

BI 442 Systematic Botany

CRN: 31946
Spring 2022



*Figure from 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 (emergencies only)

Office hour: Friday 11:00 – 11:50. 116 Esslinger, or by appointment.

Hilary Rose Dawson (G.E.) hilaryd@uoregon.edu

Office hour: Thursday 13:00 – 13:50. 116 Esslinger

Jessi Henderson (Lab Assistant) jessilyn@uoregon.edu

Lectures: Mon., (one Wed.*) & Fri. 12:00 - 12:50. 116 Esslinger (*week 9).

Plant Walks: Wednesdays 12:00-12:50. **Weeks 1, 2, 3, 5, 6, 7 & 8** we will meet in Alton Baker Park.

Week 4 we will meet at the Urban Farm.

Laboratory: Mon. & Weds. 14:00 - 16:50. 116 Esslinger.

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

Course Format

This is an intensive, 5-credit, upper level, lab/field course that meets for ~11 hours per week. Your attendance and active participation is critical to your success. We will have lectures every Monday and Wednesday (the Wednesday lectures will be during the 'lecture' time half of the weeks, and during the first part of lab the other half – see schedule for details) that cover plant anatomy and identification. We will then apply this information in lab on Monday and Wednesday afternoons. You are expected to do the assigned readings ahead of time so that you are well prepared for our time in the lab. Friday lectures are typically focused on various aspects of plant ecology and evolution. Field trips and plant walks will help contextualize the course content, and allow for practicing identification skills under real-world conditions.

Course Materials

REQUIRED BOOKS

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

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

REQUIRED LAB/FIELD SUPPLIES:

10X hand lens, probe (unfolder paper clip can work), forceps (tweezers), razor blade (or x-acto type knife), metric ruler (15 cm is fine). Drawing paper and pencils/pens. Ziploc bags (1qt.&1gal.) for keeping things dry and collecting samples. A Rite-in-the-Rain (or other water-proof) notebook and pencils (pen is not water resistant!). Rain gear. A camera (phone ok).

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. Lone Pine Publishing, Auburn, WA.

Elpel T.J. Any edition. Botany in a day. HOPS Press, Pony MT.

Course Assessments

Assessment	#	Pts. Each	Total
Final Exam	1	200	200
Midterm Exam	1	100	100
Labs	(18-1) = 17	10	170
Practicals	(7-1) = 6	30	180
Final Practical	1	125	125
Field Trips	2	25	50
Daily Reading Quizzes (DRQs)	23	3	69
Lecture Quizzes (LQs)	22	3	66
Discussion Posts	4	5	20
iNaturalist Observations	20	1	20
		TOTAL	1000

EXAMS

Exam 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. Questions may be multiple choice, short essay, fill in the blank, or true/false format. Barring unforeseen circumstances, exams will be in-person.

LABS

Labs will be mostly spent making observations of, and identifying live specimens. We will also display dried specimens as well as products produced from the plant families that we are studying. Three lab sessions (see schedule) we will be out of the lab for extended field trips that will return to campus at 18:00. You will typically turn in a worksheet at the end of each session that is worth 1% of your final grade. Participating in lab will be crucial to your success on the practical quizzes and exams. To accommodate any public health related absences, we will drop your lowest lab score.

PRACTICALS

There will be seven practical lab quizzes, and a final. The practicals will focus on plant morphology, family recognition, species ID, and keying, points will be deducted for misspelling. To accommodate any public health related absences, we will drop your lowest lab score. The final practical will be in lab during week ten and cannot be made up.

FIELD TRIPS

Field trips are an important part of this course. There is no substitute for seeing plants growing in their natural habitats. Three of our trips will be an extension of our regular lab time. If you have a conflict with returning to campus at 18:00 instead of ending lab at 17:00 please notify me as soon as possible. We will travel by van and will meet in front of McArthur Court on University st.* ~5-10 minutes before our scheduled departure. Please be prompt as we will leave on time with or without you.

