 5th & Lab 4)**		
Oct. 10	**NO CLASS** – Thanksgiving		
Oct. 12	Monocots II – Zingiberales & Poales		
Oct. 14	Monocots III – Grasses – Poales (continued)		
Oct. 17	Eudicots – Basal Tricolpates		Lab. 5 Monocots
Oct. 19	Superrosids - Fabids		
Oct. 21	Superrosids - Malvids		
Oct. 24	Superasterids - Caryophyllales I	Ch. 9 pp. 318-342	Lab. 6 - Superrosids
Oct. 26	Superasterids - Caryophyllales II		
Oct. 28	Cactaceae		
Oct. 31	Asterids I	Ch. 9 pp. 441-508	Lab. 7 - Caryophyllales
Nov. 2	Asterids II		
Nov. 4	**MIDTERM II (through Nov. 4th and Lab 7)**		
Nov. 7-11	**NO CLASS** – Fall mid-term break		
Nov. 14	TOUR: Herbarium: Uses, Purposes, Services	Appendix 2: pp. 553-565 Collection management	Lab. 8 - Asterids
Nov. 16	Angiosperm origins and diversity - I	T.F. Stuessy Paper	
Nov. 18	Angiosperm origins and diversity - II		
Nov. 21	Reproductive Biology & Pollination	Ch. 4 pp. 67-72	9 - Project ID Lab
Nov. 23	Plant Speciation	Ch. 6 pp. 119-132; 144-46	
Nov. 25	Hybridization & Polyploidy	Ch. 6 pp. 132-144	
Nov. 28	World Plant Communities		10 – Project ID Lab
Nov. 30	Biodiversity	TBA	
Dec. 2	Biodiversity Hotspots & Conservation		Plant Collection Due
Dec. 5	**LAB FINAL**		**11 - Final Lab Exam**
Dec. 7	Review Qs & As		
Dec. ??	Theory Final – TBD by USASK exam schedule		

Note: Readings assignments are based on Judd et al. 2016 (see recommended resources)

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 (Dec. 8 - 22); 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://students.usask.ca/academics/exams.php

Length and Mode of Final Examination
Theory Final – The final lecture exam will have a duration of 3 hours and will encompass a combination of multiple choice, short and essay questions.

Laboratory Final – It will be the last laboratory session and will have a duration of 3 hrs.

Required Activities Outside of Class Time
N/A

Required and Recommended Resources
Lecture:
- Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. and Donohue, M.J. 2016. *Plant Systematics: A Phylogenetic Approach*, 4th Ed., Sinauer Assoc., Inc. ISBN: 0-87893-403-0. Call No: QK95.P58 2008. Sections of the e-book will be made available on Canvas.
- Simpson, M.G. 2010. *Plant Systematics*. 2nd. Ed., Elsevier Acad. Press. Amsterdam. ISBN: 9780123743800. Call No. QK95.S566.
- *Supplementary Lecture Notes and Lab Manual for Biol. 323* will be made available by Dr. Cota-Sanchez. Additional handouts will be posted on Canvas before lab sessions whenever necessary.

Electronic Resources
- Simpson, M.G. 2010. *Plant Systematics*. 2nd. Ed., Elsevier Acad. Press. Amsterdam. ISBN: 9780123743800. Call No. QK95.S566. The e-book will be made available on Canvas.

Supplementary Laboratory Resources
- Harris, J.G. and M.W. Harris. 2001. *Plant Identification Terminology. An Illustrated Glossary*. 2nd Ed. Spring Lake Publishing.
- 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. 2014. *The Grasses of Saskatchewan,* fascicle 4. Flora of Saskatchewan Association, Nature Saskatchewan, Regina, SK.

Grading Scheme

REQUIRED COURSE COMPONENTS	% OF GRADE	DATE(S)
Theory midterm I	10%	October 7, 2022
Theory midterm II	10%	November 4, 2022
Laboratory final exam	15%	December 5, 2022
Lab quizzes & assignments	10%	Every lab session
Plant collection	25%	During lab sessions – Due Dec. 2, 2022
Theory final	30%	December ???, 2022 – Univ. Exam
Total	100%	

Evaluation Components

See above and descriptors below.

