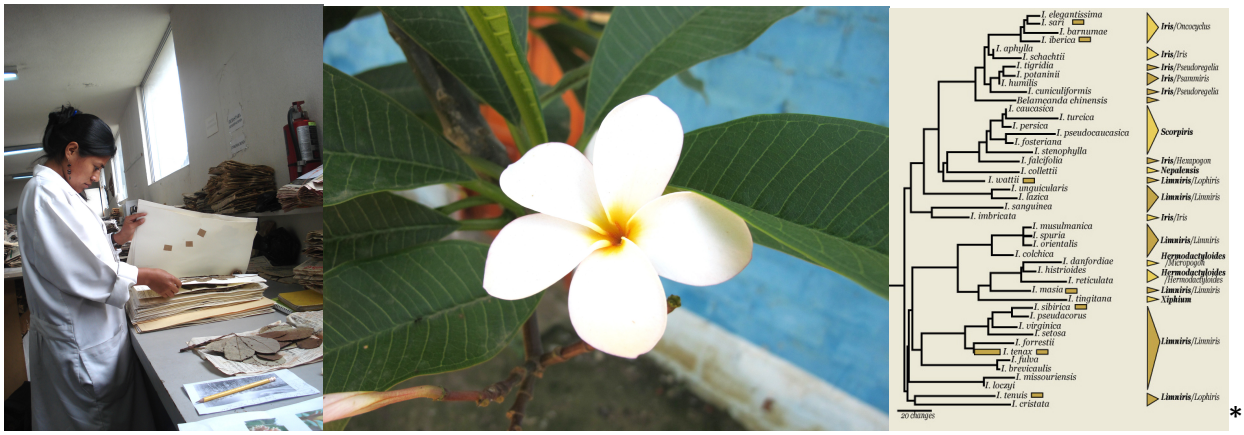
BI 442/542 Systematic Botany

¡Spring 2021 Remote Edition!



*Wilson, C. A. 2004. Phylogeny of *Iris* based on chloroplast *matK* gene and *trnK* intron sequence data. Molecular Phylogenetics and Evolution **33**:402-412. (Other photos © T. Policha)

Dr. Tobias Policha (Instructor) tpolicha@uoregon.edu. (541) 513-8263
Zoom office hours: Wednesday 11:00 - 12:00; or by appointment.
Sarah Erskine (G.E.) serskine@uoregon.edu
Zoom office hours: Monday 14:00 - 15:00.
Maxi Muessig (Lab Assistant) mmuessig@uoregon.edu
Zoom office hours: Thursday 12:00-13:00.

***All Office Hours & Synchronous sessions held at:* https://uoregon.zoom.us/j/93606216705**

Asynchronous Lecture Activities due MWF; Weekly quizzes due on Sunday evening
Interactive Lab Sessions on Zoom: Mondays & Wednesdays 12:15 - 13:45
In-Person Plant Walks: Weeks 1,2 & 9; **In-Person Fieldtrip**: Saturday May 8th

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Goals & Objectives -> Format -> Materials -> Assessments -> Policies -> Resources -> Schedule

Course Goals

Acquire the skills to describe and identify flowering plants
Develop the essential field skills of observation and documentation
Increase awareness of plants in all aspects of our lives

Course Objectives

Plant systematics is the study of plant diversity. We will focus on flowering plants. Through lectures, laboratories, field trips, and scholarship you will learn:

1. How to describe and classify plant diversity
2. The major features and evolutionary origins of flowering plants
3. What causes variation in plant characteristics
4. Identification of plants using dichotomous keys
5. Recognition of important angiosperm families
6. Recognition of local flora
7. Knowledge of food plants
8. Plant ecology

Note on the Context of this Course (COVID-19)

Welcome to Systematic Botany! I am so glad that you are interested in this class. It is hands-down, my favorite class to teach, and one of the main reasons that I went into teaching as a profession. I never thought that I would have to do it online, but we actually had a pretty good time last spring, so I am optimistic.

