

### Reading List and Preparation Instructions

#### Reading List

\*\*\*Manuscripts for essay questions are available at:

<http://dl.dropbox.com/u/9097267/PSreading.pdf>

#### **Basic botany, systematics, plant morphology**

##### **References:**

Raven, P.H., R.F. Evert & S.E. Eichhorn. 2005. *Biology of Plants*, 7<sup>th</sup> ed. W.H. Freeman and Company, New York, NY.

Judd, W.S, C.S. Campbell, E.A. Kellogg, P.F. Stevens & M.J. Donoghue. 2008. *Plant Systematics: A Phylogenetic Approach*, 3<sup>rd</sup> ed. Sinauer Associates, Sunderland, MA. **Chapters 1–7.**

##### **Systematics:**

Papers from which essay questions will be asked (manuscripts **will be provided** at the exam):

1. Colin Hughes and Ruth Eastwood (2006). Island radiation on a continental scale: Exceptional rates of plant diversification after uplift of the Andes. *PNAS* 103(27): 10334–10339.
2. Darren M. Crayn, Klaus Winter, and J. Andrew C. Smith (2004). Multiple origins of crassulacean acid metabolism and the epiphytic habit in the Neotropical family Bromeliaceae. *PNAS* 101(10): 3703–3708.

##### **Plant morphology:**

Papers from which essay questions will be asked (manuscripts **will be provided** at the exam):

3. Ryoko Imaichi and Masahiro Kato (1991). Developmental study of branched rhizophores in three *Selaginella* species. *American Journal of Botany* 78(12): 1694–1703.
4. Tracy McLellan (1993). The roles of heterochrony and heteroblasty in the diversification of leaf shapes in *Begonia dregei* (Begoniaceae). *American Journal of Botany* 80(7): 796–804.

##### **Paleobotany:**

Papers from which essay questions will be asked (manuscripts **will be provided** at the exam):

5. Gar W. Rothwell and Kevin C. Nixon (2006). How does the inclusion of fossil data change our conclusions about the phylogenetic history of Euphyllophytes? *Int. J. Plant Sci.* 167(3): 737–749.
6. Paul Kenrick and Peter R. Crane (1991). Water-conducting cells in early fossil

land plants: Implications for the early evolution of tracheophytes. *Bot. Gaz.* 152(3): 335–356.

### **Biostatistics:**

Papers from which essay questions will be asked (manuscripts ***will be provided*** at the exam):

7. Katz DSW, Lovett GM, Canham CD, O'Reilly CM (2010) Legacies of land use history diminish over 22 years in a forest in southeastern New York. *Journal Torrey Botanical Society* 137: 236-251
8. Marshall JM, Buckley DS, Franklin JA (2009) Competitive interaction between *Microstegium vimineum* and first-year seedlings of three central hardwoods. *Journal Torrey Botanical Society* 136: 342–349

### **Plant Physiology:**

**Reference:** Plant Physiology, 4<sup>th</sup> ed. Taiz and Zeiger, 2006 (Chapters 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 26)

Papers from which essay questions will be asked (manuscripts ***will be provided*** at the exam):

9. Ramiro E. Rodriguez, Anabella Lodeyro, Hugo O. Poli, Matias Zurbriggen, Martin Peisker, Javier F. Palatnik, Vanesa B. Tognetti, Henning Tschiersch, Mohammad-Reza Hajirezaei, Estela M. Valle, and Néstor Carrillo. 2006. Transgenic Tobacco Plants Overexpressing Chloroplastic Ferredoxin-NADP(H) Reductase Display Normal Rates of Photosynthesis and Increased Tolerance to Oxidative Stress. *Plant Physiol.* 143: 639-649.
10. Wei Wei Chen, Jian Li Yang, Cheng Qin, Chong Wei Jin, Ji Hao Mo, Ting Ye and Shao Jian Zheng. 2010. Nitric Oxide Acts Downstream of Auxin to Trigger Root Ferric-Chelate Reductase Activity in Response to Iron Deficiency in *Arabidopsis*. *Plant Physiology* 154:810-819.