Midterm 1 and 2 will be written and scheduled during class time (50 min).
Value: Each midterm is worth 10% of final grade.
Date: See Course Schedule
Type: These exams will be in-person during class time.
Description: These exams consist of fill-in the blanks, short answers, and essay question(s) about topics discussed in lecture. Electronic devices will not be permitted.

Final Exam will be written and scheduled by USASK's Exam Schedule Office.
Value: Final exam is worth 30% of final grade
Date: As determined by scheduling office
Type: This is a closed-book in-person exam.
Description: The exams consist of fill-in the blanks, short answers and essay questions.
Note that 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. Electronic devices will not be permitted.

Laboratory Final Exam
Value: Final exam is worth 15% of final grade
Date: Dec. 5, 2022
Type: The exam will consist in the proper identification (plant family, genus and species, including nomenclatural rules) of three different native plant species using dichotomous keys (provided by instructor). The specimens provided will be herborized. Electronic devices will not be permitted.

Plant Collection
Value: This is an individual summer project worth 25% of the final grade.
Date: Dec. 2, 2022 or earlier.
Type: Individual project at student pace.
As indicted in early emails, a personal plant collection consisting of 40 native (not cultivated) plants properly pressed, identified and labelled is a requirement to complete this course. Students without plant collection will be unable to complete this course. This project is aimed to train students in plant parts and identification skills. Identification of plants will be conducted during laboratory sessions and instruction for labelling specimens will be provided during labs and visit to the university herbarium.

Submitting Assignments
Whenever necessary, students should submit assignments as PDF or MSWord format via email. Number of words/pages and citation of literature references will be indicated n the assignment.

Late Assignments
I will accept late assignments only for three (3) working days beyond the due date. The penalty for your delay is 10 percent per day of lateness from the value of the assignment, including weekend days. Extensions may be granted only in exceptional circumstances (such as significant illness or emergency).

Criteria That Must Be Met to Pass
Completion of ***all*** required course components as indicated in the Grading Scheme category are compulsory to pass the course.

Attendance Expectations
Students are expected to attend all lectures and lab sessions. Please notify and contact your instructor (via email or Canvas) if you are unable to attend classes and check Canvas course website for recorded lectures. Also, communicate with you classmates to obtain lecture notes.

Experiential Learning
This componenet won't be evaluated, but students are encouraged to participate actively in lecture, laboratory sessions, and get involved with plant parts and functions in their own living environment and neighboring parks. Participating and communicating is very important to effectively enhance your abilities to identify plants and their parts on the spot. Therefore, it is extremely important that students devote extra time to develop the minimum skills and knowledge to identify plants.

Recording of the Course
Your instructor may record the synchronous activities. These recordings will be retained for one year and then destroyed. Students are not allowed to record any aspect of this course, except with the permission of the instructors or as provided for by arrangements with Access and Equity Services.

Any recording made under these provisions are to only be used for the personal learning of the student who made the recording. For questions about recording and use of sessions in which you have participated, including any concerns related to your privacy, please contact your instructor. More information on class recordings can be found in the Academic Courses Policy https://policies.usask.ca/policies/academic-affairs/academic-courses.php#5ClassRecordings.

Copyright
Course materials are provided to you based on your registration in a class, and anything created by your professors and instructors is their intellectual property and cannot be shared without written permission. If materials are designated as open education resources (with a creative commons license) you can share and/or use in alignment with the CC license. This includes exams, PowerPoint/PDF slides and other course notes. Additionally, other copyright-protected materials created by textbook publishers and authors may be provided to you based on license terms and educational exceptions in the Canadian Copyright Act (see http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html).

Before you copy or distribute others' copyright-protected materials, please ensure that your use of the materials is covered under the University's Fair Dealing Copyright Guidelines available at https://library.usask.ca/copyright/general-information/fair-dealing-guidelines.php. For example, posting others' copyright-protected materials on the open web is not covered under the University's Fair Dealing Copyright Guidelines, and doing so requires permission from the copyright holder. For more information about copyright, please visit https://library.usask.ca/copyright/index.phpwhere there is information for students available at https://library.usask.ca/copyright/students/rights.php, or contact the University's Copyright Coordinator at mailto:copyright.coordinator@usask.ca or 306-966-8817.