I want to acknowledge that we are all experiencing things outside the bounds of normalcy and that each of us are being stressed in ways that we have not entirely anticipated. This impacts our learning communities as much as any other aspect of our lives. I urge us all to remember that we did not sign up for this. Not for the sickness, not for the quarantine, not for being forced into taking online classes. We will get through this though, by prioritizing each other as human beings, by prioritizing simple solutions that work for the most people, and by sharing resources and communicating clearly. We will remain flexible and adjust to the situation as needed. **Everyone needs support and understanding** in this unprecedented moment.

I want you to know that **I stand in firm solidarity with those that are demanding social justice**. I realize that the events of the last year are impacting each of you in unique ways, some of which may be difficult for others to understand. I am doing my best to encourage inclusivity and understanding around the unique issues faced by our black students and other students of color, and **I encourage all of us to extend an extra measure of kindness and care to each other** as we collectively seek a more unified community.

In light of everything, I want you to know that I am open to working with you on a range of accommodations to help you feel successful in our class. Please **contact me early with any anticipated issues**, it will be easier for me to help you if it does not become a last-minute emergency.

The good news is that at this point most of us have some experience with 'remote' courses, and now we know what we are signing up for. I plan on encouraging active collaboration and discussion in this course, and encourage everyone, as much as possible, to attend the remote meeting sessions on Zoom. We will work on projects in small groups and discuss material as a class. It is my understanding that even when this pandemic is 'over,' the nature of work may be changed forever. As someone that has led international, multi-institution, research endeavors, I can appreciate how some of the remote collaboration skills that we are developing together could be very useful in a variety of post-pandemic applications.

As an in-person, 5-credit class, this course usually meets for one hour-long plant walk, six hours of lab, two hours of lecture, and an average of two hours of field trips EACH WEEK. Obviously this is difficult to emulate. I bring it up for at least three reasons though. 1) to give you an understanding of what we are trying to recreate – I may call on you to use your imagination more than once! 2) justify the five upper division Biology credits that you will receive, and 3) let you know that you will be expected to put a significant amount of time into this course to be successful. This class usually has eleven hours of face-to-face contact per week, I suspect that you will do well to budget **AT LEAST 15 HOURS PER WEEK** for this course. 4) is to just also say how sad I am not to get to share this glorious spring being outside in Oregon with you all!

I intend to facilitate a learning experience that will be of value to you in a post-pandemic world. I truly believe that the awareness and the skills that we will develop together this term will go a long way toward **promoting a more sustainable and resilient world**, whatever the future holds.

"*If there's any good to come of it, I'm trying to think of it as a reminder that despite our illusions of human exceptionalism, natural processes are still in charge,*
and (of) the importance of our collective responsibilities toward one another."
- Robin Kimmerer on the COVID-19 pandemic

Course Format

There will be lots of self-directed, guided exploration, there will be opportunities for live whole-course interactions, there will be opportunities for one-on-one help sessions, I will do my best to facilitate study groups and lab-partners. You will go outside (safety permitting – given that we are not all in the same geographical location, it may not be safe for everyone to go outside to look at plants, please use common sense and good judgement, and put your and your community's safety first. Let me know ASAP if this will be a challenge for you and I will work with you to come up with alternative assignments), you will look at plants, you will draw plants, you will learn a new vocabulary.

I will post three pre-recorded lectures each week. There will be reading quizzes and lecture quizzes associated with each of these that will be due by noon on MWF (to prepare you for the synchronous Zoom sessions). You will be tasked with completing assignments and lab activities on your own. We will have two interactive Zoom sessions per week that will be recorded and available on-demand (for those that cannot attend). These will include introductions to the activities, group discussions, Q&A sessions, plant 'walks', and more!

Course Materials

Textbooks a may be purchased or rented in-store or online through UODuckStore.com; print materials will be shipped free to UO students.

REQUIRED BOOKS

Simpson. MG. Plant Systematics. Elsevier Press, Burlington, MA. (2nd or 3rd ed. okay)

Hitchcock, C. L. and A. Cronquist. 2018. Flora of the Pacific Northwest 2nd ed. University of Washington Press, Seattle & London. 978-0295742885.

