

COURSE SYLLABUS

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|------------------------|----------------------------------------|----------------------------------|
| COURSE TITLE: | <i>Plant Systematics and Evolution</i> | |
| COURSE CODE: | 81866 | TERM: 01 |
| COURSE CREDITS: | 3 | |
| CLASS SECTION: | | START DATE: Sept. 3, 2020 |
| CLASS TIME: | MWF 9:30-10:20 am | LAB TIME: W 1:30-5:20 pm |

Instructor Information

J. Hugo Cota-Sánchez, Ph.D.

Collaborative Science Research Building (CSRB), Office 320.9

Webex Contact Information → Virtual Classroom

Webex Personal Room: <https://usask.webex.com/meet/hugo.cota>

Webex Personal Number: 920 022 663

Contact Information

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 knowledge while promoting the development of critical thinking, scientific 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.

Course Description

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

Prerequisites

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

Remote Learning Context

We remind our students about the complex circumstances we are currently experiencing due to Covid-19 situation. Consequently, this course will be taking place remotely (see [Webex Virtual Classroom information in Instructor's section above](#)). Please note that the remote teaching and learning context is new to most of us. I am therefore asking all the participants in the course to interact with empathy and care. There might be unforeseen circumstances in which digital technology and remote teaching will give us unexpected challenges to deal with.

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 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 origin, evolution 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://policies.usask.ca/policies/academic-affairs/academic-courses.php>

[Academic Courses Policy on Class Delivery, Examinations, and Assessment of Student Learning: Arts and Science Edition.](#)

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

Course Overview

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 less intimidating, engaging and interesting to all students.

A significant part of the learning experience in this course includes hands-on learning plant lineages 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. Even when we will be challenged by the new format of online delivery of lectures and lab sessions, I expect that we all engage in discussion of various interesting ideas, as well as examine fresh materials (flowers!) from our own virtual offices.

We all 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.

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 – Readings based on Judd et al. 2016 (see recommended resources)

| Date | Lecture Topic | Reading Assignment | Lab Topic |
|-------------|-----------------------------------------------------------------------|--------------------------------------------------|-------------------------------------|
| Sept. 4 | Course overview | | |
| Sept. 7 | NO CLASS – Labour Day | | |
| Sept. 9 | Introduction to Plant Systematics | Ch. 1 pp 1-11 | No Lab |
| Sept. 11 | Classification: Types, History & Nomenclature | Ch. 3 pp. 39-52; 543-52 | |
| Sept. 14 | Phytography: Vegetative & Reproductive Parts | Ch. 4 pp. 53-61 | |
| Sept. 16 | Flower and Fruit Evolution - I | Ch. 4 pp. 61-66 | 1 – Veget. Struct |
| Sept. 18 | Flower and Fruit Evolution - II | Ch. 4 pp. 72-81 | |
| Sept. 21 | Molecular Systematics & Cladistics | Ch. 2 pp. 13-37; Ch. 5 pp. 103-117 | |
| Sept. 23 | Overview of Vascular Plant Phylogeny I | Ch. 7 pp. 153-180 | 2 – Reprod. Struct |
| Sept. 25 | Ferns & Gymnosperms | Ch. 8 pp. 185-221 | |
| Sept. 28 | Vascular Plant Phylogeny II | Ch. 9 pp. 225-231 | |
| Sept. 30 | ANITA Grade | Ch. 9 pp. 232-235 | 3 - Ferns & Gymnosp. |
| Oct. 2 | Magnoliid Complex, Non-Monocot Paleoherbs and Basal Tricolpates | Ch. 9 pp. 236-247; 307-317 | |
| Oct. 5 | Magnoliid Complex, Non-Monocot Paleoherbs and Basal Tricolpates II | | |
| Oct. 7 | Caryophyllales and allies I | Ch. 9 pp. 318-342 | 4 - ANITA & Magnoliids |
| Oct. 9 | MIDTERM I (through Oct. 2nd & Lab 4) | | |
| Oct. 12 | NO CLASS – Thanksgiving | | |
| Oct. 14 | Caryophyllales and allies II – Saxifragales | | 5 - Caryophyllales |
| Oct. 16 | Cactaceae | | |
| Oct. 19 | Rosids I | Ch. 9 pp. 346-440 | |
| Oct. 21 | Rosids II | | 6 - Rosids |
| Oct. 23 | Asterids I | Ch. 9 pp. 441-508 | |
| Oct. 26 | Asterids II | | |
| Oct. 28 | Asterids III - Asteraceae | Ch. 9 pp. 508-515 | 7 - Asterids |
| Oct. 30 | Monocots I | Ch. 9 pp. 249-282 | |
| Nov. 2 | Monocots II – Zingiberales & Poales | Ch. 9 pp. 285-304 | |
| Nov. 4 | Monocots III – Grasses – Poales (continued) | | 8 - Monocots |
| Nov. 6 | MIDTERM II (through Nov. 4 and Lab 8) | | |
| Nov. 9-13 | NO CLASS – Fall mid-term break | | |
| Nov. 16 | VIRTUAL TOUR: Herbaria & Museum Collections: Uses, Purposes, Services | Appendix 2: pp. 553-565 Collection management | |
| Nov. 18 | Angiosperm origins and diversity - I | T.F. Stuessy Paper | 9 - Project ID Lab |
| Nov. 20 | Angiosperm origins and diversity - II | | |
| Nov. 23 | Reproductive Biology & Pollination | Ch. 4 pp. 67-72 | |
| Nov. 25 | Plant Speciation | Ch. 6 pp. 119-132; 144-46 | 10 – Virtual Tour to World Herbaria |
| Nov. 27 | Hybridization | Ch. 6 pp. 132-144 | |
| Nov. 30 | Polyploidy | | |
| Dec. 2 | World Plant Communities | TBA | 11 - Final Lab Exam |
| Dec. 4 | Biodiversity, Biodiversity Hotspots & Conservation | TBA | |
| Dec. 6 | 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; 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 a take home exam.

