BOTANY 305

Plant Morphology & Evolution

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

Professor: Dr. Ken Cameron (Professor)
154 Birge Hall, Dept. of Botany
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Teaching Assistant: Mr. Giovanny 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


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*

800 pts Subtotal**

Comprehensive Final Exam (optional) 20% 200 pts

1000 pts Total**

** 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 & Salviniales

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