



Instructor: Martin Dovčiak; E-mail: mdovciak@esf.edu; Phone: 470-6749
Office: 459 Illick; Office hours: F 2:00–4:00 PM, or by appointment

Teaching assistant: Juan Carlos Álvarez-Yépez; E-mail: jualvare@syr.edu; Phone: 470-6742
Office: 423 Illick; Office hours: Th 12:00-1:00 PM, or by appointment

Class times: Lecture: TuTh 11:00–11:55, Walter 210
Labs: W 1:50– 4:50 pm, Illick 238; Busses for field trips leave from Stadium Place.

Course website: <http://www.esf.edu/efb/dovciak/EFB535.htm>

Course description: The course develops conceptual understanding and practical identification skills that will further students’ appreciation of the diversity and evolution of flowering plants, including their ecological, economic and cultural significance. Half of the course topics cover major concepts in plant evolution and systematics, including plant morphology, pollination biology and reproduction, evolution of plant diversity, origins and phylogeny of flowering plants, introductory molecular systematics, and classification systems of flowering plants. The other half of the course topics, cover taxonomy and evolutionary relationships of important globally distributed flowering plant families, with a special emphasis on taxa that are ecologically important in the northeastern US and those with global economic or cultural significance. Selected taxa are examined in detail during lectures, field trips, and in laboratories to gain plant identification skills and appreciation of ecological and evolutionary significance (and beauty!) of plant forms and flower structures.

Course components & Grading:

- **Exams:** There are three exams covering material from *lectures, field trips, and laboratories*. The material discussed in this course builds upon itself and all exams will be cumulative.
- **Quizzes:** After a couple of weeks of orientation and practice, there will be weekly quizzes during field trips and laboratories, consisting of identification of specimens from families considered in the previous weeks. Quizzes are cumulative. The quiz with the worst score will be dropped.

- **Project (Plant collection or Plant presentation):**
 - i. **Plant collection:** Students will submit their own plant collection consisting of 15 pressed, dried, mounted, and labeled (by species and family) specimens of non-cultivated flowering plants from 15 different families covered in the course. Due in the last lab.
 - ii. **Plant presentation:** Students will give a PowerPoint presentation of ~5 minutes duration on the taxonomy, phylogeny, and/or ecology of a species selected from a family covered in the course.

Item	Percent
Exam 1	15
Exam 2	20
Exam 3	25
Quizzes (10)	20
Project	20
Total	100



Learning strategy: This is a challenging course that requires students to progressively assimilate complex botanical terminology into their scientific vocabulary and to use it to describe plant structure and function. Keeping up to date with the material from lectures and laboratories is essential. Laboratories are hands-on and enable students to work directly with plant samples and dichotomous keys to build their plant identification skills. The course requires accurate observation and recognition of repeating detailed patterns of plant characteristics. Active use of greenhouse collections, internet resources, and field observations ('botanizing') is encouraged. All course materials (including lecture slides and announcements) are made available via a course website on a weekly basis. Students are actively engaged in the course through class discussions and independent projects (by building their own plant collection or giving a presentation on a selected topic).

Course study materials:

- Gleason HA, Cronquist A. 1991. Manual of vascular plants of Northeastern United States and adjacent Canada. The New York Botanical Garden **(required lab manual & glossary of terms, \$74)**.
- Judd WJ, Campbell CS, Kellogg EA, Stevens PF, Donoghue MJ. 2007. Plant systematics. A phylogenetic approach. 3rd Edition. Sinauer **(not required but suggested background reading; \$68)**.
- Course website—primary literature, internet links, videoclips, and other materials **(required, free)**.
- Course slides, lab materials, and field trip notes/species lists **(required, \$40 field trip fee)**

Alternative study resources (not-required):

- Holmgren, NH. 1998. Illustrated companion to Gleason and Cronquist's Manual. Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden **(a "must have" for a serious botany student, \$125)**.
- Simpson MG. 2010. Plant Systematics. 2nd Edition. Elsevier/Academic Press.
- Woodland DW. 2009. Contemporary Plant Systematics. 4th Edition. Andrews University Press.
- Heywood VH, Brummitt RK, Culham A, Seberg O. 2007. Flowering Plant Families of the World. A Firefly book.
- Walters DR, Keil DJ, Murrell ZE. 2006. Vascular Plant Taxonomy. 5th Edition. Kendall/Hunt Publishing.
- Spears, P. 2006. A Tour of the Flowering Plants. Based on the Classification System of the Angiosperm Phylogeny Group. Missouri Botanical Garden Press.
- Spichiger R, Savolainen V, Figeat M, Perret M. 2004. Systematic botany of flowering plants. Science Publishers.
- Harris JG, Harris MW. 1997. Plant identification terminology. An illustrated glossary. 2nd edition. Spring Lake Publishing.
- Castner JL. 2005. Photographic atlas of botany and guide to plant identification. Feline Press.
- Mabberley DJ. 2008. Mabberley's Plant-book: a portable dictionary of plants, their classification and uses. 3rd Edition, Cambridge University Press.