REQUIRED LAB/FIELD SUPPLIES

You will be issued a **"Botany Kit"** that *you must either pick up from campus or receive in the mail.* It will include a **10X hand lens, a probe, forceps, razor blade, metric ruler, and a 4x macro lens for a smartphone camera.** You will also need drawing paper and pencils/pens, a Rite-in-the-Rain notebook and pencils for note-taking in the field (pen is not water resistant!).

REQUIRED TECHNOLOGY

It is expected that you will have access to a computing device that will allow you regular access and use of the following technologies. *If you face Internet access challenges: computer labs are open for students at the Eugene campus. Some companies are offering free access during this challenging time. To learn more about options visit Information Services' web page on going remote.*

Access to Canvas. We will be using Canvas daily for content delivery, communication and assessment. If you have questions or concerns about accessing and using Canvas, visit the Canvas support page. Canvas and Technology Support also is available by phone or live chat: 6 a.m.–12 a.m. 541-346-4357 livehelp.uoregon.edu

Access to Zoom. We will have three live Zoom sessions each week. It will be very useful for you to learn how to navigate this technology. Please plan to either have your video turned on when you join Zoom, or post a photo as an avatar.

An iNaturalist account and a camera (phone ok). You will be responsible for contributing 20 observations to our course project.

Join our Slack workspace to facilitate real-time and asynchronous communication and collaboration. Slack was designed for business communications, not FERPA compliance, communication about

sensitive student information, including grades and personal information, should take place on another platform.
Google Docs may be used for collaboration.
A Camera (phone ok) or a scanner to submit drawings.

Optional Resources (books and apps):

Harris, JG. and MW. Harris. 2001. Plant identification terminology: An illustrated glossary. 2nd ed. Spring Lake Publishing, Spring Lake, UT.
Wildflower Search App. https://wildflowersearch.org/search?page=Apps
Oregon Flora Project. 2014. Oregon Wildflowers App. http://www.highcountryapps.com/OregonWildflowers.aspx
Pojar and MacKinnon. 2004. Plants of the Pacific Northwest coast. Revised ed. Lone Pine Publishing, Auburn, WA.
Elpel T.J. Any edition. Botany in a day. HOPS Press, Pony MT.

Assignments & Assessments*

Assessment	#	% Each	Total
Labs	19	1	19
Lecture Activities (drop 1)	27	0.5	13
DRQs (drop 2)	27	0.5	12.5
iNaturalist 'Collections'	20	0.5	10
Practical Quizzes	9	1	9
Final Practical	1	7	7
Final Exam	1	7	7
Midterm Exam	1	5	5
Monograph	1	5	5
Domestic Botanical Inventory	1	4	4
Field Journals	4	1	4
Discussion Posts	5	0.5	2.5
		TOTAL	**100**

***Graduate students** must complete an additional independent project in order to receive 500-level credit. This will be based on a discussion about your research themes and goals that will take place within the first three weeks of the term. Please contact me to arrange a meeting.

LABS

There will be two major lab activities each week. They will be based on the material in the readings and lectures. You can work on these at your own pace on your own time, however we WILL have synchronous Zoom sessions to work on the material together. Labs will typically be due on Mondays and Wednesdays.

LECTURES (on Canvas)
To increase your understanding, you should try to do the assigned readings and take the 'daily reading quizzes' (DRQs) before engaging with the lecture materials. In order to promote your active engagement with the material, the lectures themselves will be accessed through a quiz on Canvas and will include a series of short videos that are broken up by quiz questions or Discussion posts. Lectures will be captured in Panopto™ and will include videos of me speaking, my presentation slides and videos, and the option to include closed-captioning. I will also post PDFs of the lecture slides and links to other videos and resources will be included as appropriate. Your two lowest score will be dropped.

