EFB 437/637 – Plant Propagation Spring 2023

Instructor:

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Student Hours:

I set this time aside every week for you to stop by and chat about anything that might be on your mind - class-related or otherwise. I only ask that you make an appointment during the hours below if possible.

Mondays and Wednesdays – 1:00 - 3:00 pm
Tuesdays and Thursdays – 9:00 a.m. to 3:00 p.m.

Class Days, Times and Rooms:

Lectures:
Monday and Wednesday mornings, 9:30 – 10:25, Room 12, Illick Hall
Labs:
Friday afternoons, 12:45 – 3:35, Room 530, Illick Hall (greenhouse workroom)

Learning Outcomes:

Upon completion of this course, it's my hope that you will have developed the knowledge, skills, and confidence to help others learn how to propagate a wide range of plants. In other words, my over-arching goal for you is that by the end of the semester you will possess the knowledge and skills needed to ***teach*** plant propagation (versus simply passing the class)! To teach well, you must:

- Understand and use with confidence terminology associated with the propagation and production of plants. For example, I will not ask you to select the correct definition of propagation concepts from among four options on a multiple-choice exam. Rather, I will expect you to demonstrate your understanding and application of concepts when preparing instructions for others on how to propagate plants that when posed as assessment questions.

- Locate, analyze and assess classic and recent literature associated directly (and indirectly) with the propagation of plants, and directly communicate with authors to discuss unpublished experimental methods, techniques – and especially pitfalls to avoid. For example, while the Internet is awash with websites offering tips for propagating countless plant species they often lack any reference to primary research that supports their recommendations. Therefore, I will expect you to support your work with references from high quality journals, textbooks and direct communications with topic experts.

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- Communicate effectively (clearly, concisely and compellingly) both orally and in writing on all assessments throughout the semester. Every assessment is an opportunity to hone your communication skills and every effort should be something you're proud of and excited to share with others in support of their propagation efforts. Not to brag, but I'm living proof that people will pay you for your communication skills!

- Demonstrate both analytical and physical proficiency in basic propagation techniques (e.g., seed germination, stem, leaf and root cuttings, budding and grafting, layering, division, etc.).

- Demonstrate proficiency in the problem-solving, technical, and presentation skills required to design, conduct, evaluate and explain an experiment leading to the successful (or not) sexual and/or asexual propagation of a specific plant species.

- Analyze conditions associated with a failing propagation scenario (e.g., seed source, stock plant condition, propagation environment, propagation medium, time of year, etc.), and propose alternative strategies for future efforts.

Note: Outcomes for graduate students enrolled in EFB 637 are:

- Develop enhanced content expertise relating to at least one propagation technique (ideally associated with her/his thesis or dissertation, though not required).

- Use content expertise to create and evaluate content for a one period “lecture” to be delivered to advanced undergraduates in a “flipped” class format.

- Use content expertise to develop and deliver a team-based problem-solving exercise to advanced undergraduates that will reinforce and build upon “lecture” content developed above.

- Use enhanced expertise to develop and deliver a laboratory exercise to advanced undergraduates that will reinforce and build upon the “lecture” and problem-solving exercise efforts above.

Required Textbook:

Currently in its ninth edition (I used the third edition when I took "Plant Propagation" at Southern Illinois University in 1980), the assigned textbook is a classic and used in almost every plant propagation-related course in North America! You'll find one copy of the ninth edition, one copy of the eighth edition and three copies of the seventh edition on reserve at the Moon Library reference desk.

If, however, you're in the process of developing a professional reference library, I strongly encourage you to purchase a copy - if for no other reason than the last three chapters offer specific recommendations for propagating many hundreds of plant species. (And, yes, I do know that it's ridiculously expensive to purchase.)

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Hartmann & Kester's Plant Propagation: Principles and Practices
F.T. Davies, R.L. Geneve and S.B. Wilson
Ninth Edition
ISBN-10: 978-0-13-448089-3
ISBN-13: 978-0-13-448089-3
Pearson Education, Inc., 2018

Additional References:

Plant Propagation: Concepts and Laboratory Exercises
Beyl, C.A. and R. N. Trigiano, eds.
ISBN-10: 1-4200-6508-4
CRC Press, 2008

Making More Plants: The Science, Art, and Joy of Propagation
Kenneth Druse
ISBN-10: 0-517-70787-X
Clarkson Potter, 2000

American Horticultural Society Plant Propagation: The Fully Illustrated Plant-by-Plant Manual of Practical Techniques
Alan Toogood, ed.
ISBN-13: 978-0789441164
Dorling Kindersley, 1999

The Reference Manual of Woody Plant Propagation, From Seed to Tissue Culture
Michael A. Dirr & Charles W. Heuser, Jr.
Second Edition
ISBN-10: 0942375-092
Varsity Press, 2006

Online Journal Resources:

I'll introduce you to most of these resources during the first week of class. My experience, however, has been that most students forget they exist within the first couple of weeks of the semester. This is unfortunate as they can be very helpful as you're working on your course capstone project.