### **Phytochemistry:**

**Reference:** Dewick, Paul M. 2002. Medicinal natural products: a biosynthetic approach. Second Ed., John Wiley and Sons, NY.

Papers from which essay questions will be asked (manuscripts ***will be provided*** at the exam):

11. B U Jaki, SG Franzblau, LR Chadwick, DC Lankin, F Zhang, Y Wang, GF Pauli (2008) Purity-activity relationships of natural products: The case of anti-TB active ursolic acid. *J. Nat. Prod.*, 71: 1742-1748
12. SE Geller, LP Shulman, RB van Breemen, S Banuvar, Y Zhou, G Epstein, S Hedayat, D Nikolic, EC Krause, CE Piersen, JL Bolton, GF Pauli, NR Farnsworth (2009) Safety and efficacy of black cohosh and red clover for the management of vasomotor symptoms: a randomized controlled trial. *Menopause*, 16: 1156-1166.

### Preparation for the exam

The exam will be given on one day and consist of three sections (700 points). Session I (100 points) must be handed in before the start of the exam in both electronic and hard copy. Sessions II and III (each 300 points) will draw from the reading list above. Students must pass with a minimum of 70% or 490 points.

### SESSION I. ESSAY to submit before the morning session. (TOTAL 100 points)

**Instructions:** Submit the Session I essay in hard copy and in electronic form as a PDF file. Do not put your name on either, use your student number for filename and for marking the hard copy. Make sure that in “properties” there is no notation of “author”.

Present a subject, problem, hypothesis, theory, or controversy you consider important to plant sciences. **The essay must be hypothesis driven.** The essay should show relevance across the botanical subdisciplines. The essay should be both a review and a synthesis and demonstrate the level of scholarship, criticism, and independent thinking we require at the doctoral level. Your topic may be a large or a small one; broad or highly specialized; and you must communicate how the chosen topic is relevant to a major concept. We wish to measure the ability to understand and to synthesize information and ideas from more than one discipline of biology.

The paper should have a title and begin with a **one paragraph abstract/summary which includes your hypothesis** (hypothesis sentence should be in *italics* and include the word “hypothesis”). The paper should be paginated and written with 11 pt. Arial or equivalent font, one-inch margins, and a **maximum of five (5) pages of double spaced text** followed by a minimum of 15 (complete) literature citations provided in the format required by the journal, *Plant Physiology* (see: <http://www.plantphysiol.org/misc/ifora.shtml>).

Following the literature citation section, provide the names (from faculty in the CUNY Biology PhD program) of two potential “reviewers” along with their areas of expertise which you feel make them appropriate to reviewers of your manuscript.

*Note: an essay based largely on the published work or grant proposals of faculty staff members or scientists at other institutions is not acceptable. The essay must be your own idea and not the product of a collaborative effort. Faculty should not be consulted in development of your essay.*

### SESSION II. MORNING (TOTAL 300 points)

#### Instructions:

A- Answer basic botany definitions **Choose 10 questions. 5 points each.**  
50 points total)

B- Answer short answer botany questions (100 points) **Choose 5 questions. 10 points each.** 50 points total)

C- For your exam, **choose 5 out of 6 subject areas (PLANT SYSTEMATICS, PLANT MORPHOLOGY, PALEOBOTANY, BIOSTATISTICS, PLANT PHYSIOLOGY,**

**PHYTOCHEMISTRY**) and answer only one essay per subject area. You will complete **two** essays in the morning session (200 points) and **three** essays in the afternoon session (300 points). Each essay is worth 100 points for a total of 500 points for the essays.

**SESSION III. AFTERNOON (TOTAL 300 points)**

**Instructions:** Of the remaining essay subject areas, choose three subjects (three essays) to complete.