DRQs
Daily **R**eading **Q**uizzes are intended to keep you up-to-date and on track with the course materials. They will largely be based on the readings from the Simpson, with occasional other materials included. All readings are included on the Course Schedule. These quizzes will be untimed. You are welcome to discuss your ideas with other students, but you should do your own work and not simply get answers from other students. Your two lowest scores will be dropped.

iNATURALIST 'COLLECTIONS'
As a way to get you out and identifying plants on your own, you will be responsible for making and posting observations (safety permitting) to the iNaturalist citizen science platform. Further details will be available in the Assignments section of Canvas.

PRACTICAL QUIZZES
These weekly quizzes will open on Friday mornings and be due by midnight on Sundays. You will have limited time to complete them once you start. They will ask you to describe morphological features, identify plant species, or recognize plant families, based on images provided. Thoughtful completion of the lab activities and studying the lecture material will prepare you for these quizzes. You are expected to do your own work. ***Points will be deducted for misspelling.***

FINAL PRACTICAL
This will be very similar to the weekly practical quizzes (see above), simply longer. You will have three hours to complete it.

MIDTERM & FINAL EXAMS
Both the midterm and the final exams will be standard written exams, with a range of multiple choice, matching, true/false, fill-in-the-blank, and short answer questions. They will cover subjects and vocabulary presented in lecture or lab, whether that material is in the textbook or not. Furthermore, you are expected to know what is in the assigned reading, even if we don't cover that material in lab or lecture. Exams will be taken as 'Quizzes' on Canvas and will be timed.

MONOGRAPH
A substantial project in this class will be to write a monograph on a plant of your choice. This is a written assignment that will include references to the scientific literature. Your monograph must include aspects of botany, ecology/biogeography, and economic uses. You may also include other information about your plant that you find interesting or relevant. Part of this project will include engaging in a peer-review process. This project will be introduced in class and more details including a rubric will be posted to Canvas.

DOMESTIC BOTANICAL INVENTORY
As a way to appreciate the role of plants and plant products in our daily lives, we will conduct a botanical inventory of our domiciles. Further details will be available in the Assignments section of Canvas.

FIELD JOURNALS
At four points in the term you will required to spend at least one hour outside (safety permitting) making observations of plants and things that depend on plants (which is everything!). You will make notes and sketches, ask questions and develop hypotheses. You will submit electronic copies of your work on Canvas. Further details will be available in the Assignments section of Canvas.

DISCUSSION POSTS
You will be required to post to a course-wide discussion board at five specific points in the term. You will also be required to respond to someone else's post (for all eight discussions). This will hopefully lead to the kind of intellectual interactions that would normally take place in a physical classroom.

COURSE POLICIES

Academic Integrity
All students are expected to complete assignments in a manner consistent with academic integrity. Students must produce their own work and properly acknowledge and document all sources. Students can find more complete information about the University of Oregon's Policy on Academic Dishonesty in the student conduct code (located at dos.uoregon.edu/conduct).

Inclusiveness
Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. We are committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities.

Communication
In general, our class will communicate through our Canvas site. Announcements and emails are archived there and automatically forwarded to your UO email, and can even reach you by text. Check and adjust your settings under Account > Notifications. I will have a running Discussion forum on our Canvas site called "Question Board" for the entire group to ask and answer any questions related to the course.

I will try to make myself as available as possible for questions related to course material. However, I also ask that you pose questions to fellow students as well, you can do this through Canvas. If it pertains to course administration, **double-check the syllabus and Canvas.** If you email after regular business hours you may not hear back from me until the next day. ***Please include "HC 241" in the subject*** *line of all emails.* We will also be using Slack in class to help facilitate communication and collaboration during our Zoom sessions. This workspace will also be available for general communication throughout the term. If you contact me with a question, I will try to respond within one business day. I typically provide feedback on assignments within one week.

Prohibited Discrimination and Harassment
UO is committed to providing an environment free of all forms of prohibited discrimination and harassment, including sex or gender based violence. As an instructor, one of my responsibilities is to help create a safe learning environment for my students and for the campus as a whole. Students experiencing any form of prohibited discrimination or harassment may seek further information on

safe.uoregon.edu, respect.uoregon.edu, titleix.uoregon.edu, or aaeo.uoregon.edu or contact the Title IX office (541-346-8136), Office of Civil Rights Compliance office (541-346-3123), or Dean of Students offices (541-346-3216), or call the 24-7 hotline 541-346-SAFE for help.

