Biology 366, Spring 2015

Plant Systematics

Textbooks: Required: Clark *et al.* 2015 Plant Systematics: Laboratory Manual and Supplementary Resources

Simpson, M. 2010. *Plant Systematics (2nd edition)*

Recommended: Harris & Harris 1994 Plant Identification Terminology: An Illustrated Glossary

Judd, W. et al. 2008 Plant Systematics: A Phylogenetic Approach (3rd edition)

Zomlefer 1994 Flowering Plant Families

About the Lab:

Philosophy: An important part of the learning experience in this course is in the laboratory. This is where we will get the all-important "hands-on" experience with real plants (flowers!). In addition, the laboratory sections are designed to facilitate discussion, which should help solidify your understanding of the key concepts and terminology. Every effort will be made by the instructors to provide individual instruction and help for each student.

Supplies: Bring to lab this **course pack**, the Simpson 2010 textbook, and a **10X hand-lens**

Clothing: Appropriate shoes and clothing should be worn when field trips are scheduled.

Exams and Quizzes: Two exams and one final practical will be held during laboratory periods, and there will be a lecture final exam during finals week. Each exam will cover material as indicated in the syllabus but the final practical and the lecture final are cumulative. There will also be 6 quizzes, of which the best 5 will count toward your final score (i.e., 1 will be dropped). There will be one extra-credit opportunity in mid- to late April, weather permitting. **Make-up policy:** You must take examinations during their scheduled periods. Make-ups for exams will be allowed only if there are ***documented*** extenuating circumstances and you contact us prior to the test; make-ups may be in any format (written or oral). If you miss a quiz, that will be considered your low score and dropped; make-ups for a second missed quiz will be done under the same conditions as for exams.

Grades:

LEARNING EVALUATION	POINTS (% OF GRADE)
Exam I – Feb. 17-19	100 (10%)
Exam II – Mar. 31-Apr. 2	100 (10%)
Final practical – Apr. 28-30	125 (12.5%)
Final exam (lecture)	150 (15%)
Quizzes (best 5 of 6, 25 pts each)	125 (12.5%)
Exercises (lab and in-class)	200 (20%)
Lab participation (keyouts, etc.)	200 (20%)
TOTAL	1000 (100%)

Honesty: Group studying can be a very effective learning tool and students are encouraged to form study groups. However, exams, quizzes and outside assignments must be your own work and sources must be attributed as appropriate. Disciplinary action will be initiated in any suspected case of academic dishonesty.

Students with Disabilities: Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. All students requesting accommodations are required to meet with staff in Student Disability Resources (SDR) to establish eligibility. A Student Academic Accommodation Request (SAAR) form will be provided to eligible students. The provision of reasonable accommodations in this course will be arranged after timely delivery of the SAAR form to the instructor. Students are encouraged to deliver completed SAAR forms as early in the semester as possible. SDR, a unit in the Dean of Students Office, is located in room 1076, Student Services Building or online at www.dso.iastate.edu/dr/. Contact SDR by e-mail at disabilityresources@iastate.edu or by phone at 515-294-7220 for additional information.

Learning Resources Available to Biology 366 Students

• **Instructor –** The instructor is happy to answer (or try to answer!) your questions about any topics related to plant systematics and evolution. During the twice weekly lectures, you will have opportunities to see a wide range of information about plants, their classification, evolution, and the methods used to study them.

• **Your Teaching Assistant** – The strongest advocate for your individual success in Biology 366 is your TA. **It is absolutely imperative that you attend the lab sessions** and complete all required observations and answer questions posed at that time. Make good use of your time, and that of your TA, by being prepared for laboratory work by reading about what you are expected to accomplish in advance of coming to lab.

• **R. W. Pohl Conservatory** – An extensive living plant collection representing a range of flowering plant families is available in the R. W. Pohl Conservatory on the top floor of Bessey Hall. You are encouraged to use these collections for learning plant structures and families. The greenhouse is open from 9 a.m. to 5 p.m. Monday through Friday. Be aware that pesticide spraying often takes place on Wednesday or Friday afternoons, and that the greenhouse is closed at those times—please respect the warning signs. Access is by the elevator; press R for Roof.

• **Plant Systematics, 2nd Ed. Website** – The textbook has a companion website with materials accessible to students. These include all of the figures in the textbook. The link is: http://www.elsevierdirect.com/companions/9780123743800 (also printed opposite the title page of the book).