Dates

Wednesday April 6 (Mt. Pisgah) from 14:00-18:00

Saturday April 23 (Coast) from 8:00-18:00

Monday May 2 (Amazon Park*) from 14:00-18:00

*May 2 meet in parking lot at corner of Amazon Parkway and E. 24th ave. See Canvas for directions.

Saturday May 7 (Cascade Transect) from 8:00-19:00

Wednesday May 25 (Horse Rock Ridge) from 14:00-18:00

Field Trip Packing List

Snacks (and lunch for the two Saturday trips)

Water

Field notebook (& pencil)

Flora of the PNW, (hand-lens, ruler etc.)

Field guides (optional)

Wear long pants.

Hiking boots, rubber boots, or tennis shoes (NO SANDALS).

Bring a hat and sunscreen, as well as **rain gear**.

Dress in layers, the day may start out cool and then warm up, or vice versa.

DAILY READING AND LECTURE QUIZZES

There will be two types of quizzes administered on Canvas. Daily Reading Quizzes (DRQs) are meant to be completed **before** class to prepare you for the days material. Lecture Quizzes (LQs) are meant to be

completed **after** class to probe your understanding and retention of the material. Both quiz types are open book and untimed. The DRQs will be due BEFORE the relevant lecture, and the LQs will be due before the NEXT lecture. Both quizzes will be due at 11:50 every MWF.

iNATURALIST OBSERVATIONS

As a way to get you out and identifying plants on your own, you will be responsible for making and posting **twenty** observations to the iNaturalist citizen science platform. You will need to make a free account at <https://www.inaturalist.org/>, and you will need access to a digital camera (phones ok). Further details will be available in the Assignments section of Canvas.

DISCUSSION POSTS

As a way to encourage interaction outside the classroom you will be required to post to Discussion Forums at a few points during the term. Sometimes this will be relatively personal, like introductions, mid-term feedback on the course, or a final reflection. Other weeks it will be more aligned with various assignments. You will be required to respond to someone else's post for all Discussions.

Course Policies

COURSE CONTEXT (COVID-19 + everything else!)

In plant ecology one of the things that you will come to appreciate is that context matters. For example, plants will respond differently to herbivory when they are drought-stressed, or adjust nectar production based on pollinator visitation. We want to acknowledge that we are all experiencing things outside the bounds of normalcy right now and that each of us are being stressed in ways that we have not entirely anticipated nor fully appreciate. This impacts our learning communities as much as any other aspect of our lives.

We urge us all to remember that we did not sign up for this. Not for the pandemic, not for the climate chaos, not for the systemic injustice, not for the unpredictability. We will get through this 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 must remain flexible and adjust to the situation as needed. Everyone needs support and understanding in these unprecedented times.

We want you to know that we stand in firm solidarity with those that are continuing to demand social justice and an end to war. We realize that the events of the last two years are impacting each of you in unique ways, some of which may be difficult for others to understand. We want to encourage inclusivity and understanding around the unique issues faced by our black students and other students of color.

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

We intend to facilitate a learning experience that will be of value to you in a post-pandemic world. We 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 Wall Kimmerer on the COVID-19 pandemic

PROFESSIONAL CONDUCT

We will work hard to make this course valuable to your learning. We welcome suggestions from you at any time about things you think could be done to improve the course. In return, we ask that you arrive to lab and lecture on time and stay until class is over without making unnecessary noise that could distract your classmates. Please put away and do not use your own computers, cell phones, or other electronic devices during lecture or lab. We promise to respect you as students and as individuals, and ask that you return that respect to us and to your fellow classmates. Class rosters are provided to the instructor with the student's legal name. We will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter (or before) so that I may address you properly.

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](https://dos.uoregon.edu/conduct) (located at dos.uoregon.edu/conduct).