ON (OR OFF) CAMPUS RESOURCES

Accessible Education Center (AEC)

The University of Oregon is working to create inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please notify us as soon as possible. You are also encouraged to contact the Accessible Education Center. If you are not a student with a documented disability, but you would like for us to know about class issues that will impact your ability to learn, contact us so that we can strategize how you can get the most out of this course.

In order to promote social distancing to limit the spread of COVID-19, the Accessible Education Center is currently operating remotely. They are available Monday-Friday 8am-5pm by calling (541) 346-1155 or emailing uoaec@uoregon.edu. Appointments can be made by calling, emailing, or completing our online scheduling form.

Appointments are available by **phone or by computer/smartphone using** Microsoft Teams**. Teams is free to the UO community.** For more information, please visit the UO Teams Download Instructions**. Support will also be available through email and a text-based chat window.**

Center for Multicultural Academic Excellence (CMAE)

Promoting student retention and persistence for historically underrepresented and underserved populations. Programs and services that support retention, academic excellence, and success at the UO and beyond. Committed to all students, including undocumented and tuition equity students. cmae@uoregon.edu.

All CMAE advising services will be offered remotely. If you are feeling uncertain or unsure regarding fall term, please connect with us, we are still here providing you support. **To schedule an appointment,** log into Navigate with your Duck ID: http://uo.campus.eab.com or call the front desk at 541-346-3479. You can also access the CMAE Advising Helpdesk live Chat Monday-Friday from 10am-12pm & 1pm-4pm.

Counseling Center

The Counseling Center provides students with confidential consultation 24 hours a day, 7 days a week. Their number is 346-3227. Students often believe that their issues are not "severe" enough for them to call, but at the Counseling Center, no problem is too small. https://counseling.uoregon.edu/.

If you're unable or don't wish to come to the Counseling Center in person, help is still available. Our after-hours support/crisis line is open to all students, wherever you are located. Call 541-346-3227 when the Counseling Center is closed to speak to a therapist. Counseling Center staff can help you figure out how to find mental health services in your area. Call 541-346-3227 during business hours to schedule a consultation with a case manager. We are working to provide telemental health (video) sessions to students physically located in Oregon and California soon. Updates will be posted to this website when available, or call for more information.

"Plants are nature's alchemists, expert at transforming water, soil and sunlight into an array of precious substances, many of them beyond the ability of human beings to conceive, much less manufacture."
— Michael Pollan, The Botany of Desire: A Plant's-Eye View of the World

BI 442/542 SYSTEMATIC BOTANY SCHEDULE 2021

Week	Date	#	LECTURES	#	LABS	Assignments	Simpson 3rd Ed	Simpson 2nd Ed	Additional Readings
0		0	Welcome & Orientation Videos						
1	29-Mar	1	Introduction to Systematic Botany	1	Floral Diversity/ Conifer Tour	DRQ 1; Discussion Post 1	3-16; 469-472	3-16; 451-454	APG III 2009 Intro; APG IV 2016 Intro&Review; What-is-botany?
1	31-Mar	2	Floral Diversity	2	Floral Diversity/ Conifer Tour	DRQ 2	147-153; 153-156; 167-180; 490-511; 691-700	145-151; 151-154; 163-176; 468-489; 669-678	
1	2-Apr	3	Taxonomy			DRQ 3; Quiz 1	17-18; 631-646	611-626	
2	5-Apr	4	Vegetative Diversity	3	Vegetative Diversity/ Plant walk	DRQ 4	483-490; 518-530	461-468; 496-507	
2	7-Apr	5	Using a Dichotomous Key	4	Vegetative Diversity/ Plant walk	DRQ 5	625-630	605-610	Hitchcock 2018 xix-xxx; Flora PNW Errata; Harrington 1985
2	9-Apr	6	Field Methods			DRQ 6; Quiz 2; Discussion Post 2	649-654	629-634	MOBOT Field Manual
3	12-Apr	7	Origins of Angiosperms	5	Fruit Diversity	DRQ 7	180-183	176-178	Pennisi 2009, Sun et al 1998
3	14-Apr	8	Magnoliids: Nymphaeceae, Laurales, Magnoliales, Piperales	6	Magnoliids	DRQ 8	187-191; 193-195; 196-206	181-185; 187; 189-197	

