# GENERAL COURSE INFORMATION

**Lectures:** 2:00 to 2:50, Tuesday and Thrusday - LSII, Room 423
**Labs:** 3:00 to 4:50, Tuesday and Thrusday - LSII, Room 423

**Instructor**: Kurt Neubig
**Office**: Rm. 1004 LSIII
**Phone**: 618 453-3823
**Email**: kneubig@siu.edu
**Office Hours**: Just ask – we will arrange a time! I am generally available on MWF.
**Class webpage:** see D2L site for course information

**TA:** Nick Flowers
**Office:** Rm. 477 LSII
**Phone:** NA
**Email:** nickflowers@siu.edu
**Office hours:** Just ask – we will arrange a time!

**Required Texts**: Judd, W. S., C. S. Campbell, E. A. Kellogg, P. F. Stevens, & M. J. Donoghue. 2016. *Plant Systematics: A Phylogenetic Approach*. Fourth Edition. Sinauer Associates, Inc., Sunderland, MA.

Neubig, K. M. & Nickrent, D. L. 2016. Laboratory Manual for Elements of Plant Systematics. Purchase from the Printing Plant, 606 S. Illinois.

**Grades**: Your final grade will be determined from your performance on two lecture exams, a final and your grades from the laboratory. The actual number of points for each exam or quiz may vary slightly, however the percentage breakdown is as follows:

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|---|---|
| Lecture Exam I | = 15% |
| Lecture Exam II | = 15% |
| Final Exam (comprehensive w/ emphasis on last third) | = 20% |
| Lab Practical Lab. Exam I | = 10% |
| Lab Practical Lab. Exam II | = 10% |
| Lab Practical Lab. Exam III | = 10% |
| Class project | = 10% |
| Drawings and quizzes | = 10% |
| Total | = 100% |

Your final grade will be based on your total number of points with A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = < 60%, as well as an evaluation of overall class participation. If you know you will miss an exam, please make arrangements with me as soon as possible before, not after the exam. If you have three or more exams on one day during finals week, you can reschedule one of them. For review purposes, you are allowed to keep your graded lecture exams 1 & 2.

**Lectures:** All lectures (with links, images, etc.) are available from D2L, thus you can review these at any time. Your textbook comes with an online image resource that includes many of the photographs of vascular plants that you will see in lecture. You can view the website on any

computer using a web browser.

Attempts have been made to coordinate the lectures with the labs in this course, so usually you will have already been presented with an introduction to the lab material in that week's lectures. Your lab manual includes family summaries that will be discussed in lecture and your text contains line drawings that will also be discussed. You should bring both of these to lecture and lab. And of course, you should come to lecture and lab ***prepared*** by reading the appropriate chapter in your text and lab manual ***ahead of time***.

**Laboratory**: Half of the points possible are from the laboratory portion of this class, thus it is extremely important that you attend all the labs. It is difficult to provide the fresh lab material or give quizzes at later dates, but if you know you will miss a lab, please speak to me about making special arrangements. Lab exams involve living or preserved material. The final **lab exam** will be held during the final exam period.

**Class Project**. This will involve preparing a (digital) poster of a plant family NOT covered in this course. This will include several key features: 1) a phylogenetic tree that shows the position of this family in the order to which it belongs, 2) images of representative members of that family, 3) diagnostic and synapomorphic features that define the family, 4) diagnostic and synapomorphic features that are shared between the featured family of poster and other members of that order that we learned n the semester, and 5) what are critical gaps in the knowledge of that family. This is meant to be a **simple exercise** to expand your knowledge of plant families.

**Field Trips**: We will potentially take two Saturday field trips [this may include the **Little Grand Canyon** (Jackson County) and the **Missouri Botanical Garden**]. These trips are optional. The Little Grand Canyon field trip is an excellent opportunity to see beautiful spring wildflowers and to review families. At Missouri Botanical Garden we get a "behind the scenes" tour of the herbarium and library, something not available to the general public.

