

BOTANY 305

Plant Morphology & Evolution

4 credits. Intermediate Lab Course. Biology Major Area D "Evolution and Systematics"

Professor: Dr. Ken Cameron (Professor)
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Teaching Assistant: Mr. Giovanni Giraldo, Ph.D. candidate (Botany)
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Location: B301-302 Birge Hall

Integrated Lectures: Tues/Thurs, 9:55-10:45am

& Labs: Tues/Thurs, 1:20-3:15pm or 3:30-5:25pm

Texts: Bell, A. 2008. Plant Form. Timber Press, Portland, OR. (hardcover; 431 pages). Retails for \$50. Available for \$25 (new) from instructor.

Gifford, E. M. & Foster, A. S. 1989. Morphology and Evolution of Vascular Plants. W. H. Freeman, New York. (out of print). pdf copies of chapters posted in Learn@UW

EVALUATION*

Take-Home Midterm Exam	15%	150 pts
4 In-Class Practical Exams	20% (5% each)	200 pts (50 pts each)
Research Proposal	7.5%	75 pts*
Proposal Peer Review	5%	50 pts
Research Paper	20%	200 pts
Research Presentation	10%	100 pts
Attendance & Class Participation	2.5%	25 pts*
		<u>800 pts Subtotal**</u>
Comprehensive Final Exam (optional)	20%	200 pts
		<u>1000 pts Total**</u>

** Note re: Final Exam. If you are happy with your performance on the last day of class, you may opt out of taking the final exam. In this case your grade will be computed out of 800 subtotal points only. If you choose to take the final exam, but do poorly, it will not be held against you. Your percentage based on subtotal points (out of 800) will be compared to your percentage based on total points, including the final exam (out of 1000). The higher of the two will be used to assign your final letter grade. In other words, taking the Final Exam can only help you to improve your grade – it's your choice!

GRADES

A	100-91%
AB	90-86%
B	85-81%
BC	80-76%
C	75-70%
D	69-60%
F	<60%

* Note: Graduate students enrolled in the course are required to lead an in-class discussion of a scientific paper in order to earn the full 25pts of Class Participation. See Dr. Cameron for scheduling this. Graduate student research proposals also must include at least five (not only two) primary literature references in order to earn the full 75 points.

SYLLABUS

Week One: G&F Chapters 1, 2, 3

T Jan 17 Introduction & History

Lab Tour of Botany Greenhouse

Th Jan 19 Plant Tissues

Lab Organ & Tissue Review; Microscopy; Description; Comparative Method

Week Two: Bell pp. 36-73 & 74-121

T Jan 24 Leaves 1

Lab Leaves

Th Jan 26 Leaves 2

Lab Scavenger Hunt in Greenhouses

Week Three: Bell pp. 122-141 & 142-169

T Jan 31 Roots

Lab Roots & Stems

Th Feb 2 Stems

Lab Leaves, Roots, & Stems: Quiz Bowl

Week Four: G&F Chapters 4, 5, 6

T Feb 7 Practical Exam 1

Lab Morphospace analysis – Dr. Ricardo Kriebel, Guest

Th Feb 9 Sporangia and Gametangia

Lab Scanning electron microscope training in Plant Imaging Center (PIC)

Week Five: reserve readings

T Feb 14 Hornworts & Liverworts

Lab Hornworts & Liverworts

Th Feb 16 Mosses / **Pass out Take-home Exam (due Feb 21)**

Lab Mosses

Week Six: G&F Chapter 9 pp. 105-125 & 125-153

T Feb 21 Clubmosses: *Lycopodium*

Lab Clubmosses

Th Feb 23 Spikemosses: *Selaginella*

Lab Spikemosses

Week Seven: G&F Chapter 9 pp. 153-173; & reserve readings

T Feb 28 Quillworts: *Isoetes* / **** Research Proposals Due ****

Lab Quillworts

Th Mar 2 Devonian fossils / **** Peer Reviews of Proposals Due ****

Lab *Prototaxites* fossil Debate

Week Eight: G&F: Chapter 8, Bell pp. 206-215 & 260-285

T Mar 7 **Practical Exam 2**

Lab Vegetative Reproduction

Th Mar 9 Whisk Ferns

Lab *Psilotum* & *Tmesipteris*

Week Nine: G&F Chapters 10, (11), 12

T Mar 14 Horsetails: *Equisetum*

Lab Horsetails

Th Mar 16 Eusporangiate ferns

Lab Ophioglossoid and Marattioid ferns

SPRING BREAK: Week of March 20

Week Ten: G&F Chapter 13

T Mar 28 Water ferns

Lab Water ferns: Marsiliales & Salviniiales

Th Mar 30 Leptosporangiate ferns

Lab Leptosporangiate ferns

Week Eleven: G&F Chapters (14 pp. 327-334), 15; & reserve readings

T Apr 4 Origin of Seeds; Cycads

Lab Cycads

Th Apr 6 **Practical Exam 3**

Lab Carboniferous fossils & coal balls

Week Twelve: G&F Chapter 16 & 17

T Apr 11 Ginkgoes

Lab *Ginkgo biloba*

Th Apr 13 Conifers

Lab Conifers

Week Thirteen: G&F Chapter 14, pp. 334-343; & reserve readings

T Apr 18 Gnetophytes

Lab Gnetophytes_: *Gnetum*, *Ephedra*, & *Welwitschia*

Th Apr 20 No lecture: work on research

Lab No lab: TA consultations available for research projects

Week Fourteen: G&F Chapters 18 & 19 pp.522-554; Bell pp.170-197

T Apr 25 Fossil Gymnosperms

Lab **** Research Presentations / Research Paper Due ****

Th Apr 27 Angiosperm Flowers

Lab Angiosperm Reproductive Morphology

Week Fifteen: G&F Chapter 20

T May 2 Angiosperms

Lab Angiosperm Life Cycle

Th May 4 **Practical Exam 4**

Lab Field Trip?

COMPREHENSIVE (but optional) FINAL EXAM: Monday, May 8 @ 2:45pm