Therefore, as a reminder of their existence, don't be surprised if there are occasional assessment questions based on articles found in these resources!

"International Plant Propagator's Society"
Just as it sounds, this nearly seventy-five year-old professional organization and its international membership focuses specifically on the propagation of economically important plants (agricultural, ornamental, silvicultural, etc.). Student membership in this organization is free and provides you with unlimited access to the organization's online Annual Proceedings.

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"American Society for Horticultural Science"

The American Society for Horticultural Science (ASHS) publishes three excellent journals; HortTechnology (focuses on communication of the "practical application/adaptation" of horticultural crop production/management/education research), HortScience (focuses on the communication of "applied research" results), and the Journal of the American Society for Horticultural Science (focuses of the communication of basic research results principally to other researchers).

"Journal of Environmental Horticulture"

Similar to the ASHS HortTechnology journal, this quarterly Horticulture Research Institute publication typically focuses on the communication of the application of research to real-world problems. The results of several SUNY ESF American Chestnut Research and Restoration Project research projects have been published in this journal in recent years.

"Southern Nursery Association Research Conference Proceedings"

Originally formed by a group of nursery owners in Tennessee and Georgia in 1899 to address unfavorable rail shipping rates to northern and midwestern markets as well as non-uniform nursery stock inspection practices from one state to another, this organization has grown to be a major supporter of nursery and greenhouse production and marketing research. Its annual Research Proceedings can be an excellent source of information on the propagation of a wide range of trees, shrubs and perennials.

"Propagation of Ornamental Plants"

Published four times per year, this journal is truly international in scope. Most articles focus on aseptic/tissue culture propagation research. However, research on the propagation of a wide range of plants using other propagation techniques can also be found in this journal.

"Native Plant Network"

A component of the National Center for Reforestation, Nurseries, and Genetic Resources, the mission of the Native Plant Network is to "provide technical and practical information on the growing and planting of North American native plant species for restoration, conservation, reforestation, landscaping, roadsides, etc." The two principal resources offered by the NPN is the Native Plants Journal and the online Propagation Protocol Database that as of January 2022 features more than 3,000 protocols for propagating native plants!

Supplies Needed:

10X hand lens, small (***sharp***) pocketknife, hand pruners (desirable)

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E-mail:

I anticipate delivering lecture outlines, website links, etc., to your 'syr.edu' address. Because server space for this address is limited, go to:

https://answers.syr.edu/display/ITHELP/Enable+Forwarding+in+SUMail

to redirect your email to your @hotmail.com, @gmail.com, @Yahoo.com, etc. address.

Attendance:

There is no attendance requirement/expectation for this course. We're all adults here and you're paying for the opportunity to take this class, so I respect that you're going to do whatever works best for you on any given day.

That said, most of our Monday and Wednesday class sessions are devoted to group-based, problem-solving exercises not me-talking-at-you lectures. Therefore, if you're not in class, you're going to miss the opportunity to reinforce your learning by participating in these exercises and your classmates learning may suffer without your enthusiastic input.

Ultimately, my hope is that you're going to find the class to be one of the most interesting and useful you'll take during your time here at SUNY ESF and will look forward to coming to every session.

Grading:

We've all been programmed throughout our school years to focus on the importance of good grades. Also, and in my opinion unfortunately, high GPAs are critically important to receiving many/most scholarships. Yet, despite this lazer-like, anxiety-inducing focus, learning science research over many decades has repeatedly shown that "good" grades are not a reliable indicator of good/deep learning - which is the whole idea of college, right?

Bottom line, I HATE the concept of "grades!" I would much rather you fail this class (don't freak out, it's not likely) but LEARN a lot, versus receive an "A" by being good at "playing the game" (i.e, cramming for quizzes, exams, etc.) - though actually learning very little over the course of the semester!

Therefore, I hope that you'll keep the following "Six C's" in mind as you make your way through this course - and the remainder of your undergraduate education and beyond.

