

BI 442/542 Systematic Botany

¡Spring 2020 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)

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Zoom office hours: Friday 12:00-12:50 & 15:00-15:50; or by appointment.

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Zoom office hours: Mon. 14:00-14:50; Tues. 11:00-11:50; Thurs. 11:00-11:50 & 14:00-14:50

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Zoom office hours: Mon. 12:00-12:50pm; Wed. 12:00-12:50 & 14:00-14:50pm

Lectures Posted: No later than 12:00 on Monday, Wednesday & Friday

Laboratory Activities Posted: No later than 14:00 on Monday & Wednesday

'Live' Sessions on Zoom: Monday & Wednesday 15:00pm-16:50pm

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

Notes on this 2020 COVID-19 Remote Edition

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 though. I once taught a version of this class during winter term at PSU, up in Portland, and considered it a lofty botanical challenge. I am doing my best to approach this situation with the same good humor and positive attitude (I did succeed at that provocation)!

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 will be difficult to emulate. I do bring it up for at least three reasons though. 1) to give you a glimpse into what I am 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 in significant time to succeed. 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 class, in order to succeed and thrive. I guess, 4) is to just also say how heartbroken I am not to get to share this glorious spring being outside in Oregon with you all! – but we have what we have, and I aim to push each of you to make this not only a substitute for something imagined, but an incredible experience in its own right that we will all remember for a lifetime.

I urge us all to remember that we did not sign up for this. Not for the sickness, not for the quarantine, not for teaching remotely, not for taking an online class. We will get through this though, by prioritizing each other as human beings, prioritizing simple solutions that work for the most people, by sharing resources and communicating clearly. We need to acknowledge that this will not be the same class. Some activities and assignments are no longer possible, some expectations are no longer reasonable. We will foster intellectual nourishment, social connection, and personal accommodation, by asynchronous content for diverse access and contexts, as well as synchronous opportunities for those that can attend. We will remain flexible and adjust to the situation as needed. Nobody knows what the future holds and we may need to acclimate. Everyone needs support and understanding in this unprecedented moment (*modified from Bayne 2020*).

I fully intend to facilitate a learning experience that will be of value to you in a post-pandemic world, whether you become a botanist or a field biologist, or not. I truly believe that the awareness and the skills that we will develop together 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

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:

10X hand lens, probe and/or forceps, razor blade, metric ruler, drawing paper and pencils/pens, ziploc bags (1qt.&1gal.) for keeping things dry and collecting samples, a Rite-in-the-Rain notebook and pencils (pen is not water resistant!).

Required Technology

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](#). The UO's Information Services has 150 Chromebooks available to lower-income students as loaner devices for those who need a computer to continue their education remotely. [To sign up for a loaner Chromebook, click here](#). They will be available on a first-come, first-serve basis.

Access to Canvas <https://canvas.uoregon.edu/>. 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](tel:541-346-4357) ; livehelp.uoregon.edu

An iNaturalist account <https://www.inaturalist.org/>. (and a camera). You will be responsible for contributing 20 observations to our course project.

A camera or a scanner to submit lab drawings and field book sketches.

Recommended Technology

The ability to attend [Zoom](#) meetings. We will have two live Zoom sessions each week as well as nine zoom office hours each week. It will be very useful to you to learn how to navigate this technology. Additional tutorial resources will be posted to Canvas.

Optional (but recommended) 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.

Course Format

Given that reality as we know it has become a bit of a moving target, I have opted for a hybrid approach to facilitating this course.

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 ~3 lectures a week in some sort of screen-cast/voice-over fashion. You will be tasked with completing assignments and lab activities on your own. However, you will have ~9 hours per week of Zoom access to one-on-one help with a member of the instructional staff. I will also offer 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!

Assignments & Assessments*

| Assessment | # | Due | % Each | Total |
|------------------------------|----|------------------|--------------|------------|
| Pre-course Survey | 1 | 3/30 at Midnight | 1 | 1 |
| DRQs | 26 | Midnight MWFs | 0.5 | 12 |
| Discussion Posts | 8 | Midnight MWFs | 1 | 8 |
| Labs | 16 | Midnight TRs | 1 | 16 |
| Field Journals | 8 | Midnight Sundays | 1 | 8 |
| Practical Quizzes | 9 | Midnight Sundays | 1 | 9 |
| Midterm Exam | 1 | 4/27 by 13:50 | 10 | 10 |
| Domestic Botanical Inventory | 1 | 5/17 at Midnight | 5 | 5 |
| Final Practical | 1 | 6/3 at 18:20 | 10 | 10 |
| iNaturalist 'Collections' | 1 | 6/7 at Midnight | 10 | 10 |
| Final reflection | 1 | 6/7 at Midnight | 1 | 1 |
| Final Exam | 1 | 6/8 at 14:15 | 10 | 10 |
| | | | 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.