Lecture & lab schedule[†]

Month	Day	Topic
August	30	1- Flowering Plants – Course Overview
	31	Lab 1- Intro to Field Trips, Labs, and Independent Projects
September	1	2- Nomenclature and Diversity in Plant Morphology 1
	6	3- Diversity in Plant Morphology 2
	7	Field Trip 1- Clark Reservation State Park
	8	4- ARCHAIC FLOWERING PLANTS: ANITA, MAGNOLIIDS, & BASAL EUDICOTS
	13	5- CORE EUDICOTS – CARYOPHYLLALES; DUE: Project Titles
	14	Field Trip 2- Green Lakes State Park; Quiz 1
	15	6- Diversity in Internal Plant Structures
	20	7- SAXIFRAGALES & ROSID CLADE – VITALES, GERANIALES, OXALIDALES
	21	Field Trip 3- Labrador Hollow Unique Area ; Quiz 2
	22	8- Origins of Angiosperms: Guest lecture by Dr. Fernando (SUNY ESF)
October	27	9- ROSID CLADE – MALPHIGIALES & FABALES
	28	Field Trip 4- Rand Tract/Webster Pond ; Quiz 3
	29	10- Diversity in Pollination & Dispersal (D. Attenborough, The Private Life of Plants)
	4	11- ROSID CLADE – ROSALES & CUCURBITALES
	5	Field Trip 5- South Campus; Quiz 4
	6	Exam 1
	11	12- ROSID CLADE – MYRTALES, BRASSICALES, MALVALES DUE: Presentation Titles
	12	Lab 2- specimen identification using dichotomous keys, no quiz
	13	13- The Evolution of Plant Diversity 1
	18	14- ASTERIDS-SYMPETALAE – ERICALES
November	20	Lab 3- specimen identification using dichotomous keys, Quiz 5
	20	15- The Evolution of Plant Diversity 2
	25	16- CORNALES & CORE ASTERIDS – SOLANALES
	26	Lab 4- specimen identification using dichotomous keys, Quiz 6
	27	17- Methods & Principles of Systematics 1
	1	18- CORE ASTERIDS – GENTIANALES & DIPSACALES
	2	Lab 5- specimen identification using dichotomous keys, Lab 4, Quiz 7
	3	19- Methods & Principles of Systematics 2
	8	20- CORE ASTERIDS – LAMIALES
	9	Lab 6- specimen identification using dichotomous keys, Quiz 8
December	10	Exam 2
	15	21- CORE ASTERIDS – APIALES & ASTERALES
	16	Lab 7- specimen identification using dichotomous keys, Quiz 9
	17	22- Polyploidy & hybridization in plant speciation. Guest lecture by Dr. Glennon (SU).
	21-25	Thanksgiving Recess (No Class)
	29	23- CORE ASTERIDS – ASTERALES cont., start MONOCOTS
	30	Lab 8- specimen identification using dichotomous keys, Quiz 10
	1	24- MONOCOTS — ALISMATALES, LILIALES, ASPARAGALES
	6	25- COMMELINOID MONOCOTS – POALES
	7	Lab 9- specimen identification using dichotomous keys, Quiz 11, Due: Final Projects
8	26- Featured plant presentations	
TBA	Final Exam (Exam 3)	

[†] Actual class schedule may vary somewhat from this template; updates will be provided via the course website.

List of plant families covered in the course by lecture week

Week 1: Course intro, morphology, no families covered in detail.

Week 2: Magnoliid Clade + Ranunculales (Basal Eudicots)

Aristolochiaceae, Ranunculaceae, Berberidaceae, Papaveraceae (including Fumariaceae)

Week 3: Caryophyllales (Core Eudicots)

Caryophyllaceae, Phytolaccaceae, Amaranthaceae, Portulacaceae, Polygonaceae
(Cactaceae, Droseraceae)

Week 4: Saxifragales (Core eudicots) & Vitales, Geraniales, Oxalidales (Rosids I)

Saxifragaceae, Grossulariaceae, Crassulaceae, Vitaceae, Geraniaceae, Oxalidaceae

Week 5: Malpighiales + Fabales (Rosid Clade)

Euphorbiaceae, Hypericaceae, Violaceae, Fabaceae (“Lemninosae”)

Week 6: Rosales + Cucurbitales (Rosid Clade)

Rosaceae, Urticaceae, Cucurbitaceae

Week 7 : Myrtales + Brassicales + Malvales (Rosid clade)

Lythraceae, Onagraceae, Brassicaceae, Malvaceae

Week 8: Ericales (Asterids=Sympetalae)

Ericaceae, Primulaceae, Polemoniaceae, Balsaminaceae, Saraceniaceae

Week 9: Cornales (Asterids=Sympetalae) + Solanales (Core Asterids)

Cornaceae, Solanaceae, Convolvulaceae, Boraginaceae

Week 10 : Gentianales + Dipsacales (Core Asterids)

Rubiaceae, Gentianaceae, Apocynaceae (including Asclepidaceae), Caprifolicaceae, Adoxaceae

Week 11: Lamiales (Core Asterids)

Oleaceae, Plantaginaceae (Scrophulariaceae), Orobanchaceae, Verbenaceae, Lamiaceae

Week 12: Apiales + Asterales (Core Asterids)

Apiaceae (“Umbelliferae”), Araliaceae, Campanulaceae, Asteraceae

Week 13: Thanksgiving Recess

Week 14: Alismatales + Liliales + Asparagales (Monocots)

Araceae, Alismataceae, Liliaceae, Iridaceae, Orchidaceae

Week 15: Commelinoid Monocots (Poales)

Typhaceae, Cyperaceae, Juncaceae, Poaceae