**Emergency Procedures**: Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency. Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

**LECTURE AND LAB SYLLABUS PLB 304 -- 2016**

| **Date** | **Lectures** (Chapter: Pages) | **Labs** |
|---|---|---|
| Week 1 | | |
| Tues 1/19 | 1. The Science of Plant Systematics (1:1-12) | Use of Microscopes |
| Thurs 1/21 | 2. Vegetative Morph. (4:53-61) | Vegetative Morph. 1 (Greenhouse) |
| Week 2 | | |
| Tues 1/26 | 3. Vegetative Morph. (4:53-61) | Vegetative Morph. 2 (Greenhouse) |
| Thurs 1/28 | 4. Dichotomous keys/winter botany | Keys (App. 2:557-560), Winter Botany 1 |
| Week 3 | | |
| Tues 2/2 | 5. History of Classification (3:39-52). | Winter Botany 2 |
| Thurs 2/4 | 6. Plant Nomenclature (App. 1:543-552) | Herbarium, Collecting (App. 2:553-557) |
| Week 4 | | |
| Tues 2/9 | 7. Methods of Systematics (2:13-38)* | Phylogenetics |
| Thurs 2/11 | 8. Plant relationships, early land plants | "Bryophytes" |
| Week 5 | | |
| Tues 2/16 | 9. Pteridophytes (8:185-206) | Pteridophytes |
| Thurs 2/18 | 10. Gymnosperms (8:206-224) | Gymnosperms |
| Week 6 | | |
| Tues 2/23 | 11. Orig. & phylo. angiosperms (7:175-181) | **Practical Lab Exam I (1/19 to 2/18)** |
| Thurs 2/25 | **Lecture Exam I (1/21 to 2/18)** | Inflorescences (4:72-74) (Lect. & Lab.) |
| Week 7 | | |
| Tues 3/1 | 12. Floral Morphology (4:61-67) | Floral Morphology (4:61-67) |
| Thurs 3/3 | 13. Floral Morphology II, Fruits | Fruits (4:75-79) |
| Week 8 | For angiosperm orders/families, see table 9.1 (pp. 230-231) for exact page numbers | |
| Tues 3/8 | 14. Early diverging angiosperms, Nymphaeales, Magnoliales, Laurales | Magnoliaceae, Annonaceae, Lauraceae |
| Thurs 3/10 | 15. Nymphaeales, Ranunculales | Berberidaceae, Ranunculaceae, Papaveraceae |
| Week 9 | | |
| **Sat. 3/12 to Sun. 3/20 Spring Vacation, no classes** | | |

* Chapter more detailed than I require. Responsible for what is presented in lecture.

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|---|---|---|
| Week 10 | | |
| Tues 3/22 | 16. Saxifragales | Crassulaceae, Hamamelidaceae, Saxifragaceae |
| Thurs 3/24 | 17. Malpighiales | Euphorbiaceae, Violaceae, Salicaceae |
| Week 11 | | |
| Tues 3/29 | 18. Fabales | Fabaceae (Mimosoideae, Caesalpinioideae, Faboideae) |
| Thurs 3/31 | 19.Rosales | **Practical Lab Exam II (2/23 to 3/30)** |
| Week 12 | | |
| Tues 4/5 | **Lecture Exam II (2/25 to 4/1)** | Rosaceae (4 subfamilies), Ulmaceae, Moraceae |
| Thurs 4/7 | 20. Fagales, Brassicales, Malvales Sapindales | Fagaceae, Brassicaceae, Malvaceae, Sapindaceae |
| Week 13 | | |
| Tues 4/12 | 21. Caryophyllales | Cactaceae, Caryophyllaceae Polygonaceae, Portulacaceae |
| Thurs 4/14 | 22. Cornales, Ericales | Cornaceae, Primulaceae, Ericaceae, Sarraceniaceae |
| Week 14 | | |
| Tues 4/19 | 23. Solanales, Gentianales | Solanaceae, Rubiaceae, Apocynaceae |
| Thurs 4/21 | 24. Lamiales | Lamiaceae, Plantaginaceae, Scrophulariaceae, Orobanchaceae |
| Week 15 | | |
| Tues 4/26 | 25. Apiales, Asterales | Apiaceae, Asteraceae |
| Thurs 4/28 | 26. Alismatales, Comelinales, Liliales Asparagales | Araceae, Alismataceae, Arecaceae Liliaceae s. lat., Amaryllidaceae |
| Week 16 | | |
| Tues 5/3 | 27. Asparagales, Poales | Orchidaceae, Iridaceae Juncaceae, Cyperaceae, Poaceae |
| Thurs 5/5 | 28. Angiosperm wrap up | **Project presentations!** |