Pre-course Survey

This short survey is designed for me to get to know a little bit about any special opportunities or potential challenges or that your unique situation may present during this course.

DRQs

Daily Reading Quizzes 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.

Discussion Posts

You will be required to post to a course-wide discussion board at eight 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.

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. I will always post them BEFORE our regularly scheduled lab meetings and you will have until the next night to submit your work.

Field Journals

Each week you will be 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 for weekly checks. 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.

Midterm Exam

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. **Both the midterm and the final are expected to be taken close to the scheduled time. Please put the dates and times on your calendars.** The midterm will be available from 11:00-13:50 and you will have 50 minutes to complete it. You are expected to do your own work.

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.

Final Practical

This will be very similar to the weekly practical quizzes (see above). It will be available over our regular lab time 12:30-18:20 on June 3rd. You will have three hours to complete it.

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.

Final Reflection

This will be a short reflective essay on your experience in this course. You will be graded on thoughtfulness and completion, not content.

Final Exam

See description of the Midterm Exam above. The Final Exam will be available on Canvas from 8:15-14:15 on June 8. You will have two hours to take it.

SCHEDULE

| Week | Date | Topic | Simpson 3 rd | Simpson 2 nd | Other Readings | Assignments |
|------|------|------------------------------------|----------------------------|----------------------------|---|-------------------------------------|
| 1 | 3/30 | Introduction to Systematic Botany | 3-16; 469-472 | 3-16; 451-454 | APG III 2009; APG IV 2016 | Discussion Post1; Pre-course Survey |
| 1 | 3/30 | Lab 1: Floral Diversity | 167-180; 490-511; 691-700 | 163-176; 468-489; 669-678 | | Lab1; DRQ1 |
| 1 | 4/1 | Taxonomy | 17-18; 631-646 | 611-626 | | DRQ2 |
| 1 | 4/1 | Lab 2: Vegetative Diversity | 483-490; 518-530 | 461-468; 496-507 | | Lab2; DRQ3 |
| 1 | 4/3 | Using a dichotomous key | 625-630 | 605-610 | Hitchcock xix-xxx; FloraPNW_Errata; Harrington 1985 | Quiz1; Discussion Post2; DRQ4 |
| 2 | 4/6 | Origins of Angiosperms | 180-183 | 176-178 | Pennisi 2009, Sun et al 1998 | DRQ5 |
| 2 | 4/6 | Lab 3: Fruit Diversity | 511-514 | 489-492 | | Lab3; DRQ6 |
| 2 | 4/8 | Field Methods | 649-654 | 629-634 | MOBOT Field | DRQ7 |

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| | | | | | Manual | |
| 2 | 4/8 | Lab 4: Using a dichotomous key | | | | Lab4 |
| 2 | 4/10 | Selection on Flowers | 595-602 | 573-580 | Ollerton 2017 | Quiz2; Field Journal1; DRQ8 |
| 3 | 4/13 | Magnoliids: Nymphaeaceae, Laurales, Magnoliales, Piperales | 187-191; 193-195; 196-206 | 181-185; 187; 189- 197 | | DRQ9 |
| 3 | 4/13 | Lab 5: Magnoliids | | | | Lab5 |
| 3 | 4/15 | Monocots I: Araceae, Liliales, Asparagales | 206-210; 213-215; 218-236 | 200-202; 204-208; 213-230 | Keltch 2002 | DRQ10 |
| 3 | 4/15 | Lab 6: Monocots I | | | | Lab6 |
| 3 | 4/17 | Selection on Leaves | | | Dunn 2012 | Quiz3; Field Journal2; DRQ11 |
| 4 | 4/20 | Eudicots: Ranunculales, Saxifragales | 285-292; 297-303 | 275-281, 287-292 | | DRQ12 |
| 4 | 4/20 | Lab 7: Eudicots | | | | Lab7 |
| 4 | 4/22 | Rosids I Fabids: Malpighiales, Fabales | 305; 307- 317; 319- 323 | 312-313; 315-319; 322-326; 328-330 | | DRQ13 |
| 4 | 4/22 | Lab 8: Rosids I Fabids | | | | Lab8 |
| 4 | 4/24 | Selection on Fruits | 515; 602 | 493; 580 | | Quiz4; Field Journal3; DRQ14 |
| 5 | 4/27 | MIDTERM EXAM | | | | |
| 5 | 4/27 | Plant Walk | | | | Discussion Post3 |
| 5 | 4/29 | Rosids I Fabids: Rosales, Cucurbitales, Fagales | 325-328; 333; 335- 339 | 331; 334- 335; 339- 347 | | DRQ15 |
| 5 | 4/29 | Lab 9: Rosids I: Fabids con'd | | | | Lab9 |
| 5 | 5/1 | Species and Speciation | 602-604; 671-684 | 580-582 & 649-662 | TBA | Quiz5; Field Journal4; DRQ16 |
| 6 | 5/4 | Rosids II Malvids: Geraniales, Brassicales, Sapindales | 341-343; 350-353; 359-362 | 347-350; 357-360; 366-371 | | DRQ17 |
| 6 | 5/4 | Lab 10: Rosids II: Malvids | | | | Lab10 |
| 6 | 5/6 | Superasterids: Caryophyllales (Amaranthaceae, Chenopodiaceae, Cactaceae, Caryophyllaceae, | 365; 367- 383 | 295-312 | | DRQ18 |