3	16-Apr	9	Selection on Flowers			DRQ 9; Quiz 3; Field Journal 1			
4	19-Apr	10	Monocots I: Araceae, Liliales, Asparagales	7	Monocots I	DRQ 10	206-210; 213-215; 218-236	200-202; 204-208; 213-230	Keltch 2002
4	21-Apr	11	Eudicots: Ranunculales, Saxifragales	8	Eudicots	DRQ 11	285-292; 297-303	275-281, 287-292	
4	23-Apr	12	Selection on Fruit			DRQ 12; Quiz 4; Field Journal 2	515; 602	493; 580	
5	26-Apr	13	Rosids I Fabids I: Malpighiales, Fabales	9	Rosids I Fabids	DRQ 13	305; 307-317; 319-323	312-313; 315-319; 322-326; 328-330	
5	28-Apr	14	Rosids I Fabids II: Rosales, Cucurbitales, Fagales	10	Rosids I Fabids Con'd	DRQ 14	325-328; 333; 335-339	331; 334-335; 339-347	
5	30-Apr	15	Selection on Leaves			DRQ 15; Quiz 5; Midterm Exam			Dunn 2012
6	3-May	16	Rosids II Malvids: Geraniales, Brassicales, Sapindales	11	Rosids II Malvids	DRQ 16	341-343; 350-353; 359-362	347-350; 357-360; 366-371	
6	5-May	17	Superasterids: Caryophyllales (Amaranthaceae, Chenopodiaceae, Cactaceae, Caryophyllaceae, Polygonaceae)	12	Caryophyllales	DRQ 17	365; 367-383	295-312	
6	7-May	18	Species and Speciation			DRQ 18	602-604; 671-684	580-582 & 649-662	
6	**8-May**			**13**	**FIELD TRIPS**	**Quiz 6; Discussion Post 3**			

7	10-May	19	Asterids: Cornaceae, Ericaceae	14	Asterids	DRQ 19;	384-386; 389-391	372-374; 378-380	
7	12-May	20	Asterids II: Lamiids: Boraginales, Lamiales, Solanales	15	Asterids II: Lamiids	DRQ 20;	400-406; 412; 416-425; 428-429	389-394; 400; 402-416	Olmstead 2002
7	**14-May**		**WILDFLOWER BIOBLITZ**			**Quiz 7; Field Journal 3;**			
8	17-May	21	Asterids III: Campanulids: Apiales, Dipsacales	16	Asterids III: Campanulids	DRQ 21;	431-439	419-426	
8	19-May	22	Asteraceae	17	Asteraceae	DRQ 22;	440-445	427-433	
8	21-May	23	Phylogenetics			DRQ 23; Quiz 8; Discussion Post 4	18-47; 607-616; 619; 703-710	17-48; 585-592; 681-689	
9	24-May	24	Plants and Society	18	Plant walk	DRQ 24;			https://en.wikipedia.org/wiki/Human_uses_of_plants
9	26-May				Plant walk				
9	28-May	25	Ethnobotany			DRQ 25; Quiz 9; Domestic Botanical Inventory			Prance 1991; Idu 2009
10	31-May		*NO CLASS*		*MEMORIAL DAY*				
10	2-Jun	26	Commelinids	19	Commelinids	DRQ 26;	237-267	230-260	

10	4-Jun	27	Plant Conservation			DRQ 27; Field Journal 4; Discussion Post 5	684-687	662-665	Antonelli 2020 pp.10-17.
Finals	3-May					Final Practical, Final Exam, Monograph			