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**Comprehensive Final Exam & Practical Lab Exam III - (emphasis on content covering last third of course 4/7 to 5/5)**

**Tuesday, May 10 at 2:45-4:45 p.m.**

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**Useful Web Pages**

- PhytoImages (SIUC): http://www.phytoimages.siu.edu/
- PlantSystematics.org (Cornell University): http://www.plantsystematics.org
- Digital Flowers (University of Illinois): http://www.life.uiuc.edu/plantbio/digitalflowers/

**Other Plant Systematics Textbooks**

Radford, A. E. 1986. Fundamentals of Plant Systematics. Harper & Row, New York, NY.

Simpson, M. G. 2006. Plant Systematics. Elsevier Academic Press, New York. 590 pp.

Walters, D. R. and D. J. Keil. 2006. Vascular Plant Taxonomy, Fifth Edition. Kendall/Hunt Publishing Co., Dubuque, Iowa. 608 pp. + index. Used as our textbook in previous years.

**General Taxonomic References**

Bailey, L. H. 1949. Manual of Cultivated Plants. MacMillan Publ. Co., New York, NY. 1116 pp.

Benson, L. 1959. Plant Classification. Heath Publ. 688 pp.

Cronquist, A. 1981. An Integrated System of Classification of Flowering Plants. Columbia Univ. Press, NY. 1262 pp.

Cronquist, A. 1988. The evolution and classification of flowering plants. New York Botanical Gardens, New York, NY. 555 pp.

Heywood, V. H. 1978. Flowering Plants of the World. Mayflower Books, New York, NY. 336 pp.

Hortus Third. A Concise Dictionary of Plants Cultivated in the United States and Canada. 1976. MacMillan Publ. Co., New York, NY. 1290 pp.

Mabberley, D. J. 2008. The Plant-Book, Third Edition. Cambridge Univ. Press. 1021 pp.

Radford, A. E., et al. 1981. Vascular Plant Systematics. Harper and Row. 891 pp.

Soltis, D. E., P. S. Soltis, P. K. Endress, and M. W. Chase. 2005. Phylogeny and Evolution of Angiosperms. Sinauer Associates Inc., Sunderland, MA.

Takhtajan, A. 1997. Diversity and Classification of Flowering Plants. Columbia University Press, NY. 643 pp.

Wood, C. E. 1974. A Student Atlas of Flowering Plants: Some Dicotyledons of Eastern North America. Harper and Row.

Zomlefer, W. B. 1994. Guide to Flowering Plant Families. University of North Carolina Press, Chapel Hill, NC. 424 pp.

**Local Floras**

Deam, C. C. 1940. Flora of Indiana. Dept. Conserv., Div. Forestry, Indianapolis, IN.

Fernald, M. L. 1970. Gray's Manual of Botany, Eighth Edition. D. Van Nostrand Co., New York. 1632 pp.

Gleason, H. A. and Cronquist, A. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada, Second Edition. New York Botanical Garden, N.Y. 910 pp.