Student Feedback

I will welcome student feedback on course components, evaluations and lecture material. Your feedback is significant to improve delivery of lecture and lab material.

Integrity Defined (from the Office of the University Secretary)

The University of Saskatchewan is committed to the highest standards of academic integrity (https://academic-integrity.usask.ca/). Academic misconduct is a serious matter and can result in grade penalties, suspension, and expulsion.

Prepare for Integrity

Students are expected to act with academic integrity.

- Students are encouraged to complete the Academic Integrity Tutorial to understand the fundamental values of academic integrity and how to be a responsible scholar and member of the USask community (tutorial link: https://libguides.usask.ca/AcademicIntegrityTutorial) .
- Students can access campus resources that support development of study skills, time and stress management, and ethical writing practices important for maintaining academic integrity and avoiding academic misconduct.

Responses to Misconduct

Students are expected to be familiar with the academic misconduct regulations (https://governance.usask.ca/student-conduct-appeals/academic-misconduct.php#About).

- Definitions appear in Section II of the academic misconduct regulations.
- The academic misconduct regulations apply regardless of type of assessment or presence of supervision during assessment completion.
- Students are advised to ask for clarification as to the specific expectations and rules for assessments in all of their courses.
- Students are urged to avoid any behaviour that could result in suspicions of cheating, plagiarism, misrepresentation of facts. Students should note that posting copyrighted course materials (e.g., notes, questions, assignments or exams) to third party websites or services or other forum or media without permission is an academic or non-academic misconduct offense.

Non-academic offenses are dealt with under the Standard of Student Conduct in NonAcademic Matters and Regulations and Procedures for Resolution of Complaints and Appeals.

Access and Equity Services (AES) for Students

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals at any time. Those students who are registered with AES with mental health disabilities and who anticipate that they may have responses to certain course materials or topics, should discuss course content with their instructors prior to course add / drop dates. In order to access AES programs and supports, students must follow AES policy and

procedures. For more information or advice, visit https://students.usask.ca/health/centres/access-equity-services.php, or contact AES at 306-966-7273 or aes@usask.ca.

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

For information on AES services please visit:
https://students.usask.ca/health/centres/access-equity-services.php#Hoursandcontact

Student Supports

Academic Help for Students
The University Library offers a range of learning and academic support to assist USask undergrad and graduate students. For information on specific services, please see the Learning page on the Library web site https://library.usask.ca/support/learning.php.
Remote learning support information https://students.usask.ca/remote-learning/index.php
Class and study tips https://students.usask.ca/remote-learning/class-and-study-tips.php
Remote learning tutorial https://libguides.usask.ca/remote_learning
Study skills materials for online learning https://libguides.usask.ca/studyskills
A guide on netiquette, principles to guide respectful online learning interactions
https://teaching.usask.ca/remote-teaching/netiquette.php

Teaching, Learning and Student Experience
Teaching, Learning and Student Experience (TLSE) provides developmental and support services and programs to students and the university community. For more information, see the students' web site http://students.usask.ca.

Financial Support
Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact Student Central (https://students.usask.ca/student-central.php).

Aboriginal Students' Centre
The Aboriginal Students' Centre (ASC) is dedicated to supporting Aboriginal student academic and personal success. The centre offers personal, social, cultural and some academic supports to Métis, First Nations, and Inuit students. The centre is also dedicated to intercultural education, brining Aboriginal and non-Aboriginal students together to learn from, with and about one another in a respectful, inclusive and safe environment. Students are encouraged to visit the ASC's Facebook page (https://www.facebook.com/aboriginalstudentscentre/) to learn more.

International Student and Study Abroad Centre
The International Student and Study Abroad Centre (ISSAC) supports student success and facilitates international education experiences at USask and abroad. ISSAC is here to assist all international undergraduate, graduate, exchange and English as a Second Language students in their transition to the University of Saskatchewan and to life in Canada. ISSAC offers advising and support on matters that affect international students and their families and on matters related to studying abroad as University of Saskatchewan students. Please visit students.usask.ca for more information.