Biology 366, Spring 2015

Class Schedule

LAB DATE/ DAY	LABORATORY TOPIC	LECTURE DATE/DAY	LECTURE TOPIC	TEXTBOOK* READINGS
Week 1		Jan. 13 (T)	Course overview; The Wonderful World of Green Plant Diversity and Evolution	Ch. 1; Ch. 3: 55-62
Jan. 13-15	Plant diversity review/greenhouse tour			
		Jan. 15 (Th)	Vegetative parts of plants	Ch. 9: 452-468
Week 2		Jan. 20 (T)	Flowers	Ch. 9: 468-489
Jan. 20-22	Vegetative morphology & Flowers I (**Ex. I**); use of microscopes			
		Jan. 22 (Th)	Inflorescences; Fruits	Ch. 9: 489-494
Week 3		Jan. 27 (T)	Phylogenetic analysis, part I; **Quiz 1** (vegetative morphology & plant life cycle)	Ch. 2: 17-34
Jan. 27-29	Flowers II (**Ex. II**), Inflorescences & Fruits			
		Jan. 29 (Th)	Phylogenetic analysis, part II	Ch. 2: 40-48
Week 4		Feb. 3 (T)	Plant names; **Quiz 2** (flowers, inflorescences, fruits)	Ch. 15; Ch. 16
Feb. 3-5	Constructing keys (**Ex. III**); phylogenetic analysis (**Ex. IV**)			
		Feb. 5 (Th)	Gymnosperms; Angiosperm origins	Ch. 5; Ch. 6
Week 5		Feb. 10 (T)	ANITA grade and Magnoliids; **Quiz 3** (phylogenetics)	Ch. 7: 182-197

LAB DATE/ DAY	LABORATORY TOPIC	LECTURE DATE/DAY	LECTURE TOPIC	TEXTBOOK* READINGS
Feb. 10-12	Gymnosperms; ANITA grade; Magnoliids			
		Feb. 12 (Th)	Review for Exam I	
Week 6		Feb. 17 (T)	Monocots, part I	Ch. 7: 200-230
Feb. 17-19	**Exam I (covers through Feb. 3)**			
		Feb. 19 (Th)	Monocots, part II	Ch. 7: 230-264
Week 7		Feb. 24 (T)	Ceratophyllales, Basal eudicots, Caryophyllales	Ch. 7: 197-200; Ch. 8: 276-312
Feb. 24-26	Monocots			
		Feb. 26 (Th)	Systematics Resources; Rosids (Fabids)	Ch. 17; Ch. 18; Ch. 8: 312-347
Week 8		Mar. 3 (T)	Rosids (Fabids); **Quiz 4** (monocots)	Ch. 8: 312-347
Mar. 3-5	Ceratophyllales, Basal eudicots, Caryophyllales; Herbarium tour			
		Mar. 5 (Th)	Rosids (Malvids)	Ch. 8: 347-371
Week 9		Mar. 10 (T)	Plant Speciation	Ch. 13; Ch. 19
Mar. 10-12	Rosids			
		Mar. 12 (Th)	**No lecture**	
Mar. 16-20	**SPRING BREAK**		**SPRING BREAK**	
Week 10		Mar. 24 (T)	Plant Speciation cont'd.; **Quiz 5** (Rosids)	Ch. 19

LAB DATE/ DAY	LABORATORY TOPIC	LECTURE DATE/DAY	LECTURE TOPIC	TEXTBOOK* READINGS
Mar. 24-26	Plant Speciation (**Ex. V**)			
		Mar. 26 (Th)	Review for Exam II	
Week 11		Mar. 31 (T)	Basal Asterids; Asterids (Lamiids)	Ch. 8: 372-416
Mar. 31-Apr. 2	**Exam II (covers Feb. 5 through Mar. 5 plus Rosid lab, Gymnosperms—Rosids)**			
		Apr. 2 (Th)	Asterids (Campanulids)	Ch. 8: 389-416 and 416-435
Week 12		Apr. 7 (T)	**Special lecture/activity—TBA**	
Apr. 7-9	Asterids			
		Apr. 9 (Th)	Molecular Systematics	Ch. 14: 585-599
Week 13		Apr. 14 (T)	**Quiz 6** (Plant speciation; Asterids)	
Apr. 14-16	Molecular systematics (**Ex. VI**)			
		Apr. 16 (Th)	**Special lecture/activity—TBA**	
Week 14		Apr. 21 (T)	Nomenclature, Classification	Ch. 16; Ch. 2: 41-43
Apr. 21-23	Campus and local plants; review			
		Apr. 23 (Th)	Nomenclature, Classification (**Ex. VII**)	Ch. 16; Ch. 2: 41-43
Week 15		Apr. 28 (T)	Review for final practical	
Apr. 28-30	**Final practical (comprehensive)**			

LAB DATE/ DAY	LABORATORY TOPIC	LECTURE DATE/DAY	LECTURE TOPIC	TEXTBOOK* READINGS
		Apr. 30 (Th)	Review for lecture final	
		May 4 (M) 12:00-2 p.m.	**Final lecture exam (comprehensive)**	

***** Textbook: Simpson, M. G. (2010) *Plant Systematics, 2rd ed*. Academic Press, Elsevier Science and Technology Books, Burlington