Jones, G. N. 1963. Flora of Illinois. The University of Notre Dame Press, Notre Dame, Indiana. 401 pp.

Mohlenbrock, R. H. 1986. Guide to the Vascular Flora of Illinois. Southern Illinois University Press, Carbondale. 507 pp.

Mohlenbrock, R. H. 1970--x. The Illustrate Flora of Illinois. Southern Illinois University Press, Carbondale. Currently 21 vols. (7 second editions) on vascular plants are finished (project is ongoing).

Mohlenbrock, R. H. and D. M. Ladd. 1978. Distribution of Illinois Vascular Plants. Southern Illinois University Press, Carbondale.

Steyermark, J. 1963. Flora of Missouri. Iowa State Univ. Press, Ames, Iowa. 1728 pp.

Yatskievych, G. 1999. Steyermark's Flora of Missouri. Vol. 1. The Missouri Botanical Garden Press, St. Louis, MO. 991 pp.

Yatskievych, G. 2006. Steyermark's Flora of Missouri. Vol. 2 (Acanthaceae to Fabaceae). The Missouri Botanical Garden Press, St. Louis, MO.

Yatskievych, G. 2013. Steyermark's Flora of Missouri. Vol. 3 (Fabaceae to Zygophyllaceae). The Missouri Botanical Garden Press, St. Louis, MO.

## LABORATORY INFORMATION AND RULES

**Lab Meeting Time:** 3:00 to 4:50, Tuesday and Thursday - Room 423 LSII

**Instructor**: Kurt Neubig; Office: 1004 LSIII. Phone: 453-3823. Email: kneubig@siu.edu
Nick Flowers: Office: 477 LSII. Email: nickflowers@siu.edu

**Lab. Objectives**:

- To recognize by sight selected ferns, gymnosperms and angiosperms
- To understand the names and relationships of the various morphological structures seen during the laboratory
- To know and demonstrate proper dissection and drawing technique for plants
- To learn the family of the angiosperms dissected in the laboratory
- To be able to use a key to identify an unknown plant

**Lab Exams**: Three practical exams (10% each) will be given during the semester covering laboratory topics. These exams will consist of ca. 60 questions that relate to plants you have seen and dissected in lab. Instead of fresh material, high quality color photographs will be projected. You will be given sufficient time to answer each question.

**Lab Quizzes and Drawings.** Short quizzes may be given during some lab periods. These will be announced and will cover material seen in the previous lab. Most of the points that make up this part of your lab experience derive from you drawings.

**Class Projects.** 10% of your grade will be determined from your class project. This will involve preparing a (digital) poster of a plant family NOT covered in this course. This will include several key features: 1) a phylogenetic tree that shows the position of this family in the order to which it belongs, 2) images of representative members of that family, 3) diagnostic and synapomorphic features that define the family, 4) diagnostic and synapomorphic features that are shared between the featured family of poster and other members of that order that we learned n the semester, and 5) what are critical gaps in the knowledge of that family. This is meant to be a simple exercise to expand your knowledge of plant families. Much of the information can be gathered from a single website (http://www.mobot.org/mobot/research/apweb/) and some basic scientific literature searches. Presentations of these posters will be only 3 minutes long at the end of the semester. More information on this will be given later in the semester.

**Additional Purchases**: You will need to purchase and bring to lab:

- a drawing pencil (#2.5 is better than #2 which smudges!)
- paper (unruled) for drawings
- a 6" plastic ruler
- a hand lens (optional) is useful on field trips.

**Plant Material for Dissection**. Whenever possible, you will be provided fresh representatives of the various families for dissection. Some will be native plants found outside and some will come from the Plant Biology greenhouse. You are encouraged to visit the PLB greenhouse any time during business hours to review - and enjoy!

**Some Rules**: Laboratory attendance is required. Bench space should be left clean after every lab. Your dissecting tools and glass plates should be returned to the boxes after use - clean! Come prepared for lab by reading your text and lab manual.