Confidence - Over the course of the semester, you're going to be constantly buffeted from all directions - classes, work, relationships, family issues, etc. I encourage you to consider this class as undertaking a large-scale, long-term project. At times you're going to encounter obstacles that require you to dig deep and be resilient. Developing "grit" and "determination" now will give you the confidence you will need to succeed in the future.

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Content - Believe it or not, you may very likely become "the" SUNY ESF expert on one or more of the topics we address in this course. Instead of resisting this curiosity, be passionate about it!

Creativity - Gluing content together in ways that have never been imagined - often not intentionally, but sometimes with confidence, is the "holy grail" of this trait. Unfortunately, the blinders of getting a good "grade" more often than not squash creativity like a bug! I encourage you to create and share in this class.

Critical Thinking - Our understanding of how the natural world works, as well as our understanding of how little we know about how the natural world works means that the knowledge base for propagating plants is truly like putting together a giant jigsaw puzzle that's being constantly broken apart every time you look away! Your challenge will be constantly sift through the shifting sands of propagation knowledge (content) to determine what information you'll use (confidence) to solve (creativity) your current propagation dilemma.

Collaboration - The idea of a lone wolf coming up with the "next big thing" (Amazon, Tesla, Facebook, etc.) just doesn't happen. Jeff Bezos, Elon Musk, Mark Zuckerberg, et. al., all collaborated with (many) others as their ideas were taking shape. While it may be easier to "just get it done" when it comes to group projects in this class, practicing your ability to focus the confidence, content expertise, creativity and critical thinking skills of your classmates to solve problems collaboratively will almost always lead to better results.

Communication - Have you ever thought about using your social media accounts to document your educational experiences (confidence, content expertise, creativity, critical thinking, collaborative skills) to show potential employers how you can help them effectively communicate their message? Have you ever used presentation software other than PowerPoint? Have you ever turned a PowerPoint presentation into a video that you've then embedded in your website (you do have a personal website, right)? I encourage you to take risks when communicating your learning experiences in this class. Even if it "bombs" spectacularly, as long as you've made an honest effort, you won't be penalized.

To tie these "Six C's" together, I strongly encourage you to watch New York Times columnist, Thomas Friedman's Education and Average is Over presentation.

Alright, now that I've made the point that I'm not a fan of traditional grades I want to point out that there's been a lot written on the process of grading and the weak correlation of grades to actual learning over the past twenty years. If pressed to identify a specific inspiration for my move toward student self-assessment it would most likely be a 2017 blog post by Dr. Jesse Stommel, *"Why I Don't Grade"* and his 2018 post *"How to Ungrade"*. His thoughts on "ungrading" are also found in the book *"Ungrading - Why Rating Students Undermines Learning (and What to Do Instead)."*

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What, wait a minute, why would blog posts about not grading be inspirational? Well, while I don't believe traditional grading practices provide a legitimate measure of real learning, I do realize that focusing on grades is a hard habit to break. Therefore, I want to assure you that if you actively engage in all components of the class, it should be pretty easy to get a pretty good grade - especially because you'll be grading/assessing most of your work YOURSELF! (I prefer the term "assessing" as the focus is on supporting learning versus attempting to measure learning.)

Let me say that again, you will be grading/assessing your own work.

So how is this going to work?

Quizzes (20 x 10 = 200 points):

The twenty quizzes you'll take over the course of the semester aren't meant to be annoying or punitive. Rather, mastering any skill involves repetition – whether it's playing a musical instrument, shooting free throws, baking pies, learning the art and science of propagating plants, etc.

Therefore, these frequent low-stakes quizzes are intended to support your continuous review and reflection upon the concepts presented throughout the semester - versus cramming the day before two or three exams over the course of a semester as is the case in some classes. Frequently gluing and layering information together in different ways throughout the semester will reinforce a deeper understanding of the foundational knowledge and skills needed to successfully propagate a wide range of plants. In fact, taking frequent low-stakes assessments such as these quizzes has been shown to improve learning, not just measure it and is referred to as the "testing effect."

The quizzes are cumulative (i.e., questions on the quizzes may be from any lecture, lab, field trip, supplemental reading, etc.) and are typically short - three to six or seven sentences - essays.

I will email you a copy of each quiz by noon on most Mondays and Wednesdays. You will then have until midnight to email a copy of your completed quiz to me. You'll then have until midnight on Fridays to email me your self-grading effort for Monday quizzes and until midnight on Sundays to email me your self-grading effort for Friday quizzes. I will prepare and post short rubrics that will aid you in your grading effort.