Required Activities Outside of Class Time

N/A

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. **The e-book will be made available on Canvas.**
- *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.

Optional 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.

Electronic Textbooks

See above

Other Required Materials

Electronic Resources

Online resources will be provided to students according to course development.

Supplementary Resources

Will be made available on Canvas whenever necessary.

Grading Scheme

REQUIRED EXAMINATION, COURSE WORK & GRADING SYSTEM FOR BIOL. 323

| REQUIRED COURSE COMPONENTS | % OF GRADE | DATE(S) |
|------------------------------------|-------------|---------------------------------|
| Theory midterm I | 15% | October 9, 2020 |
| Theory midterm II | 15% | November 6, 2020 |
| Laboratory final exam | 15% | December 2, 2020 |
| Theory final | 35% | December ???, 2020 – Univ. Exam |
| Lab presentation and participation | 20% | During lab sessions |
| 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 15% of final grade

Date: See Course Schedule

Type: These exams will be virtual and invigilated remotely.

Description: These exams consist of fill-in the blanks, short answers, and essay question(s).

Final Exam will be written and scheduled by USASK's Exam Schedule Office.

Value: Final exam is worth 35% of final grade

Date: As determined by scheduling office

Type: This exam will be virtual and invigilated remotely.

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.

Laboratory Final Exam

Value: Final exam is worth 15% of final grade

Date: Dec. 2, 2020

Type: Take-home exam

Student Presentation and Participation (Discussion Forums for online classes)

Value: 20% of final grade

Date: During lab sessions - see Course Schedule

Type: Student presentation

Description: There will be one (or two) lead presenter(s) discussing a specific plant group or phylogenetic clade each lab. All students are expected to discuss and participate in the topic.

Submitting Assignments

Students should submit assignments as PDF or MSWord format via email. Number of words/pages and citation of literature references will be indicated in the assignment.

Late Assignments

I will accept late assignments only for five (5) 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

A minimum of 70% attendance is expected to pass the course.

Experiential Learning

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. Because of the remote settings I won't be able to effectively evaluate your abilities to identify plants on the spot. Therefore, it is extremely important that students devote extra time to develop the minimum skills and knowledge to identify plants.

Recommended Technology for Remote Learning

Students are reminded of the importance of having the appropriate technology for remote learning. The list of recommendations can be found at <https://students.usask.ca/remote-learning/tech-requirements.php>.

Recording of the Course

Course instructors may record the synchronous activities conducted in Webex meetings for the purpose of determining course contribution marks. 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>.

Required Video Use

At times in this course you will be required to have your video on during video conferencing sessions. It will be necessary for you to have use of a webcam built into or connected to your computer. For questions about use of video in your sessions, including those related to your privacy, contact your instructor.

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, unless materials are designated as open education resources. 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>).

Student Feedback

I would appreciate student feedback. Anonymous or not, information regarding the new remote course delivery systems, course content and structure, or any other suggestion is useful to improve course content and delivery.

Integrity in a Remote Learning Context

Although the face of teaching and learning has changed due to covid-19, the rules and principles governing academic integrity remain the same. If you ever have questions about what may or may not be permitted, ask your instructor. Students have found it especially important to clarify rules related to exams administered remotely and to follow these carefully and completely.

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 (<https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php>) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (<https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php#IXXIIAPPEALS>)

For more information on what academic integrity means for students see the Academic Integrity section of the University Library Website at: <https://library.usask.ca/academic-integrity#AboutAcademicIntegrity>

You 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 - <https://library.usask.ca/academic-integrity.php#AcademicIntegrityTutorial>

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 and remote learning please visit <https://updates.usask.ca/info/current/accessibility.php#AccessandEquityServices>

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/study/remote-learning.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>.

College Supports

Students in Arts & Science are encouraged to contact the Undergraduate Student Office and/or the Trish Monture Centre for Success with any questions on how to choose a major; understand program requirements; choose courses; develop strategies to improve grades; understand university policies and procedures; overcome personal barriers; initiate pre-career inquiries; and identify career planning resources. Contact information is available at:

(<http://artsandscience.usask.ca/undergraduate/advising/>)