INCLUSIVENESS

Open inquiry, freedom of expression, and respect for differences 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. Our classroom is a learning environment, and as such should be a safe, inclusive and respectful place. Being respectful includes using preferred pronouns for your classmates. Disrespecting fellow students as well as combative approaches, tones and/or actions are not acceptable. Please make us aware if there are classroom dynamics that impede your (or someone else's) full engagement.

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. We will have a running Discussion forum on our Canvas site called "Question Board" for the entire group to ask and answer questions.

We will make ourselves as available as possible for questions related to course material. However, we ask that you make an honest effort to find the answers yourself, including posing questions to fellow students first (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 us until the next day. **Please include "BI 442" in the subject line of all emails.**

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 instructors, one of our responsibilities is to help create a safe learning environment for 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 aeo.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.

CRISES HAPPEN

If you are having difficulties that are interfering with your ability to do well in the class, please tell an instructor as soon as possible. We may be able to refer you to someone for help or to make special arrangements if the need is real and you have done your best to deal with the situation in a timely manner. There is a Crisis Center on campus that you should not hesitate to call if you, or a friend, are in need of assistance. Their phone number is 346-4488.

REPORTING

The instructors of this class are 'Assisting Employees.' As such, if you disclose to us, we will respond to you with respect and kindness. We will listen to you, and will be sensitive to your needs and desires. We will not judge you. We will support you. As part of that support, we will direct students who disclose prohibited discrimination and harassment, including sexual harassment or violence, to resources that can help and will only report the information shared to the university administration if the student requests that the information be reported (unless someone is in imminent risk of serious harm or a minor). *Please note the difference between 'privacy' and 'confidentiality.'* As an Assisting Employee we can offer privacy because we are not required to report certain information to the university. However, we cannot be bound by confidentiality in the same way that a counselor or attorney is. Confidential resources such as these means that information shared is protected by federal and state laws. Any information that we as assisting employees receive may still be accessed by university or court proceedings. This means, for example, that we could still be called as a witness or required to turn over any related documents or notes that we keep.

For information about our reporting obligations as an employee, please see **the [Employee Responsibilities](#)** on the Office of Investigations and Civil Rights Compliance (OICRC) website. Students experiencing sex or gender-based discrimination, harassment or violence should call the 24-7 hotline 541-346-SAFE [7244] or visit safe.uoregon.edu for help. Students experiencing all forms of prohibited discrimination or harassment may contact the Dean of Students Office at 541-346-3216 or the non-confidential Title IX Coordinator/OICRC at 541-346-3123. Additional resources are available at investigations.uoregon.edu/how-get-support.

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. They are available Monday-Friday 8am-5pm by calling (541) 346-1155 or emailing uoaec@uoregon.edu. <https://aec.uoregon.edu/>

UO ACCESS SHUTTLE

The UO Access Shuttle is an on-campus ride service provided at no cost to students with conditions that limit mobility. More information and a sign-up form can be found on the parking & transportation department website: <https://parking.uoregon.edu/content/access-shuttle>.

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. Email cmae@uoregon.edu. or call the front desk at 541-346-3479.

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.

DEAN OF STUDENTS

The Dean of Students website has additional resources targeted to specific communities on campus. Check out <https://dos.uoregon.edu/community> for information on the Black Cultural Center, LGBT+ Support Services, the Women’s Center, as well as resources for Nontraditional students and Veterans.

DUCK RIDES (FORMERLY ‘SAFE RIDES’)

Duck Rides is a student-led organization dedicated to providing free and accessible transportation to all university students, staff and faculty. The goal is to provide safe transportation that is an alternative to walking home alone at night, and to prevent sexual assault and driving under the influence. Hours of Operation: 6:00 pm – 12:00 am. 7-days-a-week. 541-346-7433. duckrides@uoregon.edu. <https://duckrides.uoregon.edu/>

Covid Protocols

We want to let you know that while for healthy, vaccinated people, the pandemic feels like it is normalizing, some of your instructional staff live with vulnerable individuals, including children too young to be vaccinated. The pandemic does not feel over to these people.