Oh, by the way, all quizzes and exams are completely open resource. You can even work on them with your classmates if you find that to be helpful to your learning/mastery of the topics we're studying!

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Lab Assignments: (2 x 50 = 100 points)

The intent of lab exercises is to provide you with:

- An introduction to the physical practices associated with the art and science (taking a leaf bud cutting, performing a “whip and tongue” graft, etc.)

- Opportunities to practice the recording of observations and measurements associated with the response of plants during the propagation process that will help you troubleshoot failures and improve the results of future efforts

- Opportunities to practice communicating the practices, observations and measurements associated with the propagation of a variety of plants.

You will submit two, fifty point individual/small group assignments during the semester. You will grade your effort using a rubric we will co-create at the beginning of our first lab session on Friday, January 20th. Instead of viewing them as "busy work" (like I did as an undergraduate), I encourage you to consider them as opportunities to practice communicating effectively via written documents, oral presentations and/or the creation of digital media content. Done well, these efforts can certainly be valid components of an *"e-Portfolio."*

~~Exams~~ Assessments (3 x 100 = 300 points):

There will be three of these critters over the course of the semester. Their intent is two-fold; to encourage the repetition required to make the knowledge and skills associated with propagating a wide range of plants second-nature to you, and to develop your critical thinking and communication skills - not to stress you out!

While each assessment will focus primarily on material covered since the preceding assessment, they will be cumulative. Like the quizzes, the questions will generally be short answer/essay. However, any given exam could theoretically consist entirely of true/false questions, multiple choice questions, or even a single, multiple part question to be answered in essay form.

As with quizzes, each of the assessments is completely open resource and you'll have until midnight to email your completed effort to me. You will then have up to a week to review and grade your assessment prior to meeting with me to discuss your effort and agree upon an appropriate grade.

I strongly encourage you to view each of these assessments as nothing more than another way of reinforcing your understanding and application of what we're discussing in this class. Hopefully, with this mindset, you might even find them to be enjoyable experiences (a number of students have actually said to me over the past several years)!

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Course Capstone Project (300 points):

This three-part project will provide you with an opportunity to explore a plant propagation-related topic in-depth - e.g., influence of environmental factors on seed germination, vegetable grafting, influence of rooting compounds on stem cuttings, etc. This may very well turn you into *the* SUNY ESF expert on the topic.

The first part of this project will be to write a manuscript suitable for submission to a popular gardening magazine such as *"Fine Gardening."* I realize that writing may not easy or enjoyable for you, but it is an invaluable and marketable skill that you should continue to hone throughout your career.

The second part of this project will be to create a short (roughly five minute) instructional video that will support and expand upon a roughly twelve-minute lesson you and a partner will prepare and deliver (i.e., teach) to the ESF community during the last week of the semester.

We will discuss this effort in much detail during the February 11th lab session at the end of the third week of the semester and I will continue to add more guidance and resources as appropriate to the Course Capstone Project page on this website.

Graduate Student Project (400 points):

If you've served as a teaching assistant, chances are that you've "taught" the content developed by the course instructor of record and spent a lot of time grading. In this class I'm expecting you to further develop your teaching skills by creating original course content as outlined on the next page - with my assistance, of course.

- Develop enhanced expertise relating to at least one propagation technique (ideally associated with your thesis or dissertation, though not required).

- Use enhanced expertise to create and evaluate content for a one period “lecture” to be delivered to advanced undergraduates in a “flipped” class format.

- Use enhanced expertise to develop and deliver a team-based problem-solving exercise to advanced undergraduates that will reinforce and build upon “lecture” content developed above.

- Use enhanced expertise to develop and deliver a laboratory exercise to advanced undergraduates that will reinforce and build upon the “lecture” and problem-solving exercise efforts above.

Final ~~Exam~~ Conversation (100 points):

My foundational goal for this course is to support your dare I say "joyful" learning throughout the semester and your ability to apply - and teach - what you've learned far into the future. I do not believe a high stakes final exam supports that goal.

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Rather I look forward to meeting with each of you at some point during finals week to discuss your experience in the class, what you've learned and how you anticipate applying what you've learned in the future.

As with the lab and capstone projects assigned to your undergraduate classmates, this "learning by teaching" effort - also known as the *protégé effect* - will complement the more traditional assessments in the class.