| | | | | | | |
|--------------|------------|---|---|-------------------------------|--------------------------|--|
| | | Polygonaceae) | | | | |
| 6 | 5/6 | Lab 11: Caryophyllales | | | | Lab11 |
| 6 | 5/8 | Phylogenetics | 18-47; 607-616; 619; 703- 710 | 17-48; 585-592; 681-689 | | Quiz6; Field Journal5; DRQ19 |
| 7 | 5/11 | Asterids: Cornaceae, Ericaceae | 384-386; 389-391 | 372-374; 378-380 | | DRQ20 |
| 7 | 5/11 | Lab 12: Asterids | | | | Lab12 |
| 7 | 5/13 | Asterids II Lamiids: Boraginales, Lamiales, Solanales | 400-406; 412; 416- 425; 428- 429 | 389-394; 400; 402- 416 | | DRQ21 |
| 7 | 5/13 | Lab 13: Asterids II: Lamiids | | | | Lab13 |
| 7 | 5/15 | Plants and Society | | | TBA | Quiz7; Field Journal6; Discussion Post4; Domestic Botanical Inventory |
| 8 | 5/18 | Asterids III Campanulids: Apiales, Dipsacales | 431-439 | 419-426 | | DRQ22 |
| 8 | 5/18 | Lab 14: Asterids III: Campanulids | | | | Lab14 |
| 8 | 5/20 | Asteraceae | 440-445 | 427-433 | | DRQ23 |
| 8 | 5/20 | Lab 15: Asteraceae | | | | Lab15 |
| 8 | 5/22 | Ethnobotany | | | Prance 1991; Idu 2009 | Quiz8; Field Journal7; Discussion Post5; DRQ24 |
| 9 | 5/25 | MEMORIAL DAY | NO SCHOOL | | | |
| 9 | 5/27 | Commelinids | 237-267 | 230-260 | | DRQ25 |
| 9 | 5/27 | Lab 16: Commelinids | | | | Lab16 |
| 9 | 5/29 | Conservation | 684-687 | 662-665 | | Quiz9; Field Journal8; DRQ26; Discussion Post6 |
| 10 | 6/1 | FAMILY REVIEW | | | | Discussion Post7 |
| 10 | 6/1 | Plant Walk | | | | Discussion Post8 |
| 10 | 6/3 | FINAL PRACTICAL | | | | |
| 10 | 6/5 | PLANT FAMILY POTLUCK Grand prize for the dish with most families. | | | | iNaturalist 'Collection'; Discussion Post8; Final reflection |
| FINAL | 6/8 | FINAL EXAM 10:15 | | | | |

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—more information coming soon.

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 spring 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/>.

As an essential student service, the University Counseling Center will remain open during spring term for in-person appointments and drop-in therapy. Up-to-date hours are published below.

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.

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 (ideas, quotations, paraphrases). 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 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 called "Question Board" for the entire group to ask and answer.

I will try to make myself as available as possible for questions related to course material. However, I ask that you pose questions to fellow students first, you can do this through Canvas using either the Discussion or Chat function. 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 "BI 442 (BI 542)" in the subject line of all emails.***

I will host "live" office hours through Zoom each week, and I welcome meetings outside my regular office hours, too, knowing that there is considerable uncertainty in all of our lives right now. Just email me or call me to set a time. If you experience Internet access challenges, my phone is a good way to reach me.

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.

"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*