ACADEMIC DISRUPTION

In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas. *In the event that the instructor of this course has to quarantine, this course may be taught online during that time.*

STAYING SAFE IN CLASSES

As the University of Oregon continues in-person instruction, instructors and students play a key role in keeping our community healthy and safe.

- **Prevention:** To prevent or reduce the spread of COVID-19 in classrooms and on campus, all students and employees must:

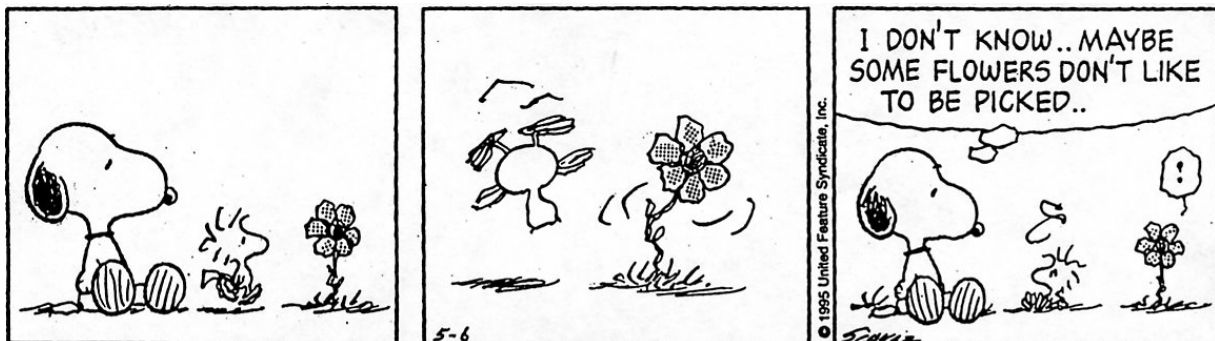
- Comply with [vaccination policy](#)
 - [Wash hands](#) frequently
 - Complete daily [self-checks](#)
 - Stay home/do not come to campus if feeling [symptomatic](#).
 - Individuals with no symptoms or mild symptoms can get tested at McArthur Court through UO's Monitoring and Assessment Program. Masks are required at COVID-19 testing sites including in line outside.
 - Visit the [Exposure Scenario](#) page if you test positive or have been in close contact with a confirmed or presumptive case.
- **Support:** The following resources are available to you as a student.
 - [University Health Services](#) or call (541) 346-2770
 - [University Counseling Center](#) or call (541) 346-3277 or (541) 346-3227 (after hrs.)
 - [MAP Covid-19 Testing](#)
 - [Corona Corps](#) or call (541) 346-2292
 - [Academic Advising](#) or call (541) 346-3211
 - [Dean of Students](#) or call (541)-346-3216

Course Schedule

Week	Date	LECTURES	LABS	Assignments	Simpson 3rd Ed	Simpson 2nd Ed	Additional Readings
1	3/28	Introduction to Systematic Botany	Floral Diversity	DRQ 1; Discussion 1	3-16; 469-472; 167-180; 490-511; 691-700.	3-16; 451-454; 163-176; 468-489; 669-678	APG III 2009 Intro; APG IV 2016 Intro & Review;
1	3/30	Plant Walk: Alton Baker	Vegetative Diversity / Dichotomous Keys	DRQ 2; LQ 1	483-490; 518-530; 625-630	461-468; 496-507; 605-610	Hitchcock 2018 xix-xxx; Flora PNW Errata; Harrington 1985
1	4/1	Taxonomy		DRQ 3; LQ 2	17-18; 631-646	611-626	
2	4/4	Origins of Angiosperms	Fruit Diversity (PRACTICAL 1)	DRQ 4; LQ 3	180-183	176-178	Pennisi 2009, Sun et al 1998
2	4/6	Plant Walk: Alton Baker	Mount Pisgah Field Trip	DRQ 5; LQ 4			Henderson 2014
2	4/8	Magnoliids: Nymphaeaceae, Laurales, Magnoliales, Piperales		DRQ 6; LQ 5	187-191; 193-195; 196-206	181-185; 187; 189-197	

3	4/11	Monocots I: Araceae, Liliales, Asparagales	Magnoliids (PRACTICAL 2)	DRQ 7; LQ 6	206-210; 213-215; 218-236	200-202; 204-208; 213-230	Keltch 2002
3	4/13	Plant Walk: Alton Baker	Monocots I	LQ 7			
3	4/15	Selection on Flowers		DRQ 8			Ollerton 2017
4	4/18	Eudicots: Ranunculales, Saxifragales	Eudicots (PRACTICAL 3)	DRQ 9; LQ 8; Discussion 2	285-292; 297-303	275-281, 287-292	
4	4/20	Plant Walk: Urban Farm	Rosids I Fabids I: Malpighiales, Fabales	DRQ 10; LQ 9	305; 307- 317; 319- 323	312-313; 315-319; 322- 326; 328-330	
4	4/22	Selection on Fruit		DRQ 11; LQ 10	515; 602	493; 580	
4	4/23	FIELD TRIP	COAST				
5	4/25	Rosids II Fabids II: Rosales, Cucurbitales, Fagales	Rosids II Fabids II (PRACTICAL 4)	DRQ 12; LQ 11	325-328; 333; 335- 339	331; 334- 335; 339- 347	
5	4/27	Plant Walk: Alton Baker	Rosids III Malvids	DRQ 13; LQ 12	341-343; 350-353; 359-362	347-350; 357-360; 366-371	
5	4/29	Selection on Leaves		DRQ 14; LQ 13			Dunn 2012
6	5/2	MIDTERM	Amazon Park Field Trip	Discussion 3			Kaye 1992
6	5/4	Plant Walk: Alton Baker	Superasterids: Caryophyllales (Amaranthaceae, Chenopodiaceae, Cactaceae, Caryophyllaceae, Polygonaceae)	DRQ 14; LQ 13	365; 367- 383	295-312	
6	5/6	Species and Speciation		DRQ 15; LQ 14	602-604; 671-684	580-582 & 649- 662	
6	5/7	FIELD TRIP	CASCADES				
7	5/9	Asterids I: Cornaceae, Ericaceae	Asterids I (PRACTICAL 5)	DRQ 16; LQ 15	384-386; 389-391	372-374; 378-380	
7	5/11	Plant Walk: Alton Baker	Asterids II: Lamiids: Boraginales, Lamiales, Solanales	DRQ 17; LQ 16	400-406; 412; 416- 425; 428- 429	389-394; 400; 402- 416	Olmstead 2002
7	5/13	NO CLASS	INATURALIST FLORABUTZ	LQ 17			
7		Extra-credit opportunity	WILDFLOWER FESTIVAL SETUP				

8	5/16	Asterids III: Campanulids: Apiales, Dipsacales	Asterids III: Campanulids (PRACTICAL 6)	DRQ 18	431-439	419-426	
8	5/18	Plant Walk: Alton Baker	Asteraceae	DRQ 19; LQ 18	440-445	427-433	
8	5/20	Phylogenetics		DRQ 20; LQ 19	18-47; 607-616; 619; 703- 710	17-48; 585-592; 681-689	
9	5/23	Commelinids	Commelinids (PRACTICAL 7)	DRQ 21; LQ 20; Discussion 4	237-267	230-260	
9	5/25	Ethnobotany	Horserock Ridge Field Trip	DRQ 22; LQ 21			Prance 1991; Idu 2009; Goldenber g 2004
9	5/27	Plant Conservation		DRQ 23; LQ 22	684-687	662-665	Antonelli 2020 pp.10-17.
1 0	5/30	NO CLASS	MEMORIAL DAY				
1 0	6/1	NO CLASS	FINAL PRACTICAL				
1 0	6/3	Final Review		iNaturalist Observations			
	6/8	FINAL EXAM 10:15					



“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*